Planning from “Table to Dump”: Analyzing the Practice of Household Food Consumption and Food Waste in Urban Indonesia

by

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A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy

Department of Geography and Planning
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Abstract

By analyzing the ways in which diverse households shop, cook, consume, and waste, this dissertation reveals the complex relationship between space, class, and social relations in the generation of household food waste in Indonesia. Several themes are explored in four empirical chapters. First, a food waste regime conceptual framework is employed to better understand unequal power relations between “modern” food provisioning infrastructures such as supermarkets, and traditional food provisioning infrastructures, specifically in relation to space restriction and predatory pricing. Secondly, the food waste regime framework is also applied to examine the role of class and privilege in determining an individual’s ability to define “what is food and what is waste” within the boundaries of the household. Thirdly, the application of the conceptual framework of “distancing” articulates the role of urbanization in the spatial and mental distancing of both the food supply chain and waste management infrastructure. Finally, from a statistical perspective, the dissertation examines whether income level and where people choose to shop (for example, the type of retail) impact the amount of household food waste generated in Indonesia. Using practice theory, planners are encouraged to take a closer look at different types of retail formats to understand how space may impact consumption.
This study draws upon a qualitative study of 21 upper (n=7), middle (n=7) and lower (n=7) income households in Bogor, 12 key informant interviews with government officials, traditional food vendors, supermarket managers, and a waste collector, as well as the result of a quantitative study on 323 households. To conclude, this dissertation argues that there is a need to offer infrastructural support that can protect traditional food retail and promote more sustainable food waste management. Furthermore, considerations for social and environmental justice are key in the search for a systemic and dignified solution to the issue of food waste in Indonesia.
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Dedicated to my late nephew Arfan Soma Azhar (October 20th 2010-January 20th 2014)

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Glossary

**Food loss** refers to the decrease in edible food mass throughout the part of the supply chain that specifically leads to edible food for human consumption. Food losses take place at production, postharvest and processing stages in the food supply chain (Parfitt et al., 2010).

**Food waste**
Any discarded organic matter that was intended for consumption by humans, regardless of its ultimate fate. In other words, food is wasted when it does not fulfil its original purpose of providing human nourishment, regardless of whether it is composted, anaerobically digested, landfilled or incinerated (Soma & Lee, 2016). Food waste occurs at the end of the food chain (retail and final consumption) and is usually associated with retailers’ and consumers’ behavior. (Parfitt et al., 2010).

**Hypermarkets:** Generally called a “big box store,” this retail model combines a supermarket (offering food) with a department store model (offering non-food items such as clothing, furniture etc.).

**Kampung:** village (can refer to both an urban or rural village). In this study, Kampung primarily refers to an urban informal/ unplanned village.

**Kelurahan:** the lowest government administrative level, also known as administrative village led by a civil servant appointed by the local government’s city or regency.

**Leftover Food:** While leftover food may be considered surplus food, in the context of this study, this term refers to a category whereby food remains after the rest of the food has been consumed or used.

**Mobile Vegetable Vendor (tukang sayur):** vegetable vendor who travels around the neighbourhoods and sells food (mostly fresh produce) on pushcarts and or motorcycles.

**Minimarkets:** Similar to a convenience store (7/11), also called mini marts. The store offers a range of everyday items. In the context of this study, it differs from traditional warungs as it is part of a franchise instead of being independent.

**Rukun Tetangga (RT):** The lowest neighbourhood level administration consisting of a number of households led on a voluntary basis by a Rukun Tetangga (RT) leader who is elected by residents within the household boundary.

**Rukun Warga (RW):** Neighbourhood level administration that is one level higher than Rukun Tetangga (RT). RW is based on a cluster of neighbourhoods and is led by a Rukun Warga who is elected by the residents.

**Surplus Food:** In this study, surplus food is meant to convey an amount of food that is greater than what is needed by and or excess food but have not been consumed by the household.
**Supermarkets**: self-serving store with a wide array of food and household products (smaller than a hypermarket). Modern supermarkets and hypermarkets are interchangeable as the franchise mentioned offers both model.

**Street Vendor** *(pedagang kaki lima)*: street vendors may include sellers of food (usually prepared/ready to eat foods) and wares. In this study is used to refer to vendors who sell foods on carts.

**Traditional Wet market** *(pasar)*: traditional market selling fresh produce, fruits and meat (in some cases in the form of an open-air market).

**Warung**: a small mom and pop (neighbourhood-based) shop selling a small amount of fresh foods, beverage, some dry goods such as snacks, and a limited amount of household needs such as soap.

**Waste pickers**: informal waste collectors who seeks re-saleable items such as plastic bottles, metal or edible foods.
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Chapter 1: Introduction

If we don’t see the garbage of our culture, both literally and metaphorically, then we are not confronting the reality of what that garbage actually says about us.” (Mohsen Mostafavi, 2010)

1.0 Research Objective

According to Mostafavi (co-author of Ecological Urbanism), “If we don’t see the garbage of our culture, both literally and metaphorically, then we are not confronting the reality of what that garbage actually says about us” (2010, 9). In this quote, Mostafavi reflects on the environmental project of tracing, following, and investigating rubbish to better understand both “who we are” as a society and “what are we doing to ourselves” (2010,9). However, the concept of rubbish is fraught with ambiguity in that there are issues of power behind the process of assigning objects -or in the case of this study, food matters- into categories of waste. My research on food waste in Indonesia is an homage to Mostafavi’s environmental project. This dissertation is an investigation of the transformation of the food system, the infrastructures of food provisioning, the various global forces (urbanization, globalization and market liberalization) and the resulting consumption practices that have led to the generation of massive amounts of food waste and environmental damage in Bogor, Indonesia amidst food insecurity. This research investigation is a critical component of my research interests as a food systems planner, a planner (both academically and professionally) who integrates food systems considerations into planning practice, research and decision making (Soma and Wakefield, 2011). As Pothukuchi and Kaufman (2000) argue, for planners to be truly concerned about improving human settlements, they need to incorporate food issues into their working models. The elements of the food system that planners should consider include the “chain of activities connecting food production, processing, distribution, consumption, and waste management, as well as all of the associated regulatory institutions and activities” (Pothukuchi and Kaufman, 2000, 113).

Despite the seminal work by Pothukuchi and Kaufman (2000) and the growth of literature on food
system planning (American Planning Association, 2007; Raja, Born & Kozlowski-Russell, 2008; Soma and Wakefield, 2011) the issue of food waste is largely missing in urban and environmental planning literature. This dissertation contributes to the planning literature by moving the discussion from production (“Farm to Table”) to include consideration for waste management (“Table to Dump”). It is the first study to investigate urban household food consumption and food wasting practices in Asia and more specifically, Indonesia.

The main objective of this dissertation is to investigate the ways in which diverse urban households consume food and waste food in Indonesia. More specifically, it seeks to challenge the assumption in dominant food waste literature that consumer food waste is not an issue in developing countries. With increasing urbanization in Indonesia, a growing population and poor waste infrastructure, there is an urgent need to address the issue of food waste. This dissertation also uncovers a narrative of resilience and innovation despite collapsing food and waste infrastructures that have led to food insecurity, food waste explosions and fatal landfill slides. To address these urban inequalities, the study calls for social justice considerations at every level of the food supply chain, going beyond the farm gate to include the management of household food waste. This dissertation contributes to the planning discipline as it is concerned with improving human settlements by integrating food systems into planning considerations in Indonesia. Focusing on the case of Bogor, Indonesia, this research critically investigates the following research question: How do urban households with diverse economic backgrounds consume and waste food? The study also includes the following sub-questions:

1. How is food waste being managed at the household level?

2. How do social, material (built environment) and cultural factors influence food consumption and food wasting practices?
3. How can my findings be used by urban planners to develop minimization and prevention strategies to reduce the generation of household food waste in Indonesia?

1.1 Research Context

Values around food and wasting and the system of food production have changed significantly in the past century. The differences in values can also be compared inter-generationally and between cultures. Hitherto, the definition of food waste and ‘who gets to define what is not food and waste’ has been determined primarily by Eurocentric-based studies and reports (Shilling, 2013). As cultural, social and class relations impact what is categorized as food and as waste, it is critical to unpack the assumptions and contribute to the study of food waste from a Global South perspective where values have been changing just as much as they have been changing in the Global North.

From an intergenerational standpoint, Quested et al. (2013) found that the population of people in the U.K over the age 65 waste measurably less (approximately 25% less) when compared to the rest of the population with the household size is controlled. This group of over 65s in the U.K. did not waste less due to environmental concerns, rather, focus groups found that this particular group view wasting food and “wastefulness” in general as wrong (WRAP, 2007; Quested et al., 2013). A hypothesis to explain this observation is that the population over 65 have endured austerity and food rationing during the World War II, they were also educated in more traditional teaching on cooking and food management (Quested et al., 2013). Indeed, this observation is corroborated by Evans, Campbell and Murcott (2013) as they found that food waste was visible in the mid-nineteenth to the mid-twentieth century, notably from the constant messaging in print such as cookbooks, media and in war slogans such as “Food is Ammunition. Don’t waste it” (Evans, Campbell and Murcott, 2013, 13). Cookbooks at the time were replete with recipes for re-making leftovers, using cold remains and messages such as, “great care is to be taken so that nothing that could be used is thrown away or suffered to be wasted in the kitchen” (Beeton, c.1925, 293). However,
the concept of thrift, frugality, prudence, and ideas connecting virtue to wasting less generally faded after
the end of the Second World War as farmers were pushed to produce maximum amounts of food, incomes
rose, refrigerator ownership grew and a new regime of excess food in the 1950s was established (Evans,
Campbell and Murcott, 2013, 13). As Evans, Campbell and Murcott state, “[i]n a world of excessive and
cheap food, it is not difficult to imagine frugality and careful household management offering a poor fit
with the ‘zeitgeist’ of the Cold War Food Regime” (2013, 15). In the context of cultural and economic
transitions, it is important to understand the transformations of food consumption and wasting. In
Indonesia, for example, the 1990s market liberalization that resulted in the rise of the “supermarket
revolution” under Soeharto’s New Order, had a profound effect on rapid urbanization and food
consumption patterns.

The complexity of the industrial food system and the role of a globalized food regime in the
generation of food waste in Indonesia cannot be underestimated. According to the food waste regime
framework, Gille argues that food waste is produced through ‘risks’, namely, that the ‘unequal
organization of uncertainty is a key structural determinant of food waste production’ (2013, 31). Those
faced with uncertainty and without the power or choice to avoid the risk of consuming food waste bear
the greatest burden. In a global context, the industrial corporate food regime is responsible for reducing
food into commodities and reducing the self-sufficiency of both peasants (Peluso, Affif and Rachman,
2008; McMichael, 2008) and the Indonesian public in general. This dissertation takes into account that
the current paradoxical state, whereby massive amounts of food is wasted amidst global hunger, or where
starvation exists amidst plenty, is premised upon an extremely unjust food system. From a micro-level,
unequal social relationships relating to food consumption and production can be replicated at the
household level and have a ripple effect on the broader society. Therefore, the macro-level historical,
political, economic and contextual background cannot and should not be divorced from scholarly attempts to understand the everyday practices (micro-level) of household food consumption and wasting.

A key analysis in this dissertation is understanding the processes of food procurement or obtaining food while integrating analyses of class and unequal access to the market and to food. Issues of class are absent from most food waste literature (Ganglbauer et al., 2013; Williams et al., 2013; Evans, 2014; Stefan et al., 2013) but are well established in the food security and food justice literature (Tarasuk and Loopstra, 2013; Alkon and Agyeman, 2011). Class is an important factor driving certain types of consumption of the ‘profligate’ nature, especially in industrialising and modernising countries with extreme income disparity such as Indonesia. However, space is also an important component of consumption as it plays a role in where and how people shop, where people work, which further influences the types of foods that people consume and waste.

This thesis also explores the role of the market in the form of diverse retail spaces (both modern and traditional) and its role in shaping consumption patterns. As Coles and Hallet IV argue, the market plays an important role in shaping food consumption and food wasting:

Markets are sites where market-relations define the use and exchange value of objects; they are effectively where, amongst other things, objects become commodities and where commodities are consumed. As places, markets actively obscure the geographic relations that bring objects into their midst and they disavow an understanding of the processes that send objects away. (Coles and Hallet IV, 2013,170)

Class is connected to the market and informs spatial considerations as it influences people’s access to food (supermarkets, traditional wet markets, convenience stores) and waste infrastructures (waste collection, dumpsite, community waste facility, a yard). It follows that access to food provisioning and waste infrastructures, particularly in developing countries, can create either inclusivism or exclusivism by either empowering certain classes of people with choices, or controlling who gets to access these spaces (Martin, 2014). Social class on the other hand differs in that the embodiment of social class gives rise to
preferences, practices, ritual and routines that connect food practices to individual and collective identities (Bourdieu 1984; Johnston et al. 2012; Mennell 1985 as cited in Maguire, 2016).

Another context that should be considered in a study of food wasting in Indonesia is the growing middle-class population and the transformation of their food consumption patterns. Highly consumptive lifestyles that are generally attributed to Western consumers also exist in Asian countries, including in lower income Asian countries (Hobson, 2004; Leichenko & Solecki, 2005; Arai, 2001; as cited in Lee and Soma, 2016). According to Kharas (2017), at the end of 2016, there were 3.2 billion people in the middle-class group. In addition, 140 million people join the middle-class group annually with an overwhelming majority (88%) of the middle-class population living in Asia.

The definition of the term middle class is extremely varied. The term “middle class” in an Indonesian context can be used to identify a group of people that are distinct from an upper class having feudal origins, holding power and wealth by virtue of birth and in contrast to a lower class of peasants/workers that lack power, wealth and education (Dick, 1985). In the global South, the middle-class population tends to live in neighbourhoods in which modern supermarkets and department stores have replaced traditional wet markets and small shops (Hughes & Woldekidan, 1994). For Robinson & Goodman (1996), who coined the term “The New Rich in Asia”, the term is utilized generally to refer to the new wealthy social groups that have emerged from industrial change in Asia during the past two decades prior to 1996.

In general, the middle-class group in Indonesia has income that is well above poverty lines and has recognizable social, cultural, political as well as economic characteristics (Hughes & Woldekidan, 1994). The consumer revolution catalyzed by the “new rich” in Indonesia is reflected in obesity trends being on the rise in Indonesia. According to Roemling and Qaim, “Indonesia is in the process of a fast and profound nutrition transition, with constantly rising obesity rates” (2012, 1009). Obesity is especially
pronounced among the female population in Indonesia and rising obesity is not only confined to urban and relatively richer households but is also increasingly observed in rural areas and the low-income population (Roemling and Qaim, 2012, 1009). With the change in food provisioning infrastructures, supermarket revolution, nutrition transition, and a crumbling waste infrastructure (Meidiana and Gamse, 2011), it is clear that a systemic intervention is necessary to address the issue of food waste in Indonesia.
1.2 The Case Study: Bogor Indonesia

This study took place in the City of Bogor, in the province of West Java, Indonesia, a city with a population of 1,030,720 people (Statistics Bogor City, 2014). Bogor is located approximately 60 kilometers south of Jakarta and is part of the Greater Jakarta (JABODETABEK- Jakarta, Bogor, Depok, Tangerang, Bekasi) region (see Figure 1). Due to urbanization and proximity to Jakarta, Bogor is also considered a bedroom community (kota tidur) and has experienced rapid population growth and development.

Figure 1: Map of Bogor, West Java and Indonesia

Figure 1: Map of Indonesia, West Java and the City of Bogor. Map created by Asya Bidordinova. (See Appendix E for data sources)
Bogor’s urban centre is extremely dense with several hundred thousand people living in an area of approximately 20 km\(^2\). Bogor City is part of the Bogor Regency and is a municipality divided into six districts (kecamatan). Due to sprawl and the growing population, in 2010, the planning department embarked on vertical growth and Bogor’s skyline now includes many high-rise apartment buildings. Due to the high cost of land in Bogor, real estate development has sprawled into the peripheries, consuming prime agricultural land. Decentralization and the deregulation of investments in Indonesia have also led to the proliferation of elite residential enclaves spreading rapidly since the late 1990s (Kenichiro, 2001).

Analysis of food waste in Indonesia is especially urgent as food waste in urban areas of Indonesia is projected to grow by 49% between 2005 and 2025 (Adhikari, Barrington and Martinez, 2006). The Bogor district is part of the Jakarta Greater Area megacity and is impacted by a “spillover” sprawl effect due to its close proximity and relative affordability in comparison to the capital city (Andriamasari, 2015). According to the 2013 agricultural census, the agriculture sector in Bogor decreased by 19.89 percent from 2003 to 2013 (Andriamasari, 2015) with 47,953 hectares of land converted into urban development (Fajarini, 2014). Facing land scarcity and the augmentation of urban development, residents of Bogor are increasingly reliant upon uneven and deficient waste collection. In low to middle-income countries, food waste represents 50% to 80% of the municipal solid waste stream (Adhikari et al, 2006; Achankeng, 2003). This is true in the case of Bogor where food waste comprises 69% of the total solid waste collected (Municipality of Bogor, 2011).

Currently, there is no official composting program nor is there a mandate by the city to source separate organic waste from inorganic waste. However, a pilot program to test recycling and composting officially commenced in 13 neighbourhoods in 2011. In other areas outside the pilot, waste is often mixed, contaminated and is therefore very difficult to sort. Out of the 68% of the total amount of daily waste (1457 m\(^3\)/day) that is collected by the municipality, only 6.9% (100 m\(^3\)) is composted (Municipality of
Decomposing food waste that is uncollected can be found in rivers, street corners, sewers, and generates methane and leachate that pollutes groundwater as well as microbes, insects and rats (Adhikari et al., 2006; Medina, 2002). Pollution, especially solid waste, has increased with rapid urbanization and approximately 15% to 40% of the waste is not collected in Indonesia (Dethier, 2017).

Waste collection reaches only 67% of the city and is not accessible to all Bogor residents (Municipality of Bogor, 2011). According to the city’s most recent collected data (in 2007), the composition of Bogor’s solid waste consists of 69% food waste, 13% plastic, and other waste including metal, paper etc (personal communication with Head of Waste and Sanitation, 2014).

The Galuga landfill, (Tempat Pembuangan Akhir [TPA]), located approximately 23.7 km from the city centre, is the City of Bogor’s only landfill and operates as an open dump that handles mixed waste. Unlike sanitary landfills, open dumps are not controlled and are not environmentally managed to deal with leachate or methane gas emission. The Galuga open dump reached its capacity in 2005. However, despite being critically over capacity, the dumpsite was still being used in 2016. It has been a site of numerous landslides which has resulted in fatalities as well as burying a nearby local rice paddy (Priliawito, 2010).

According to the Indonesian National Standard (SNI) of waste management, it is the responsibility of residents (by paying for either private or informal collection) to get their household waste to the designated “Temporary Dump Site” Tempat Pembuangan Sementara (TPS) usually located at a neighbourhood level. Unfortunately, a neighbourhood may not be located near a designated TPS, and in some cases, there are none available. Since awareness of waste management is low and the waste infrastructure is lacking, many people dispose of waste in empty plots of land, on streets, and in sewers. Bogor’s, densely populated urban centre, lack of waste infrastructure, and extreme income disparity are characteristics common to other countries in the global South.
1.3 Dissertation Format

Unlike the more conventional manuscript - usually prepared in the format of a monograph - this dissertation is based on the “three paper” thesis (multi-paper model). In this dissertation, I include four empirical chapters. Two of the papers have been published as journal articles (Chapters 4 and 5), one is forthcoming in an academic journal (Chapter 3) and the fourth paper (Chapter 6) is in preparation for submission. There are certain limitations due to the multi-paper model of the thesis. This includes some repetition of the research context which will be encountered in the empirical chapters. However, I have tried to minimize repetition by restructuring the chapters, moving the overall methodology for the thesis to chapter two, and moving introductory pieces such as research context into the Introduction section. Limitations are also caused by the word count necessary to accommodate diverse journal requirements. Despite said limitations, I believe that the independent empirical chapters effectively represent the diverse angles and complexity of the topic while connecting the broader linkages from the findings into a holistic thesis.

This dissertation is based on the findings from a mixed methods study conducted in two phases between May 2014 to August 2014 and July 2015 to October 2015 in Bogor Indonesia. The quantitative study included the dissemination of a household food consumption and food waste questionnaires to 323 households. The qualitative component of the study included an immersed study of 21 households categorized into three income groups. The study employed ethnographic techniques such as participant observation in the house and in the community, going along to shops, observation during cooking and mealtimes and in-depth repeated semi-structured interviews. In addition to the household study, semi-structured interviews were conducted with 12 key informant interviews of professionals and informal workers in the food and solid waste sectors.

My dissertation includes an introductory chapter outlining the dissertation format and research context. The introductory chapter is followed by a chapter on methodology and positionality, as well as
four additional chapters based on four journal length articles addressing different angles of the research and utilizing different theories. Three of the empirical chapters (Chapters 3, 4 and 5) have been accepted for publications in peer reviewed journals and an additional paper (Chapter 6, a quantitative paper surveying household food waste) is under preparation for submission. All of the papers are sole-authored. The final chapter concludes the thesis by providing an overview of the theoretical contributions, identifying recommendations, the limitations of the research, as well as presenting a call for future research.

1.4 Summary of Chapters

Chapter 2: Methodology

In the second chapter I outline the methodology used in this dissertation and my positionality as a researcher born and raised in Indonesia with the entirety of my post-secondary education completed in Western academic institutions. This insider-outsider position provided me with a broader perspective with respect to the ways in which I analyzed the phenomenon of household food waste in Bogor, Indonesia. My positionality as a Western educated Indonesian-Canadian studying household food waste and consumption is fraught with tension, especially with regards to issues around food gifting between upper classes, the sharing of leftovers from upper-income to lower income households, expectations around gender roles in the household, and the employer and domestic helper relationship. In this chapter, I outline several examples wherein the movement and categorization of food and waste become loaded issues when viewed from my insider-outsider perspective.

My research consisted of a mixed methods study including a qualitative phase utilizing the following ethnographic approaches: participant observation, “going-along” (Kusenbach, 2003) on shopping trips, multiple in-depth semi-structured interviews with households of various incomes, and key informant interviews with representatives of the planning and waste departments, retailers, mobile
vendors, waste collectors and neighbourhood leaders. During the quantitative component of the study, I administered questionnaires and conducted household surveys totaling 323 households in upper, middle, and lower-income neighbourhoods.

Chapter 3: (Re)framing the food waste narrative: The infrastructure of urban food consumption and food waste in Indonesia

Soma, T. (Forthcoming). (Re)framing the food waste narrative: The infrastructure of urban food consumption and food waste in Indonesia. *Indonesia*

This first empirical chapter is based on an article in the special issue “The Politics and Poetics of Infrastructure” forthcoming in the journal *Indonesia*. The chapter lays the foundation of this dissertation and explains the significance and novelty of the study by challenging the dominant narrative in food waste studies that has largely excluded research on post-consumer urban food waste. In current food waste literature, there is a prevailing narrative that food waste issues in the global South, and countries such as Indonesia, are largely a post-harvest (agricultural) issue. In addition, food waste literature argues that consumer food waste in developing countries is less due to the prevalence of a “buy today eat today” practice. However, the findings in this chapter demonstrate the transformation in food consumption and food wasting practices in Indonesia derive from processes such as market liberalization and the opening of foreign direct investment in Indonesia. The resulting growth of the supermarket revolution, as well as spatial exclusion (through exclusive gated housing) have pitted food provisioning infrastructures such as modern supermarkets against traditional food retailers such as mobile vegetable vendors (*tukang sayur*).

This chapter also explores the role of refrigerators as a food provisioning infrastructure that in some cases can lead to an increased generation of food waste. Utilizing a food waste regime conceptual framework, I argue that these spatial and market transformations are threatening a ‘buy today eat today’ practice and are facilitating the practices of stocking up on food. The study also uncovers diverse food provisioning practices between households of different incomes. In terms of theoretical contributions, this
Chapter four is based on the academic article “Gifting, Ridding and the Everyday Mundane: The Influence of Class and Culture in the Generation of Food Waste in Indonesia” published in the peer-reviewed journal *Local Environment: The International Journal of Justice and Sustainability*. The chapter explores the unequal power dynamics that exist within household units - especially between employers and their domestic helpers who are often expected to absorb or creatively reuse the leftovers of upper class consumption and surplus. I apply a food waste regime framework to demonstrate the burden often put on the low-income communities to absorb the waste of the upper class. I argue that understanding the inter-class dynamics of the household is key to understanding the broader phenomenon of food waste and promoting an approach to food waste prevention that is dignified and socially just. The seminal work by Evans (2014) defines food waste as:

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\text{the passage of ‘food’ into ‘waste’ occurs “as a more or less mundane” consequence of the ways in which practices of everyday and domestic life are currently carried out, and the various factors that shape the prevailing organisation of food consumption (emphasis added) (2014, xv).}
\]

This chapter theoretically contributes, develops and extends Evans' (2014) conceptualization of the definition of food waste by including the perspective of social justice. The chapter also offers theoretical contributions by applying the food waste regime framework to demonstrate the uneven organization of
risk and uncertainties between households of different incomes and classes and especially between employers and domestic helpers. Challenging the Eurocentric notion of what is meant by a “household”, this chapter demonstrates that in the Indonesian context, there are more fluid ways in which respondents define household memberships and kinship. Therefore, there are implications with respect to household structure on food wasting.

Chapter 5: Wasted Infrastructures: Urbanization, Distancing and Food Waste in Indonesia


The fifth chapter, is based on an article “Wasted Infrastructures: Urbanization, Distancing and Food Waste in Indonesia,” *Built Environment*. 43(3): 431-446 published by the journal *Built Environment*. I apply the conceptual framework of “distancing” and identify the role of urbanization in the spatial and mental distancing of both the food supply chain and waste management infrastructure in Indonesia. The conceptual framework of distancing is identified by Princen (2002, 157) as ‘…the separation of primary resource-extraction decisions from final consumption decisions’ is commonly used to analyze the movement of waste and resources and to explain resource overuse. In the case of Indonesia, I argue that distancing has had a direct impact on food waste generation and the lack of sustainable waste management options for food waste by disconnecting people from their source of food production and the impact of their waste. Uncovering the complex infrastructure (or in many cases lack thereof) of waste management in Indonesia illustrates the inequality in the way that different classes access waste infrastructure. As Clapp (2002) argues, ‘consuming’ is a practice in the generation and distribution of waste. This chapter demonstrates that the generation and unequal distribution of food and waste through distancing are reflected in the transformation of food consumption shifting toward more complex long-distance food supply chains and the management of food waste away from the home and into open dumpsites. There is
also a discrepancy in how people of different classes are impacted by food waste and especially by food packaging waste. This chapter argues that food packaging is a tool of distancing and is needed to support a long-distance food supply chain. As Indonesia moves from traditional and biodegradable food packaging, I argue that policy makers should not emphasize the burden of managing food packaging waste on low income communities.

Chapter 6: Space to Waste: The Influence of Income and Retail Choice on Household Food Waste in Indonesia

In the sixth chapter, I analyze the results of 323 household questionnaires conducted in Bogor, Indonesia. This chapter is the first in Indonesia and Southeast Asia to gather significant quantitative data on household food consumption and food wasting practices. This chapter statistically examines whether there is an association between variables such as income, retail type and the amount of household food waste generated in Indonesia. Furthermore, the chapter illustrates the need to connect the community’s knowledge on how to compost with actual composting facilities and support. In this chapter, practice theory (Shove and Pantzar, 2005) is applied in the analysis of the findings. Shove and Pantzar (2005) argue that social practices can be understood based on three main categories: 1) material; 2) meaning; and 3) competence. Using practice theory, I argue that planners should take a closer look at different types of retail format (material), cultural understanding of food and waste (meaning) and capacity to manage food waste (competence) to understand how policies can contribute toward sustainable consumption and production. To conclude, a better understanding of the intersection between material infrastructure and the everyday practice of food waste generation will enable planners and policy makers to develop food provisioning infrastructures that are sustainable and equitable.

1.5 Key Themes

Themes emerged such as a general sense of frustration and lack of control over Indonesia’s inadequate waste infrastructure, especially in relation to the management of food packaging waste and its
role as a barrier to composting. Food insecurity caused by the development of lands that were once used to grow food by low-income households, and a growing dependence on purchasing food are other concerns. While the word “urbanization” (urbanisasi) was mentioned by some key informants such as planners as a cause of land scarcity, it was not mentioned by the household respondents. Land scarcity is also a concern for respondents as it has diminished the ability to grow food and compost. The conceptual framework of distancing (Princen, 2002) emerged from the literature review, the interviews, as well as the participant observation at dumpsites, shops and in neighbourhoods. Moreover, recurring themes found in the study illustrate distinct food consumption practices of households with different incomes as well as the intra-class dynamic between employer and domestic helper as they negotiate the movement of food into waste or vice versa.

Another theme that emerged from the study is the fact that the state does not figure prominently in addressing issues of food insecurity and food waste. “People as food waste infrastructure” is a reference I use in this study and it reflects the problematic practice of placing the burden/onus of food waste and food packaging waste management on the poor and marginalized communities. The approach taken by the municipality and upper-income households might serve as an ameliorative temporary solution to reduce waste or hunger. However, this dissertation will argue that beyond acts of sharing food to reduce hunger or moving surplus food to divert it from the landfill, transformative redistributive justice is necessary. Transformative approaches include land reallocation for food growing as well as investment in opportunities for small and medium sized traditional food retailers and enterprises offering local seasonal foods. Better management of waste infrastructure at the municipal level, and accountability on the part of food producers and retailers are also critical to long-term systemic changes.

Gender is critical in the study of household food provisioning (Bava and Park, 2007; Little, Ilbery and Watts, 2009) and is also an important theme that emerged from this study. In this study, food
provisioning and food waste are predominantly dealt with and managed by women. However, due to the nature of the multi-paper model, of which I contributed four empirical chapters, I was unfortunately unable to comprehensively address the issue of gender in this dissertation. I do acknowledge the importance of gender issues in this particular research, and wrote a book chapter on gender, food waste and informal learning based on findings from this study entitled “The Tale of the Crying Rice: The Role of Unpaid Foodwork and Learning in Food Waste Prevention and Reduction in Indonesian Households” (Soma, 2016) published in Sumner’s (2016) book on *Learning, Food, and Sustainability*. In this book chapter noted above, I outlined the critical role that women play in passing down traditional and intergenerational knowledge around food literacy to their children and in instilling moral values to respect food and reduce waste. This knowledge is transferred through folktale storytelling, spiritual teachings, as well as gender-based food work such as cooking, and is transferred intergenerationally and continuously by women (Soma, 2016). In the book chapter, I also critically challenged the devaluation of “unpaid foodwork” and agreed with Blackburn (1999) that it is problematic to apply market concepts such as “paid” and “unpaid” to describe non-market work performed by women. For example, by framing domestic food work simply as “unpaid work”, there is a lack of consideration of other important social reproductive, spiritual, as well as cultural contributions (Soma, 2016). The context in which these unpaid practices occur (for example when Ayu teaches her daughters how to cook) are beyond the framework of market-based labour. The framing of domestic food-related work as “unpaid foodwork” (note that I am not considering the labour of domestic workers) is problematic as it devalues food-related work that is not tied to market-based monetary compensation. By acknowledging the valuable work that women do to advance food literacy and environmentally sustainable practices to prevent and reduce food waste, the book chapter advances the important contribution and valorization of women’s household food provisioning work in Indonesia.
Chapter 2:  
Methodology  

2.0 Situating Myself

In the process of situating myself as a food system and urban planning scholar, I reflect on my childhood in Indonesia. Growing up in the City of Bogor, in the island of West Java, Indonesia (I was born in the City of Bandung), the act of wasting food was often connected to the story of the “crying rice.” The admonition is as follows: “Tami, makan setiap butir nasinya, kalau tidak dimakan, nasinya nangis” the translation of which is “Tami (my nickname), eat every single grain of rice, if you don’t eat it the rice will cry”. This admonition usually came from my mother who learned the story from her late bibi. “Bibi” is a name referring to “aunt” or “domestic helper.” Growing up, my mother and father both worked full-time in public service: my mother as a doctor and professor and my father as a waste management planner and engineer. Therefore, I had my own caregiver, the bibi who cared for my sister and I for over a decade. She also used the same admonishment. Considering the strong influence of rice culture in the island of Java, not surprisingly, this admonition has become instinctually ingrained in my repertoire without ever questioning the actual story/legend behind the concept of the crying rice. Interestingly, prior to returning to Indonesia to conduct fieldwork, I did not consciously connect the rice story with my research on food waste.

It was not until I returned to Indonesia for fieldwork that the admonition that I heard when I was a child resurfaced. The story returned to me when encountering and observing parents feeding their children and warning them not to waste food by telling them “the rice will cry.” However, it was not until I met Atheera (an upper income retired respondent) and had the opportunity to meet her elderly domestic helper Cici (pseudonym) that I was informed of the actual story behind the common tradition “nasi menangis.” I was told that there is an old tale of a farmer harvesting rice from the paddy. Having completed the work,
she heard a sobbing sound coming from her field. She looked around and around for the source of the sound, only to eventually find that the source of the sound was a handful of unharvested rice plants that were left behind during the harvest. The rice “crying” represents the emotional relationship to food and the pain caused by the wastage of labour, land and resources from the wasted rice (Soma, 2016).

It was the realization of my culture’s connection to the land, and most importantly to rice, that allowed me to better understand my interest in conducting this research. As I was immersed in the Sundanese (an ethnic tribe that I belong to) culture and traditions, I was sensitive to the changes in consumption patterns, and attitudes, as well as the disconnection from rice and land caused by rapid urbanization in Bogor. As a researcher born and raised in Indonesia, I was brought up with an emotional relationship to food and a deep connection to rice. After all, there are dances and celebrations to commemorate various acts of harvesting rice. For example, tari panen (harvest dance) is a dance celebrating the harvest and mimics the movements of farmers as they reap and sow. Birthdays are celebrated with the Sundanese tradition of cooking bubur merah dan bubur putih (red and white rice porridge, one side sweetened with brown palm sugar to make it look red, and the other side cooked in simple coconut milk). Syukuran, a celebration to give thanks for diverse events such as child birth, graduation, and in my case, my return home, usually feature a dish of nasi kuning, a large volcano shaped rice made yellow with turmeric and adorned with meat, eggs, tofu and other assorted vegetables.
2.1 Insider-Outsider

Taking into account my cultural background and my relationship with the community is critical in the process of situating myself as a researcher. However, I also acknowledge the fact that I have been trained in Western academic institutions since I started my undergraduate degree in Canada in 2002. While my grandfather had a small farm, I resided mostly in urban areas growing up. With the exception of picking fruits from the fruit trees around my yard or watching chickens roam in the neighbourhood, I generally did not participate in farming or agricultural endeavors (my parents did own a dairy cow supplying us with fresh milk for several years). My parents were also highly educated even though they came from humble means as both obtained doctoral degrees in Indonesia. I lived in Indonesia in a comfortable middle-class household. This detail in terms of power relationships is important as I worked with low-income respondents in my study. In Indonesia, trust is built through long-term relationships and in my case, my membership in the community (despite being away for so long) and my parents embeddedness in the community allowed me to gain the trust of my respondents very quickly.¹

The literature in the field of qualitative studies is replete with discussions regarding the benefits and/or challenges that occur when the researcher is an insider, outsider, or both. As Dwyer and Buckle (2009, 55) argue, “the personhood of the researcher, including her or his membership status in relation to those participating in the research, is an essential and ever-present aspect of the investigation.” Kanuha (2000) identifies insider research as a study in which the researcher conducting the study is also a member of the population (community) that she or he is studying. In my case, I hold a dual status as an insider-outsider in the community that I was researching. Note that the hyphen between the “insider” and “outsider” is crucial as I occupy what Dwyer and Buckle (2009) define as “the space between.” There are

¹ Note, I did not interview the caregiver/domestic helper who cared for my children while in Indonesia.
many benefits of being an insider, most importantly, the awareness of the nuances of language and culture, the ability to honour cultural norms and values as well as the ability for deeper involvement (Yakushko et al, 2011; Merriam et al., 2011). On the other hand, there are also benefits to being an outsider as questions about objectivity and reflexivity, as well as concerns that the researchers may “know too much” or “is too close to the project” have been raised at insider research (Kanuha, 2000, 444). The importance of understanding the researcher’s positionality (gender, ethnicity, class etc) is acknowledged in postmodern discourse and the context arose due to issues around power and identities in the framing/analysis of phenomenon in the field of qualitative research (Angrosino, 2005). In the field of planning, the context and the positionality of the researcher become even more important as questions are posed about “what needs to be done?” and interventions are often recommended.

In conducting research on household food waste in Indonesia, issues around morality, spirituality, and gender roles in the household emerged prominently. Understanding the context as well as how faith-based and cultural reasoning factor in matters of food provisioning is critical. In this role, my insider membership within the community was helpful, as orientalism, the prism in which Said (1978) argues often results in a patronization, discrimination and/or fetishization of Eastern and more specifically, Arab and Muslim practices, may lead to interventions and narratives that perpetuate the framing of certain beliefs/perspectives as inferior to Western thought. As an insider familiar with the cultural and spiritual discourse in Indonesia around women’s roles and responsibility, I can understand the immense value and personal investment that many of the women respondents - especially those working at home - put on childcare, home management, and most pertinent to this study, food provisioning.

On the other hand, as an “outsider”, I also saw the need for a more egalitarian approach to domestic work. As a working mother in Canada currently without the necessary income to pay for daycare fees or a caregiver, and with a spouse who has had to intermittently sacrifice his career to take time off to raise
our children so I can pursue my own career, I can’t help but recognize that female domestic helpers are the foundation for upper and middle-class working women’s mobility in Indonesia. As an outsider, I felt a sense of envy as I lacked that support, but at the same time I also felt unease as I saw the middle and upper-income women free to pursue their professional career, able to work long hours and travel, while having the ability to ensure that their families are nourished with healthy, home cooked fresh foods, as they had support from domestic helpers who constantly live in food insecurity and poverty like Hesti.

As an outsider, having been away for over a decade, many in the community -including my respondents- would often ask in a teasing manner, “tiasa nyarios Sunda neng?” which in Sundanese language means “can you speak Sundanese miss?” I usually respond “tiasa, saeutik” (I can a little) while smiling sheepishly. While all Indonesians must learn to speak the official language Bahasa Indonesia, the ability to speak Sundanese meant that I belong in Bogor. There were also a few times when I forgot some Indonesian words or was not familiar with new slang and people would giggle. However, as an outsider, my relationship with the low-income respondents afforded me an opportunity to forge a different type of relationship that would not be possible had I maintained my insider middle-class status. For example, in the beginning, many of the low-income respondents were embarrassed to invite me to their house as they would say “malu ah neng, rumah bibi kan kecil” (I’m embarrassed miss, bibi’s house is small) or “masa neng mau masuk ke kampung” (are you sure you want to go to the village miss?). These comments are made because the respondents are aware of my middle-class status and the fact that employers and upper income members in Indonesia do not necessarily visit the homes of their domestic helpers or enter kampung. However, after the initial concerns were addressed, respondents were happy that I would listen to their concerns and issues. In fact, my visit was embraced by the village’s female leader as I was seen as someone who could understand and listen to the voices and concerns that are often ignored.
Sitting on the floor alongside the domestic helpers or eating on the floor with them is usually seen as a non-conventional practice in Indonesian middle-class culture but is alien to Islamic traditions which recorded that the Prophet Muhammad (peace be upon him) would eat with the poorest members of society and shunned notions of superiority based on class, gender, race, or occupation.Enabled by my outsider status, it is these types of “small” gestures of positionality, such as sitting on the floor to eat together and talk, visiting their homes and families, and sharing personal stories, that allowed my low-income respondents to feel at ease in confiding their narratives and participating in the study. It is common for the helper to sit on the floor or in the corner of the kitchen while the employer sits on a chair. This is a symbol of positionality (one above and one below). Due to my outsider status, I resisted acts such as this in my own home and disrupted the expected Indonesian middle-class positionality by eating together on the floor with my children’s caregiver or joining her in the kitchen. If she did not feel comfortable joining me at the dining table, as an insider, I recognized that I was the one with the power to choose and sit with her on the floor.

Another issue which reflected in my insider-outsider perspective is the gifting of food. As I will explain further in Chapter 4, the sharing and gifting of food is embedded in Indonesian culture. The ease at which neighbours and families would share their foods with one another is enviable from a Canadian perspective where concerns over food safety, anxiety, taste, legality, and preference often prevent one from sharing food with ones’ neighbours (for an example of this issue in the U.K see Evans, 2015). Not only is there normalcy in sharing home cooked meals with one another, this is also a way for Indonesians to share wealth, build communities, and build relationships. On the other hand, there are also ways in which the gifting of food symbolizes unequal power relationships in a way that was difficult for me to accept as an insider-outsider. For example, I noticed that in gifting food, the employer would often give the “worst cut” of meat to the helper (chicken feet, chicken butt) while keeping the meatier and more
expensive portions such as the breast and drumstick for themselves and their families. The employer’s family would eat first and the helpers would eat after from whatever portion that was not consumed. This is also deeply problematic as noticeably, the portion of food given to the helper is generally smaller. These practices symbolize a relationship that I understood and was familiar with as an insider, but felt very uncomfortable in observing as an outsider. Thus, it is critical to consider my recommendations for planning interventions in light of my occupying the space in between an insider and an outsider.

2.2 Qualitative Methods:

The following two sections will address the methodology used in this study. The study employs a mixed methods approach. The qualitative component of the study involved collecting data from households during a field research period between May 2014 to August 2014 and July 2015 to October 2015 in Bogor, Indonesia. The study was approved by the Research Ethics Board at the University of Toronto. Participants came from low (n=7), middle (n=7), and high-income (n=7) urban households for a total of 21 households. In the qualitative component of the study, in one of the high-income and one of the middle-income households, I only interviewed the domestic helpers as the homeowners were busy and the domestic helpers in that household had the primary responsibility for food provisioning. In all other cases where domestic helpers were present in the household, I interviewed both the homeowner and the domestic helper if they were each responsible for different aspects of food provisioning, preparation and disposal. In the study with 21 households, only one male claimed responsibility for food provisioning (shopping and cooking). The households were recruited through snowball sampling and lived in various neighbourhoods around the city of Bogor with the exception of two households located in an elite residential housing site at the periphery of the city centre but still within the Greater Bogor area (Kabupaten Bogor). I had to recruit from the outskirts of the city as I was not able to identify enough upper-income households. The households were categorized based on income-level (based on income
ranges that respondents selected). Obtaining numbers on the actual household income was difficult due to common circumstances such as irregular income (in the case of low-income households) as well as the cultural taboo of stating one’s income. Respondents were asked to choose from a range of income estimates and based on their selection, categorized into low, middle and high income. Efforts were made to ensure that the household composition, culture, religious beliefs, workplace and shopping locations varied amongst the households selected.

The research included repeat in-depth semi-structured interviews (Mason, 2002), “going along” (Kusenbach, 2003) with the respondents on food shopping trips, accompanying them during meal preparation, observing the management of food waste, checking the fridge and cupboards (Pink, 2004) in most of the houses, participant observation in the household as well as around the neighbourhood where possible. The in-depth interviews allowed for a better understanding of household attitudes to food and waste and gathered information on food preferences and challenges with respect to food waste generation. Participant observation and going along on shopping trips to supermarkets, wetmarkets, and mobile vegetable vendors provided information on how respondents decide what and how much to buy as well as family dynamics and patterns of interactions (or the lack thereof) with food providers/vendors. I conducted one “going along” session with each of the households. Multiple in-depth semi-structured interviews consisting of at least two or three interviews per household, each varying in length from 45 to 60 minutes were conducted (participant observation of the house is not included in the 45 to 60 minutes interview and averages one or two hours either before or after the interview). Because most of the households were located in the same neighbourhood area, participant observation also included observations around the neighbourhood beyond the house visits.

The respondents were asked questions regarding the transformation of food retail in Indonesia during their lifetimes and their food retail preferences. Questions were also directed at the causal factors
in relation to the respondents’ household food waste (if applicable). During periods of observation, I observed respondents’ interactions with vendors and compared these interactions based on the different retail formats. In the interviews, respondents were also asked to recount their practices of food waste management (for example, whether they fed food waste to animals, compost, mixed food waste with non-organics, shared leftovers) and the reasoning behind their choices. Respondents were also asked about their ability to compost, the availability of composting space, and barriers to more sustainable food waste management if applicable.

Two to three visits were held with the households to provide an opportunity to observe shopping, cooking, eating and food waste management practices, as well as to cover roughly 76 interview questions (depending on applicability). There were several broad themes addressed in the interviews relating to food provisioning and food waste management. The first part of the interview (questions 1-25) covered basic information on demographics, food shopping (such as frequency, types of retail frequented, methods of going to the shop). Questions 26-37 covered cooking. Questions 38-57 addresses food consumption patterns such as food choices/ preferences of eating in or out, changes and transformations in food consumption. as well as employment (time scarcity, commute time), cultural values and attitudes regarding waste. For example, respondents were asked questions about the built environment and the respondents’ memories of the changes in retail and waste infrastructure, as well as any changes in their shopping, eating and cooking patterns within the span of 10 years in Bogor. Questions 58-76 focused on food waste management, prevention, and waste collection.

Interviews were conducted in Bahasa Indonesia (Indonesian language), audio recorded and then transcribed. Coding was done in the original language of either Bahasa Indonesia, or in the case of several respondents who spoke English and wanted the opportunity to practice, in mixed English and Indonesian.
The author went over the materials by hand, highlighting patterns in each interview, highlighting recurring key words, expressions and categorizing them into broader themes (Basit, 2003).

The low-income households were selected through referrals from domestic helpers in the neighbourhood. I also directly recruited a domestic helper who worked in the neighbourhood during morning walks who then referred me to her neighbours. It is common for the domestic helpers to gather in the morning and sweep the street or congregate for groceries in front of the mobile vegetable vendor (tukang sayur). The village where all of the low-income respondents in my study resided is located adjacent to a middle and upper-income neighbourhood.

For the middle and upper-income households, I was faced with tall gates and bolted fences. As upper and middle-income Indonesians are wary of frequent attempts of fraud and robbery, it was impossible for me to recruit upper and middle-income homeowners without first being introduced by family members and friends. Referrals were obtained through my Indonesian relatives and acquaintances as this facilitated the process of trust building and gave me access to their homes and kitchens. The study occurred partly within the Eid celebration. This information is important because it is common to gift food and feast with families during this month. However, the study also included non-Muslim families who did not celebrate Eid. While Eid celebration did fall during both research time frames, it is important to note that Eid is only celebrated for a few days (on average three days) and the length of this study (two periods of approximately four months of research) included ordinary months pre-and post-Eid. Expanding the fieldwork beyond Eid ensures that the findings are relevant to other times of the year. To maintain anonymity, all names are pseudonyms (see Figure 2). The ways in which the narratives of the respondents are discussed echo the method applied by Gregson, Metcalfe and Crewe’s (2007) ethnographic study on household waste disposal and processes of ridding. In Gregson, Metcalfe and Crewe’s (2007) study, a

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2 Eid-ul-Fitr and Eid-ul-Adha are two holy days for Muslims. Eid-ul-Fitr is preceded by the month of Ramadan where Muslims who are able abstain from water or food for 30 days between dawn and sunset.
background narrative of the respondents is outlined to set the context and familiarize the readers with the interviewees that are quoted.

In addition to the 21 households, 12 key informant interviews were conducted with stakeholders to gain expert opinion from those managing the collection of waste and waste policy as well as those actors working in the food sector. The interviews were conducted with the directors of a large hypermarket (n=2), a manager of a mid-sized supermarket (n=1), mobile vegetable vendors (tukang sayur) (n=3), four local government representatives from the administrative village (kelurahan) (n=1), the waste department (n=1), and planning department (n=2)- a neighborhood leader (Rukun Tetangga) (n=1) and an informal waste collector in the neighborhood (n=1). One informal waste collector was selected because he worked in the neighbourhood where the majority of the respondents resided. He has worked in the community for decades and provides waste collection services to the upper, middle and lower-income households in the neighbourhood. I was able to interview him twice to gain a better understanding of how the waste collection system works, and the barriers to more sustainable food waste management.

As I was seeking lead experts whose roles impacted food provisioning practices and food waste management (directly or indirectly), I interviewed the senior staff of waste and planning departments (housing planning and regional development). The interviewees representing the government (the planners, waste manager, leader of the administrative village) were selected after a lengthy process whereby I submitted a formal letter to the Directorate of National Unity and Politics (KESBANGPOL Direktorat Kesatuan Bangsa dan Politik) expressing my interest in conducting several key informant interviews and submitting a letter signed by my field supervisor (from the Bogor Agriculture Institute). I was also required to obtain a letter of permission from the Ministry of Research and Technology showing my approval to conduct a study in Indonesia (I am a Canadian Citizen and therefore treated as a foreigner). After submitting my papers, a representative of the government provided me with the necessary papers to
be used for officially requesting an interview with the appropriate government representatives. Securing interviews with government representatives was quite challenging with multiple steps to gain approval and multiple last-minute cancellations. While it would be ideal to interview multiple waste representatives, waste collectors, and retailers, the key informant interviews served as a supplement to the most critical part of the study which is the household qualitative study.

While the qualitative study with the households is focused on understanding household food consumption, dynamic and practices, the key informant interviews helped understand the broader context where these food practices are embedded. Findings from the key informant interviews also explained the policies that shape Bogor’s urban development, retail and waste infrastructure. Figure 2 provides an overview of the household respondents interviewed in the study.

**Figure 2: Household Interviewees’ Profiles**

<table>
<thead>
<tr>
<th>Informant</th>
<th>Income category</th>
<th>Age</th>
<th>Occupation</th>
<th>Household Size</th>
<th>Family Members</th>
<th>Domestic Helpers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puspa</td>
<td>High</td>
<td>52</td>
<td>Philanthropist, homemaker</td>
<td>5</td>
<td>Couple with 3 young adult kids</td>
<td>2 live-out</td>
</tr>
<tr>
<td>Yulia</td>
<td>High</td>
<td>59</td>
<td>Business woman for a foreign company</td>
<td>4</td>
<td>Couple with one teenager</td>
<td>1 live-in and 1 chauffeur</td>
</tr>
<tr>
<td>Saskia</td>
<td>High</td>
<td>40</td>
<td>Teacher</td>
<td>5</td>
<td>Couple with two kids</td>
<td>1 live-in</td>
</tr>
<tr>
<td>Indah</td>
<td>High</td>
<td>72</td>
<td>Housewife</td>
<td>7</td>
<td>Couple with an adult son, spouse, 2 grandchildren who eat in the house everyday</td>
<td>1 live-in</td>
</tr>
<tr>
<td>Adheera</td>
<td>High</td>
<td>70</td>
<td>Retired Professor</td>
<td>8+</td>
<td>Grandmother, son and daughter in law, two grand children</td>
<td>1 live-in, 1 live-out, chauffeur (at the time of interview, 5 construction workers)</td>
</tr>
<tr>
<td>Suci</td>
<td>High</td>
<td>37</td>
<td>Teacher</td>
<td>6</td>
<td>Couple with one kid</td>
<td>2 live-in and her son</td>
</tr>
<tr>
<td>Helen</td>
<td>High</td>
<td>42</td>
<td>Businesswoman</td>
<td>5</td>
<td>Couple with two kids</td>
<td>1 live-in</td>
</tr>
<tr>
<td>Yuda (domestic helper Nani interviewed)</td>
<td>Middle</td>
<td>53</td>
<td>Manager</td>
<td>4/6+</td>
<td>Couple with three adult kids. One mother-in-law who lives in the house every other week/month</td>
<td>3 live-out</td>
</tr>
<tr>
<td>Ira</td>
<td>Middle</td>
<td>36</td>
<td>Housewife and private tutor</td>
<td>3</td>
<td>A couple with one kid</td>
<td>None</td>
</tr>
<tr>
<td>Icha</td>
<td>Middle</td>
<td>30</td>
<td>Lecturer</td>
<td>4</td>
<td>Couple with one kid</td>
<td>1 live-in</td>
</tr>
<tr>
<td>Sarah</td>
<td>Middle</td>
<td>54</td>
<td>Businesswoman</td>
<td>4/6</td>
<td>Couple with 3 kids</td>
<td>1 live-in</td>
</tr>
<tr>
<td>Santi</td>
<td>Middle</td>
<td>40</td>
<td>Home business</td>
<td>2</td>
<td>Father and daughter</td>
<td>1 live-out</td>
</tr>
<tr>
<td>Joko</td>
<td>Middle</td>
<td>61</td>
<td>Retired Businessman Entrepreneur</td>
<td>3/4</td>
<td>Couple with three adult kids</td>
<td>None</td>
</tr>
<tr>
<td>Sinta (domestic helper Atun interviewed)</td>
<td>Middle</td>
<td>58</td>
<td>Professor</td>
<td>8/9</td>
<td>Couple with daughter, son-in-law, 2 grand children, grandmother.</td>
<td>1 live-in and 1 live-out</td>
</tr>
</tbody>
</table>

30
Tuti  Low  36  Multiple part-time jobs,  5  Couple with three kids  None
Rita  Low  40  Domestic Helper  4  Couple with two children  None
Hesti  Low  41  Domestic Helper and other jobs  9  Couple with 5 children, a daughter in law, grand daughter  None
Ayu  Low  61  Domestic Helper  3/5  Couple with one adult child, a daughter in law, granddaughter that comes to stay over frequently  None
Diah  Low  34  Laundry washer  4  Couple with one child and a mother in law  None
Nurul  Low  34  Housewife  5  Couple with three children  None
Wulan  Low  35  Housewife and neighbourhood representative  4  Couple with two children  None

Source empirical data gathered by the authors.
*Names are pseudonyms

2.3 Quantitative Methods:

From July 2015 to October 2015 a face-to-face household survey was administered in the central Bogor area of “Kelurahan Tegallega” (Tegallega ward) by the researcher with the assistance of four research assistants. The research assistants were hired based on recommendations from my field doctoral supervisor and a Professor with the Faculty of Human Ecology and Nutrition at the Bogor Agriculture Institute. The research assistants who assisted me in the survey were all upper-year undergraduate students with experience in conducting household surveys (in the field of nutrition) and knowledge of statistics. I interviewed a total of eight recommended students and hired four. I conducted three training sessions including providing an overview of the research, refresher training on administering household questionnaires, and providing the opportunity for the RA’s to test the survey and share feedback prior to commencing the study. I audited their work by joining them as we administered the questionnaires together. Every week, the RAs would meet to share feedback, concerns (if any), and to submit the completed surveys. As for the data entry, I would randomly check the questionnaires and compare it with the inputted data in excel. The survey was piloted in six households prior to being administered. Changes were made to clarify the questions as the survey was originally developed in English and needed to be translated.
A total of 323 households, consisting of upper (n=62), middle (n=107) and lower (n=154) income households participated in the study. Out of the 403 households that were approached, 80 households declined the survey. This represented a survey response rate of 80.1%. The household surveys were conducted in Bahasa Indonesia (Indonesia’s official language) and administered in person with the participants answering the questions and the researchers filling in the survey. In one instance a homeowner requested that the survey be left behind and then picked up. However, the rest of the surveys were conducted in person by the researcher. Each interview lasted approximately 15 to 20 minutes.

The households in this study were selected by stratified and systematic random sampling (De Vaus, 2013). The first step in the sampling process consisted of simple random sampling. First, using simple random sampling, I selected three Rukun Warga (RW) out of a total nine RW. An RW (Rukun Warga) is the fifth level of administration under “Kelurahan” (the ward level). The second step involved the selection of three Rukun Tetangga (RT) (Neighbourhood districts) within each RW. A Rukun Tetangga (RT) is the sixth level of administration below RW. The RT were selected from within the three RW’s through a stratified sampling based on income to ensure that the nine RTs will include a combination of upper, middle and lower income households. Therefore, a total of nine RTs from three RWs were selected. The process of conducting the survey and selecting the households occurred through systematic sampling (De Vaus, 2013), which includes knocking on the door of every third house in the neighbourhood between 8:00 a.m. to 6:00 p.m. To ensure that the survey also included households with weekday schedules who work during weekdays between 8:00 a.m. to 6:00 p.m., surveys were also administered on weekends (Saturdays and Sundays). If the selected household did not accept the questionnaire and refused to be interviewed, the adjacent house was then approached (this does not include unoccupied households). While non-response bias could potentially lead to a lack of diverse responses amongst respondents, it is also largely a problem for studies with a low-response rate such as mail-in surveys. In this study, we had
a high response rate of 80.1%. Once the household accepted, the pattern resumed by selecting every third house. The households were provided with a sheet containing information on the research, the questionnaire, as well as our contact information. They were also provided with a small tote bag and a bag of instant coffee as a thank you for participating. Making personal contact with the participants rather than just leaving the survey at the door allowed for a better participation rate. For each household that agreed to our request, the individuals who are primarily responsible for food provisioning and preparation (which may be the domestic helpers) were interviewed. In the study, the sample comprised of 323 households of which 93.8% of the respondents were female (see Table 1). In Indonesia, similar to many other countries, including the United States, the person primarily responsible for food provisioning and preparation are usually females and domestic provisioning is a gendered practice (Castellano, 2015).

2.4 Survey Administration

The survey consisted of 33 questions which included a combination of multiple choice questions, yes and no questions, and likert scale questions (see Appendix D for more detail on the household survey). The survey asked questions about frequency of shopping, where respondents shop, menu planning, shopping practices, demographic characteristics of the household, food waste management, cultural values around food wasting, knowledge of composting, access to composting space, how much food is wasted (based on food categories) and more. For example, respondents were asked to identify whether they planned their menus in advance and what they did with leftover/surplus food. In addition, the survey also asked likert scale questions (1= strongly agree; 2= agree; 3=disagree; 4= strongly disagree) on attitudes toward food waste.

There are some limitations in this study as it was not possible to conduct a food waste audit of the 323 households and there is limited data available at the municipal level. Therefore, to gain an estimate of the amount of household food waste generated, a waste index was developed based on respondent’s
estimate of the amount of food they wasted. The waste index provides an estimate of the amount of food wasted by category. For the waste index, respondents were asked to rate the amount of food wasted in one week based on six food categories: 1) Fruits, 2) Vegetables, 3) Baked goods: Bread and Cookies, 4) Rice, 5) Protein/ Meat, and 6) Beverage: Milk and Juice. The highest total points possible for the index is 36 points should a respondent select 6 points for each food category (6 points= significant amount of waste, 1= no waste, 0= did not consume food/ not applicable). There may be limitations with self-reported waste estimates. The most important concern is that people may underestimate their waste. For example, in the case of reporting of pro-environmental behaviour, Porter, Leeming and Dwyer found that “the recycling interventions tended to be stronger where researchers measured self-reported recycling rather than the actual volume of recycled material” (1995, 368). However, Kormos and Gifford (2014) found a strong association between self-reported and objective pro-environmental behaviour. Kormos and Gifford (2014) argue that self-reporting is a convenient and cost-effective indicator of behaviour with high levels of validity (in some cases). Due to budgetary and time restrictions, the household survey in Indonesia employed self-reporting of food waste amounts. The empirical findings from the qualitative study are useful to triangulate findings from the quantitative study. The quantitative study is set in Bogor and may offer transferable interventions and findings to other areas in the Global South.
Chapter 3
(Re)framing the food waste narrative: The infrastructure of urban food consumption and food waste in Indonesia

3.0 Introduction:

The current industrial food system is rife with paradox. The Food and Agriculture Organization (FAO) along with the British Institute of Mechanical Engineers (IMG) reported that anywhere between 30% to 50% of the food produced for global human consumption is wasted annually (Gustavsson, Cederberg, Sonesson, Otterdijk & Meybeck 2011; IMG, 2013). The staggering amount of food that is wasted globally is particularly problematic when considering that the industrial agricultural system is highly dependent on fossil fuels (Roberts, 2008), is responsible for 70% of global freshwater withdrawals (Döll 2009) and has been identified as one of the largest contributors to anthropogenic greenhouse gas emissions (Vermeulen, Campbell & Ingram, 2012).

It is argued that reducing food waste is “a strategy for closing the food gap between food available today and food needed in 2050 to adequately feed the planet’s projected 9.3 billion people” (Lipinski et al, 2011, 2). This phenomenon of “scarcity amidst plenty” (Araghi, 2000) is evidenced by the fact that an estimated one billion people are malnourished (Naylor, 2011) even though there is enough food to feed approximately ten billion people (Holt-Giménez, Shattuck, Altieri, Herren, and Gliessman, 2012). However, the dominant food waste narrative - which states that food waste is a problem of the global North while food loss is a problem of the global South – is overly simplistic and fails to account for factors such as the globalization of food production, market liberalization, urbanization, growth of modern food infrastructure and class/income inequality.

Research on food waste in the global South has largely ignored consumer food waste (with the exception of Oelofse & Nahman 2013; Peckan et al., 2005; Stefan et al., 2013; Porpino, Parente and
Wansink, 2015) and is primarily focused on “food loss” at the agricultural stage (Schneider, 2013). Because food waste is a multi-scalar problem and the trade of food products is connected globally, the Food Waste Regime [“FWR”] framework will be applied in this chapter to demonstrate that food waste solutions that are limited to innovation in a few sites or countries will likely exacerbate existing inequalities (Gille, 2013, 27). Such focus on mechanical interventions at the farm stage means that the rapid development in urban areas, paving over of farmlands, and the rate of consumption in Indonesia escape criticism and can continue unabated.

Using Indonesia as a case study, this chapter seeks to reframe the food waste narrative in the global South to reflect a more accurate and nuanced reality of food waste. To accomplish this, it is imperative to examine the transformation in food provisioning infrastructures and how this change impacts food consumption practices. This chapter also illuminates the need to understand the social element of food waste, and particularly, the role of relationships in the creation of household food waste in Indonesia. By exploring the nexus between food provisioning, consumption and waste, this chapter hopes to answer the following research questions. First, how has the increase in “modern” food provisioning infrastructure transformed food consumption, food provisioning and food wasting patterns in urban Indonesia? Second, who gets to define what is food and what is waste? To answer the research questions, I conducted a qualitative study employing ethnographic tools such as multiple repeat in-depth interviews participant observation, going along on shopping trips (Kusenbach, 2003) with 21 household respondents of varying incomes, and 12 in-depth interviews with key stakeholders across the food system in Indonesia. Gille’s food waste regime conceptual framework (2013), an analytical framework that views both food and waste as a result of social relations is applied in this study.
3.1 The Need to (Re)frame the Food Waste Narrative

Research on urban consumer food waste in the global South comes at a critical moment as 66% of the world’s population is projected to be urban by 2050 with the most rapid urban growth projected to occur in Asia and Africa (United Nations, 2014). According to UN-HABITAT data, cities in the Asia Pacific are home to approximately half of the global urban population (UN-HABITAT, 2010). It has also been estimated that the number of middle-class consumers will increase to approximately 5 billion by 2030 with the majority of growth occurring in the global South and a majority of the middle-class growth occurring in Asia (Kharas, 2010). This income trend will mean that the consumption patterns of a significant number of people in the global South will change. Middle-class groups “learn and perform ‘modernist’ consumption” (Cloke, 2013, 632) reflecting similar food consumption patterns found in developed countries. Increasingly, the consumption of the affluent populations in developing countries will converge with consumption patterns of those in developed countries, meaning that there will be an increase in demand for dairy, meat, and processed food (Godfray et al., 2010). In Indonesia, the middle-class population grew from 1.6 million in 2004, 50 million in 2009 and is estimated at 150 million in 2014 (Rangkuti and Wright, 2013). With the growing middle-class consumption in Indonesia, and the extreme disparity in income, the associated problems of food insecurity will occur alongside the problem of food waste.

Despite rapid urbanization, the growth of middle-class consumers and changing infrastructure in the global South, the phenomenon of food being wasted has been identified primarily as “food loss”, where it occurs at the harvest stage due to financial limitations, lack of mechanization, poor infrastructure, lack of appropriate handling skills, lack of packaging, and lack of storage facilities (Gustavsson et al., 2011; IMG, 2013). For example, findings from an aggregated data of South and Southeast Asia found that the total food loss at the agricultural stage per capita is between 120-170kg/year while consumer food waste
(post-harvest food waste) is only 6-11kg/year (Gustavsson et al., 2011). Conversely, food waste in developed countries is mostly attributed to consumer behaviour, namely, the “careless attitudes of consumers towards food” or the “throwaway mindset” (see Evans, 2011 for a critique) and a lack of coordination between various actors in the supply chain (Gustavsson et al, 2011; IMG 2013). Insufficient purchase planning, and confusing best-before date labeling are other factors identified in medium/high-income countries (Gustavsson et al, 2011; IMG 2013; Stuart, 2009). The term food loss is defined as wasted food occurring at production, post-harvest and processing stages in the food supply chain (Parfitt, Barthel and Macnaughton, 2010). Meanwhile, the term food waste refers to the food losses that occur at the end of the food chain (retail and consumer) and is related to “wasteful behaviour” on the part of consumers and retailers (Parfitt et al., 2010). Thus far, studies have not adequately distinguished between urban and rural food waste, mostly lumping countries of the global South into categories such as “South and Southeast Asia” (see for example Gustavsson et al 2011). These neat binaries on the causes of food waste are not applicable in the case of Southeast Asia, where industrialized megacities such as Bangkok, Manila and Jakarta are located in countries with a significant agrarian sector (Teng & Trethewie 2012).

The issue of consumer food waste in urban areas of the global South and Indonesia in particular, has also largely been ignored even though a study by Parfitt et al (2010) demonstrated that urbanization and diversification of diet are strongly correlated to an increase in food waste at the later stage of the supply chain. To feed the growing urban population, the food supply chain has been extended from short distance local food supply chains, to global food supply chains. These changes require various infrastructural developments to facilitate food distribution (such as roads, storage, cooling, market logistics) and impact the generation of food waste (Parfitt et al. 2010).

In a review of food waste literature, Parfitt et al. (2010) noted that they were unable to find published studies related to post-consumer food waste in the developing world, attributing this to a
tendency to “buy today, eat today”, which results in less food waste (2010, 3072). However, with the growth of supermarkets, urbanization and the growth in labour force participation for women (Utomo, 2012), this chapter demonstrates that a “buy today, eat today” food culture is changing (especially in the upper class and middle-income population) due to the transformation of modern infrastructures of food provisioning as well as modern food storage infrastructures, such as refrigeration (Greenwood, Seshadri and Yorukoglu, 2005). The rise of retail modernization (Neilson & Pritchard, 2007) entails new ways of building cities and preferential land use policies that favour large infrastructures, such as hypermarkets. Understanding processes of food procurement also entails addressing and analyzing issues of class and spatial access. For example, in Indonesia, the development of large hypermarkets and growing urbanization are changing the landscape of food provisioning which makes access to traditional food infrastructures such as wet markets (discussed in Chapter 6) and mobile vendors, increasingly difficult, while bulk shopping for food at supermarkets is becoming the norm. These spatial transformations demonstrate the link between urban planning and food consumption practices.

3.2 Food Waste Regime Framework

The food waste regime framework [FWR] argues that waste constitutes a social relationship and should therefore be studied as “something that is produced materially and conceptually via social relations” (Gille, 2013, 29). In essence, the power dynamics and class relationships that exist as part of the social fabric in Indonesia provide a window into how food waste is produced and who is most affected. FWR framework also allows for a cross-temporal analysis based on a comparison of the patterns of food waste generation during different economic regimes. Such comparison is relevant in the context of Indonesia considering the shift in economic regimes from a largely closed economic system to an open market that encourages foreign direct investments. According to Gille, “economic risks are a key aspect of the production of waste” which is premised on an uneven playing field (2013, 32). An example of
economic risk provided by Gille (2013) is the uneven playing field experienced by Ethiopian farmers vis-à-vis large U.S. agribusiness. Based on the Thurow and Kilman (2009) study, an immense amount of food in Ethiopia is wasted because food aid coming from the U.S. (consisting of U.S. grown produce) makes the local food produced by Ethiopian farmers unprofitable. The U.S. regime of surplus necessitated the movement of surplus wheat under the guise of “food aid” (Oxfam, 2005). The U.S. had the power to deal with the “risk” of producing more food, as they were able to shift this “risk” by selling it or dumping it in countries of the global South such as Ethiopia. On the other hand, the Ethiopian farmers were unable to compete with cheap/free food aid and this resulted in food being wasted (Thurow & Kilman, 2009 in Gille, 2013). In Indonesia, the mobile vegetable vendors (Tukang Sayur) and traditional wetmarket vendors are on an unequal playing field when it comes to competing for customers with multinational supermarkets and hypermarkets. The corporatization of the food provisioning infrastructure in Indonesian makes it imperative to reframe the food waste narrative in order to understand the uneven playing field that results in increased food waste.

Unpacking how food waste is problematized and framed is critical as “the construction of the food waste problem actually contributes to the production of the problem itself” (Gille, 2013, 37). For example, one such construct is the way in which the issue of class power dynamics has been made invisible in food waste discussions in the global South. According to Gille, the economy is a place where value begets value but where value also begets waste (2013). An example of this is reflected in the increased consumption power of upper-income and middle-income groups, which often leads to the purchase of more foods, more varieties, and consequently more waste. FWR argues that the ability to shield oneself from risks (buying more food, buying more varieties, avoiding old/expired foods), while passing along to others the exposure to risks (for example: the impact of food waste for the waste pickers and lo- income
residents living near dumpsites, the gifting of old food to low income peoples), is a key source and result of power (Gille, 2013).

3.3 Uneven playing field: Modern Food Infrastructure versus Traditional Food Infrastructure

The inclusion of agriculture in free trade agreements and the trade liberalization and neoliberal agenda of Soeharto’s New Order (Orde Baru) eliminated the constraints on corporations to operate in sectors that were once dominated or subsidized by the public sector. This meant that Indonesia became a fertile frontier for the intensification of industrial agriculture and the corporatization of food infrastructure. While small to medium supermarkets have existed since the 1970s in Indonesia, they were primarily located in urban centres (Suryadarma, Poesoro, Akhmadi, Budiyati, Rosfadhila and Suryahadi, 2010). By the late 1990s, the government of Indonesia under President Soeharto had opened foreign direct investment in the retail sector and encouraged entries of foreign supermarket chains such as Carrefour and Giant (Suryadarma et al. 2010). In 1999, Presidential Decree No. 96/2000 approved Carrefour’s expansion of retail operations in Jakarta (Rangkuti and Wright, 2013). By 2005, 30% of the overall food in Indonesia was purchased in supermarkets (Natawidjaja et al., 2006 as cited in Reardon & Hopkins, 2006). With respect to sales, supermarket sales have grown at an average of 15% per year while traditional retail sales have declined 2% per year (Suryadarma et al. 2010; Reardon et al. 2003).

These hypermarkets wage price wars to win consumers and while having previously catered to the upper-class, they are now attracting lower income consumers (Suryadarma et al. 2010). In modern supermarkets, bulk offers and “buy one get one free” (beli 1 gratis 1) marketing have been blamed for encouraging more food waste (Stuart, 2009) due to people being encouraged to buy more than they need. This marketing system has been adopted by large Indonesian supermarkets. According to most of the respondents, the option to shop at supermarkets is a relatively recent one. As Joko (a middle-class respondent), noted with regards to the growth of supermarkets:
Before, the only supermarket was Gelael, so those who went there were the rich people, now that’s not the case. They are everywhere and when you shop at supermarkets, the products you get are cleaner and the price difference is quite small compared to traditional markets…

While foods sold at the wetmarket (pasar) or by mobile vegetable vendors are generally domestically-grown and seasonal (with the exception of some varieties of carrots and garlic), large supermarkets rely on large-scale food manufacturers as well as producers, which are often imported from multinational providers (Reardon, Timmer, Barrett and Berdegué, 2003). Non-seasonal foods distributed through long-distance food supply chains encourage more waste as they increase the opportunity for spoilage at every stage of the food supply chain (Mena et al, 2011). The changing scale of food production and food retail impacts and increases the opportunity for food wastage. According to Wiyono (2013), the Indonesian government views modern retailers as the primary driver for a growing consumption of imported agricultural commodities in Indonesia. Therefore, in a 2013 UU RI No.19 Law on Protection and Empowerment of Farmers, the Indonesian government sought to limit the expansion of modern food retailers that are not owned by or cooperate with farmer groups, association and cooperatives (Rangkuti and Wright, 2013). The implementation of the 2013 UU RI No.19 Law on Protection and Empowerment of Farmers may introduce penalties for importing agricultural products during local harvest time of the same products. However, according to the manager of a supermarket in the city of Bogor, which is very popular with the middle and upper-income respondents, the supermarket sells 80% imported food and only 20% local food. As the manager told me with respect to the choice of buying imported products:

The local fruits are seasonal and do not always fulfill our quality standards. We have standards and our quality must reach a certain level. This is because our customers are from the middle to upper-income class.
This aesthetic standard is now adopted as an integral part of the modern supermarket structure in Indonesia. The Director of a large hypermarket chain in Indonesia noted the importance of aesthetics as part of a “modern” store experience:

…the fruit display, the level of ripeness is important, because we are a modern store so aesthetics are important and we must pay attention to that. It has to be nice, attractive…

The widely popular European “Ugly Fruits and Vegetable Campaign” is an advertising campaign that was specifically developed to address the issue of food waste caused by supermarkets’ stringent cosmetic standards. In Indonesia, seasonal local fruits and vegetables are being rejected by the supermarkets for not meeting “aesthetic” standards. However, unlike the modern supermarket, the local warung (neighbourhood mom and pop shops) do not enforce strict aesthetic standards as they sell in small amounts to the local community. Low-income respondents who shop in the warung only have one or two varieties of fruit (usually local papayas, mangoes or bananas) and from an aesthetic perspective, these fruits may have blemishes or shapes that would be considered “undesirable” in a modern supermarket. Due to the strong ties and trust between the local community and the local warung, it is possible for the buyers to pay at a later date or barter for their food. These types of practices and the types of food sold at the warung would not be possible at a multinational supermarket which is premised on standardization and an economic model of industrial food system tied to larger global markets, investors and corporations. In essence, the infrastructure of food provisioning plays a role in influencing the culture of food and people’s relationship with food based on the experience connected to shopping, the food packaging design as well as the expectations for certain aesthetic standards.

3.4 Restricted Spatial Access for Traditional vendors

According to a study on the impact of modern retail and the profitability of traditional markets, the closer the distance of modern retail to the traditional market, the higher the probability of a decrease in profits from traditional wetmarkets (Maisari, 2014). While Presidential Regulation No 112/2007 and the
Ministry of Trade Regulation (MOT) No. 53/2008 attempts to regulate the size, ownership and distance of new modern outlets from traditional markets, the zoning rule regarding distance between modern retail and traditional wetmarkets is vague and lacks detail. The law (PP No 112 2007) simply stated that “the establishment of modern retail must consider distance between the hypermarket and the traditional wetmarket that existed before.” Secondly, this law does not consider traditional actors such as tukang sayur (mobile vegetable vendor)

Another consequence of the influx of modern supermarkets and the unequal regime of power is the marginalization of traditional vendors such as the tukang sayur. As a tukang sayur, Asep goes to the wetmarket (pasar) at 2 a.m. to buy produce and returns home to sort his goods in small plastic bags or in boxes. By 7:00 a.m., he does his neighbourhood rounds. According to Asep, who has been a neighbourhood tukang sayur since 1982:

> If we are talking about comparing my net income before and now, we’re talking about a huge difference. Since Giant* [*a multinational hypermarket chain] arrived, my net income now is much smaller compared to the past. It’s because of the price difference; the prices at Giant and the prices at the pasar are different. I need to make some profit to feed my family…”

Some tukang sayur could afford to “modernize” by leasing or borrowing motorcycles could then cover longer distances and therefore acquire more customers, but even their presence in some neighbourhoods has been restricted. As the tukang sayur comes daily, individuals can purchase just enough to cook for one day’s worth of meals which supports a “buy today eat today” practice and eliminates the need to stock up on food which may lead to wasted food. As a food provisioning infrastructure, mobile vegetable vendors are useful intermediaries that can prevent or reduce household food waste as they sell local foods from the wetmarkets in quantities that can easily be tailored to the customers’ needs or household size. Because households can buy smaller amounts from mobile vegetable vendors (for example: half a cabbage), the issue faced by the U.K. households in Evans’ (2011) study - whereby individuals are forced
to buy more foods than needed due to supermarket restrictions - can be averted. However, the *tukang sayur* only come in the early morning and with the growth of women’s labour participation in Indonesia (Utomo, 2012) and the constant traffic gridlock (*macet total*) facing commuters (Lee, 2015), a “buy today eat today” practice is becoming less practical in comparison to a once/twice per week “stocking up” grocery pattern. The pattern of stocking up is also made more prevalent with the overall growth of refrigerator ownership in Indonesia and in Asia. According to the Asian Development Bank (2010), the increase in purchase of refrigerators is one of the markers of a middle-class group.

As Asep (the *tukang sayur*) stated, it is challenging to deal with the rising cost of food as well as the difficulty of getting the upfront capital needed to buy the vegetables, all while competing with powerful players such as supermarkets. Accordingly, the food infrastructure offered by mobile vegetable vendors, whereby households can easily buy in smaller quantities may not be available in the future. In fact, for some households in elite areas, the option to purchase from *tukang sayur* has been eliminated. I asked Asep whether there are neighbourhoods that were off-limits to him:

There are gated areas that are closed off for us, for example Green Town and Pristine Enclave, those areas are off-limits...Because they [referring to the real estate/property management] have paid the security guards...the ones who forbid us from entering are the security guards

Suci (upper-income) who lives in Pristine Enclave is in her forties and lives with her husband, her son, a nanny, a domestic helper and the son of the domestic helper. Suci’s neighbourhood cluster is only accessible by car and is tightly guarded. There are two hypermarkets nearby, both located in shopping malls within the gated community, approximately 1km from her neighbourhood. In the middle to upper-income households, journeys to supermarkets are always conducted by car and very rarely by public transport or walking. Many supermarkets are located within large shopping centres or malls offering a one-stop shop for time scarce consumers. Large supermarkets are air-conditioned, cleaner, offer more

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3 The names have been changed to protect the identities of respondents’ who live in the area
4 Ibid
food varieties, are generally more expensive (although this is changing and depends on the product) and have longer hours. Because wetmarkets (pasar) have different operating hours (some opening from 9 p.m. to 2 a.m. and some opening from 2 a.m. to 3 p.m.) than supermarkets, and there is no fixed price (individuals can bargain), it can be inconvenient for busy individuals to shop there. These examples demonstrate that not only are traditional food infrastructures marginalized and, in some cases, restricted, but the patterns of food consumption have also transformed due to broader social changes. It is these unequal power relations between “modern infrastructures” versus “traditional food infrastructures” that are impacting urban food consumption patterns and influencing a food waste regime of increased risks for traditional food sectors.

3.5 Who gets to define what is food and what gets wasted? Food Preferences, Class and Risk

Unequal power relations are not restricted to food markets and infrastructure. Rather, at a micro-level (household level) it is important to understand the distinct dynamics between households of different classes and between employers and domestic helpers. Yulia (an upper-income respondent), who is in her fifties, lives with her husband, son and a domestic helper. She also employs a chauffeur and commutes to the capital city Jakarta six days per week often spending four hours per day commuting. Her pattern of food shopping is very different from the “buy today eat today” patterns identified in Parfitt et al’s study (2010). Yulia goes grocery shopping in Jakarta at a supermarket at least once per week although she admits that she often goes back mid-week to stock up again. The supermarkets that she patronizes offer premium products, such as organics, and Yulia told me that she frequently consumes organic rice and organic vegetables. Rather than shopping in Bogor, Yulia prefers to go to Jakarta where she feels that she can trust the quality of the product and where there are more varieties of organics. Studies of organic food demand in Bangkok, Thailand have confirmed the growing demand for organic foods in urban centres of Southeast Asia (Roitner-Schobesberger et al., 2008). While she is responsible for food shopping, she is currently
training a new domestic helper who just arrived from central Java. The helper is not yet able to cook foods that suit her taste (i.e. fresh healthy foods) and therefore Yulia feels that she is “forced to cook.” Yulia is very health conscious, saying that she usually eats salad for lunch and fresh fruits. Freshness is important and new foods must be served everyday:

I want everything fresh because everything that is fresh has good nutrition. Food that has been stored and reheated over and over is not that great.

This finding supports Evans’ (2011) study on the connections between health concerns and the generation of food waste. However, unlike in the U.K. case where households do not give or share their leftovers, in Indonesia, it is easier to pass along leftover foods due to the extreme income disparity. Since Yulia is focused on providing herself and her family with freshly made foods daily, she does not like to eat leftover foods, and having a live-in domestic helper who cannot take home all the leftover foods, Yulia said that she puts any leftovers in a plastic bag that is then refrigerated before giving it to the garbage collector first thing in the morning.

Cappellini and Parsons’ work regarding leftovers and family relationships (2013) argues that the sharing of leftovers is related to social proximity rather than distance. With respect to Indonesia (although not exclusively), it is not always familial proximity, but rather patron-client relationships between employers and employees which make it easier for domestic helpers or low-income individuals to be in a position of a “food waste infrastructure” for the upper and middle-class. While the sharing or gifting of food may in many cases demonstrate commitment to charitable acts, it is important to note that due to the power relations, the lower-income group (in some cases) do not have the power to refuse the food or to request a different option. In the global North, “food rescue” organizations have absorbed some of the food that would have been wasted by supermarkets and some innovative work on food sharing has allowed for strangers to share extra food with others in communal refrigerators (see foodsharing.de). However, in
Indonesia, the gifting of leftovers to avoid wasting food has largely been possible due to the extreme income disparity and unequal power relations. This practice of shifting the risk confirms Gilles (2013) FWR theory that the ability to shield oneself from risks and to be able to increase another’s exposure to them is a result of power (2013).

In my study, Joko (middle-income respondent) was the only male respondent who claimed to be mainly responsible for food provisioning. He is a retired businessman and his wife works as an executive. Their three children are in university and only occasionally come to live with them in Bogor. When asked about leftovers and whether it was common in his household to have leftovers he stated that leftovers mean that he has “failed in his cooking”. Consequently, he cooks “just enough” (secukupnya) each time and if he does have leftovers, he would throw them away immediately because he fears that animals might be attracted to the smell and he wants to keep his house clean. He also considers saving leftovers in the fridge as “unclean” so whatever his family cannot eat gets thrown out.

Many of the upper-income respondents have two refrigerators or a large double door fridge allowing them to stock up on more food. On my shopping “going-along” (Kusenbach, 2003) with respondents, it was common for upper and middle-income respondents to purchase items outside of their shopping list and perform what Wood defined as “discretionary unplanned buying” (2005, 268). According to Wood, “discretionary unplanned buying” is distinct from impulse buying and is arguably the hallmark of a “consumer society.”

Meanwhile, the low-income respondents have very limited budgets (approximately 5 dollars a day or less for the entire family) and in general do not need a list (as their purchase is small). They also rarely have enough money for discretionary food spending in comparison to the middle and upper-income respondents who routinely visit restaurants, coffee shops and bakeries. Upper-income respondents confirmed that they have issues with forgetting foods at the back of the fridge. It was found that
refrigerators (as a food storage infrastructure) may promote wasteful tendency and in some case increase food waste. One respondent in particular, Saskia, an upper-income respondent who live in an elite gated enclave, notes that her fridge is often overstuffed:

    I leave food too long in there [referring to the fridge] so then I forget about it. For example, in the fridge there are too many things piled on top of each other...then comes the realization [referring to her daughter] ahhh mom, there is still this, and there is still this.

In contrast to Saskia, on a tour of Hesti’s (low-income respondent) kitchen, her fridge is generally empty and is primarily used as a place to keep the water cold. Note that this is largely the case with all of the low-income respondents with the exception of a few eggs or some vegetables. See below for a comparison of upper and middle-income fridge and lower-income refrigerators.

![Figure 3a](image1.jpg) ![Figure 3b](image2.jpg)
Hesti’s refrigerator along with others of the low-income communities are not used for stocking up as they do not have the financial resources to stock up or consume a wide variety of foods. Within a food waste regime framework (Gille, 2013), the luxury of being able to stock up on food, or purchase more varieties results in more waste. This increase in waste is inextricably linked to power.

The lack of diversity in the diet of the low-income population in Indonesia is also similar to that of the West (Otero, Pechlaner, Liberman, and Gürcan, 2015). Tuti who lives with her husband and three kids aged 7, 11 and 16, resides in an informal village “kampung” adjacent to a middle/upper class neighbourhood across from a small river. She works as a laundry washer in a nearby middle-income neighbourhood and their combined family income is 5 dollars per day. Hesti also lives in the kampung and is in her forties. She lives with her five kids ages 7 to 22 and her husband who is unemployed. She is the sole-income earner and works three jobs, making anywhere between 100 to 150 dollars per month.

For grocery shopping, Hesti walks to a warung daily or buys from the tukang sayur when he passes by her employer’s house. Both Hesti’s and Tuti’s consumption is “buy today eat today” and sometimes they
do not have enough money. Hesti’s family eats instant noodles on a daily basis, and sometimes she can afford to add an egg for protein although she tries hard to buy vegetables and make soups. Like Hesti, Tuti also consumes instant noodles daily:

Almost every day, for example if the meal from lunch is all done, then we will definitely eat noodles later.

In the middle and upper-income households, instant noodle consumption is limited as they are considered to be unhealthy due to the high MSG content. It is also not considered to be a “proper” meal (see Evans, 2014 for examples on what constitutes a “proper” meal from UK households). However, in the case of Hesti and Tuti, instant noodles are practical, cheap, and a regular feature of daily food provisioning. The instant noodles are portioned for individual consumption and therefore food waste is non-existent. While upper and middle-income households stress “cleanliness”, “quality” and “healthy” foods as important considerations when shopping for food and emphasize the importance of serving freshly-made foods, the lower-income respondents are primarily concerned with affordability and practicality. This demonstrates that what is not considered a “proper” meal for the upper-income class, is a basic staple for the lower-income class as their choices are limited by a lack of income. It also demonstrates that the power to categorize “what is food” and “what is waste” is highly tied to class and power (Coles and Hallet IV, 2013; Gille, 2013).

3.6 Conclusion

By narrating the lived experiences of respondents from different class and income categories in the Indonesian city of Bogor, this chapter has demonstrated the importance of understanding urban food consumption and food wasting practices in the global South. The article reframes the food waste narrative by analyzing the impact of retail modernization in Indonesia and the resulting transformation of food consumption and valuation of food. The patterns of consumption occurring in Indonesia reflect a neoliberal regime of corporatization and deregulation, and demonstrate that there is a need for clearer
policies to protect traditional food infrastructures such as mobile vegetable vendors and wet markets. A combination of time scarcity due to work and commute, urbanization, as well as the increasing challenge to access traditional food infrastructure impacts the ability of households to maintain the “buy today eat today” practice. The growing upper and middle-income group, the increased variety in non-seasonal and imported foods, increase in food varieties and choices, as well as the demand for stringent cosmetic standards by supermarkets, necessitates a closer look at urban consumption and food waste in the global South.

As demonstrated in the case of Indonesia, food waste impacts the health of vulnerable communities in an uneven manner, as they do not have the resources or the power to shield themselves from the risks associated with the growing food waste and its associated packaging. Gille’s (2013) Food Waste Regime [FWR] illustrates the clear connection between power and the ability to define “what is food” and “what is waste.” The examples provided in this study on “who gets to define what is food and what is waste” between different incomes are pertinent as the creation of food waste is predicated on diverse sets of values that are tightly connected to unequal social relations, power, and class. Such values in the global South are converging towards a preference for corporate industrialized food production due to the influence of modern food provisioning infrastructures. Rapid urbanization also plays a role in changing patterns of food consumption and wasting by further detaching residents from the source of their food and surrounding agricultural land.

Finally, this chapter demonstrates that class and privilege are key factors influencing household food-provisioning and wasting practices in Indonesia and should be central considerations in the field of food waste study. By analyzing the practices of modern food provisioning infrastructure in Indonesia, this chapter critiques the status quo of global policy interventions which have focused on agricultural-stage food loss interventions while neglecting solutions that can improve food accessibility for the urban poor.
and better management of urban food waste in general. As a new frontier of research, this chapter weaves together the connection between decisions on spatial infrastructure and how access to privilege (i.e. capital, social resources) influences food consumption and food waste. This chapter calls upon scholars to conduct further research on the influence that modern industrial food chains and infrastructures have on urban food systems and food waste in Indonesia.
Chapter 4

Gifting, Ridding and the “everyday mundane”: The Role of Class and Privilege in Food Waste Generation in Indonesia

4.0 Introduction

Several studies conducted in industrialized countries have identified households as the largest generators of food waste (Parizeau, von Massow & Martin, 2015; Gooch and Felfel., 2014; WRAP 2011). In Canada, it is estimated that 51 percent of food waste originates from households (Gooch and Felfel, 2014). In the United States, approximately $165 billion worth of food is wasted with American households throwing out an estimated 25 percent of the food and beverages purchased (Gunders, 2012). Meanwhile, in the U.K. it was calculated in 2010 that 7.2 million tons of food and drink were wasted by households with 4.4 million of the total waste categorized as avoidable food waste (WRAP 2011). Accordingly, there are significant efforts at the international level through the Food and Agriculture Organisation (FAO) Save Food initiative (Gustavsson et al., 2011) at the municipal level, and within the regional level (for example, through the European Parliament waste directives) to prevent, reduce, and better manage the food that is wasted at the consumer level (European Commission, 2016).

Soma and Lee (2016) have called for more post-consumer food waste research in the Global South, bringing to light the role of the growing middle-class population, shift in consumption patterns toward modern retail, and the impact of urbanization on food waste generation. With the exception of studies on food waste in low-income households in Brazil (Porpino, Parente and Wasink, 2015), Romania (Stefan et al., 2013), and in South Africa (Oelofse and Nahman, 2013) most food waste studies and initiatives tackle the issue of consumer food waste from a Global North context. According to Soma and Lee (2016), the lack of studies on post-consumer food waste in the Global South is due to narratives that position the problem of food waste as post-harvest “food loss” in the Global South versus post-consumer “food waste”
in the Global North. These narratives are further premised on the view that the “food loss” problem in the Global South is largely due to inadequate modern production, storing and distribution infrastructure as well as “inefficient” farming (IMG, 2013) while in the Global North, it has been identified that food waste is a problem due to a culture of overconsumption.

This dichotomy of narratives leads to policy recommendations that promote primarily technological interventions to mechanize and further industrialize agriculture in the Global South, while focusing on consumer-based solutions in the global North. While studies of consumer food waste may explore drivers of food waste generation such as planning, attitudes, and shopping routines (Stefan et al., 2012), little is known about the practices around surplus food and food waste management by households employing domestic workers in the Global South. There are important social justice and policy implications from this study as solutions to reduce food waste and food insecurity often centre around promoting the charitable distribution of surplus unwanted food (often termed as “food waste”) to the poor (Lambie-Mumford, 2015; Mansfield et al 2015). This approach of passing along food to the poor through charity results in the state retreating from the duty to provide the fundamental human right to food and downloads this responsibility onto charitable organizations (Lambie-Mumford, 2015). Food waste solutions have also conveniently neglected issues of overproduction (Cloke, 2013). This stems from the mantra that more food needs to be produced to feed a growing population (Godfray et al., 2010; Gustavsson et al., 2011; IMG, 2013) even though there is currently massive food wastage and more than enough food is produced to feed the population globally (Holt-Giménez et al, 2012).

Countering the argument that “blames the consumer” and challenging the notion of a “throwaway society” (Cooper, 2005; Bauman, 2002), scholars such as Evans (2014) have argued that from a consumptive and social perspective, the generation of food waste is not ‘extraordinary’ nor is it due to some imaginary conspicuous consumption. Rather, according to Evans (2014), the passage of food into
waste occurs ‘as a more or less mundane’ consequence of the ways in which practices of everyday and
domestic life are carried out. In other words, ‘the passage of food into waste’ is considered to occur due
to quite ordinary domestic practices that are shaped by social and material contexts (Evans, 2012; 2014).
This chapter will attempt to contribute to Evans (2012) conceptualization by demonstrating the importance
of including discussions of privilege and class in determining the ‘mundane’ passages of ‘food’ into
‘waste’ in households, particularly in a developing country context such as Indonesia.

The first section of this chapter reviews relevant literature with a focus on describing the everyday
mundane food practices between households of different classes in Indonesia followed by an overview of
the research methodology. This is followed by an analysis of the practices of gifting, ridding of leftovers,
class relationships, culture and the notion of family memberships within a household unit in Indonesia.
The chapter then demonstrates that when privilege, class and culture are taken into account (especially
within one household unit), the generation of food waste in Bogor, Indonesia, in many cases, reflects
unequal social dynamics and injustice. In fact, some of the passages of food turning into waste in
Indonesian households (depending on whose perspective) may seem ‘extraordinary.’ As Gille argues, ‘the
ability to shield oneself from risk and to increase another’s exposure to same is a key source and result of
power’ (2012, 31). Therefore, understanding the unequal power structures that enable one to rid, move or
divest is key to confronting consumption and the generation of food waste. Sensitivity to the issue of
privilege is necessary to determine how households define what is “food” and what is “waste” and will
illuminate that the poor in Indonesia are often relied upon by the wealthy to absorb and manage unwanted
surplus food and leftovers.

4.1 The Everyday “Mundane”

Following Evans (2012a) seminal work on the conduits of disposal in household food consumption, it is
suggested that investigating the movements and placing that serve to configure food as waste (specifically
via binning, gifting and recovery) are vital to understanding consumption, disposal and waste. Evans drew upon ethnographic research from the U.K to investigate “the shifting contours and gradients that reduce the possibilities for disposing of food through conduits in which it can be handed down, handed around, or otherwise saved from wastage” (2012a, 1123). Fundamental to understanding the conduits of disposal, gifting, and recovery is the recognition of waste as a dynamic social category (Hawkins, 2006; Gille, 2007; Evans, 2012a). In his work, Evans also drew largely on the work of Gregson, Metcalf, and Crewe (2007) and their critique of the concept of “the throwaway society”. Gregson et al (2007, 682) argue that understanding how matters turn into waste requires an investigation and focus on “love relations and mobility” rather than on the trajectories of the matters themselves. Similarly, Evans (2012b) is highly critical of the “throwaway society” thesis and argues against a “myth of consumerism” inferred upon based on observations of the massive levels of waste generation. For example, in the case of several respondents Evans argue that they “needed to waste food” in order to make time to spend with friends or to eat ‘properly’ (2012a, 53) However, in the process of analysing divestment (Marcoux, 2001), “conduits” of food disposal based on “love relations” (Evans, 2012a; Gregson et al 2007), and investigating practices of “everyday life” (Evans, 2011), there is a general lack of consideration to investigate “who” are the conduits of disposal and whose “everyday life” accounts are potentially being privileged? Specifically, in regards to food waste, it is important to understand the process of ridding by interrogating to “whom” is food moved around and placed? Who gets to bin food and who eats from the bin? By asking questions pertaining to power and unpacking the concept of “ordinary” domestic practices (Evans, 2012b), this chapter provides a nuanced account of unequal everyday practices and domestic life as experienced by households of different incomes in Indonesia. With respect to food waste, according to Evans (2014, xv):
the passage of ‘food’ into ‘waste’ occurs “as a more or less mundane” consequence of the ways in which practices of everyday and domestic life are currently carried out, and the various factors that shape the prevailing organisation of food consumption (emphasis added)

While various factors that shape the prevailing organization of food consumption is recognized in the statement above, in focusing on “tracing the ways in which food becomes ‘surplus’” (Evans, 2014, 91), and the ways in which individuals “move things along,” it is important to analyze the role of class, power and privilege. It is critical that scholars investigate the “inequalities in the degrees of freedom with which different individuals and groups engage in food practices” (Maguire, 2016, 11). While Evans (2014) has clearly expounded that his U.K. based ethnographic research on food waste does not seek to offer explanations along the lines of class, household type, ethnicity or other social stratification, it would be problematic to try to explain the “conduits of disposal” without analysing the question of power. In Indonesia, power is a key consideration when investigating households of varied income and class. As food waste practices are socially and historically constructed (Evans, 2014) as well as naturally subjective, they should not be divorced from class-based analysis. As Colombino (2014) argues, the geographies of food production are often imbued with social inequalities, which are obscured specifically behind the consumption of food. In the field of geography, scholars have recognized how consumers might be partially responsible for the exploitation of workers and the reproduction of capitalism through their consumption (for example see Goodman & Watts, 1997; Hughes and Reimer, 2004; Kalra, 2004). Therefore, this chapter argues that it is important to analyze the issue of class and inequality in everyday domestic practices of food waste generation through the lenses of social justice.

This chapter will employ Gille’s (2013) food waste regime (FWR) framework. The FWR conceptual framework conceptualizes both food and waste as constituting social relations. Within the food waste regime (which consists of social institutions and conventions), judgements are made on what food
or waste are considered valuable, therefore regulating their production and distribution (Gille, 2013). The FWR framework also engages with the concept of the unequal organization of risks and uncertainty. In essence, the FWR framework demonstrate that “the ability to shield oneself from risks and to increase another’s exposure to them is a key source and result of power” (Gille, 2013, 31). While Gille (2013) employs FWR to analyze the issue of food waste by exploring cross-national and cross-scalar linkages that affect food waste at the farm level between different countries, this chapter employs FWR to consider the unequal power relations in ‘risk avoidance strategies’ (Gille, 2013), that are mobilized by individuals with different incomes, classes and power both within a “household” (the chapter will question some of the assumptions built into this term) and between “households.” Due to the subjective nature of defining what is food and what is waste, and in the context of interclass dynamics, (for example, between the owner of a household and a domestic helper working or living in the household) it is useful to re-examine everyday food practice through Gille’s (2013) food waste regime framework. Through the food waste regime framework (Gille, 2013) this chapter will demonstrate that certain practices of the “profligate” nature are based on power and an ability to shield oneself from risks while exposing others to it.

4.2 Culture and Food Waste

Indonesia is major food producing country and an agrarian nation. As an archipelago consisting of 17,000 islands, hundreds of ethnicities and with a long history of trade and colonization, Indonesia’s food culture is diverse and includes among others, the influence of Indian, Malay, Arab, Chinese, Indigenous and Dutch culinary traditions. Diverse faith traditions, with Islam (consisting of various sects) being the predominant faith in Indonesia, also influence what types of food and beverage products can be consumed (i.e. “halal”) and what is considered forbidden (i.e. “haram”) (for example: pork, alcohol, dog meat). This diversity of heritage, the numerous islands, the isolation of some tribes/ethnic groups, and the different religions make it difficult to pin point what is actually meant by “Indonesian cuisine” (masakan Indonesia). According
to Kubo (2010), Indonesians usually define cuisines in the country based on the ethnic group or the region where the food originated. An example of this would be identifying certain foods such as *Ikan Rica-Rica* (Fish with rica-rica sauce) as a “Manado/ Mihanasan dish” an ethnic culture found in North Sulawesi (Kubo, 2010). In the Indonesian Minahasan tribe - a predominantly Christian (95 percent) ethnic group originating in the Island province of North Sulawesi - community delicacies can include dogs, cats, bats, forest rats, snake and monkey (Weichart, 2007). These Minahasan delicacies would be considered inedible/non-food products by the predominantly Muslim Sundanese and Javanese ethnic groups. Sundanese cuisines largely consist of raw vegetables or blanched vegetables commonly eaten with *sambal*, a spicy hot sauce made of shallots, tomato, red thai chili, garlic and *terasi* (a pungent smelling paste made of ground fermented shrimp).

The line between foodstuff and food waste is not clear-cut. As Coles and Hallet IV (2103) argue, the example of the consumption of salmon heads by some and rejection by others illustrates how “food” becomes “waste” and “waste” becomes “food.” This process of drawing the line between food and waste can be contested, transgressed or replicated by the market and by society (Coles and Hallet IV, 2013). The authors argue that “consuming salmon produces salmon heads, and this waste goes somewhere” (Coles and Hallet IV, 2013: 168). For example, in a high-end food market in London, U.K., salmon heads are valued only for decorative purposes (to decorate the fish stall) but are thrown out when the market closes (Coles and Hallet IV, 2013). Meanwhile salmon head is a delicacy in many countries and is often made into soups (Coles and Hallet IV, 2013). In Indonesia, this delineation of “food” and “waste” can be seen in the case of offal. When I asked Joko (an upper-class respondent) about offal, he narrated his experience as a young man working in a restaurant while studying in North America:

A long time ago in the restaurant where I used to work, the chef at the restaurant was about to throw away the offal. I told him that I wanted to take it home for my cat. It was actually for me (laugh).
Interestingly, Joko felt somewhat ashamed to say that he wanted to consume the offal for himself. There was an unspoken understanding that the offal was considered “rubbish” and not acceptable for human consumption in the U.S. This exemplifies the dynamic between culture and food waste. The disruption of a linear trajectory between the passage of food into waste as exemplified by the act of Joko lying to prevent the offal being thrown out is often connected to place and act of place-making (Coles and Hallet IV, 2013). The act of place-making with respect to food is not limited to geography, it is also an act of placing someone within a hierarchy of power to either choose to accept, or to bear the burden of risk through societal stigmatization. An example of this societal stigmatization is illustrated in the case of Indigenous children in Canadian residential schools being mercilessly teased as “gopher eaters” and having their foodstuffs deemed “uncivilized” (Fee, 2009). The stigma is also experienced by some food bank users around dependence on food aid (Purdam, Garratt and Esmail, 2015). Compare Joko’s experience with Wulan, a low-income respondent who was enthusiastic and not at all ashamed about her consumption of offal. Considering that warung (small neighbourhood shops) are mostly relied upon by low-income respondents for daily shopping and it does not sell beef, chicken breast and more expensive cuts of meat. Consumption of offal is readily available and accepted in her community:

   It’s my hobby! I eat liver, gizzards…I fry it, pickle it, I make intestines with a yellow [turmeric] sauce and with red spicy sauce.

The availability of certain foodstuff in warung in comparison to modern supermarkets is also a form of place making. This example demonstrates the difficulty in defining food waste as what may be considered waste by a different culture or by a different class is considered food by another.

   For most Indonesians rice is a key staple food. The cultivation, harvesting and consumption of rice are entrenched in the Indonesian (especially Javanese and Sundanese) cultures of dance (e.g Harvest Dance), ceremonies, mythology and cuisine. It is a common saying in Indonesia that if you have not consumed rice then it feels like you have not eaten “kalau belum makan nasi, rasanya belum makan.” The
A moral connection between food, culture, and waste is also tied to the popular Indonesian folktale of “The Crying Rice” (Nasi Menangis) (Soma, 2016). According to this folktale, a farmer had just finished harvesting rice and heard a crying sound coming from the field. When she looked around, she found that the source of the sound was a handful of unharvested rice plants left behind during the harvest (Soma, 2016). Women in Bogor, Indonesia would still recount this tale to admonish their children not to waste food. For example, Atheera mentioned that she often uses the story of the crying rice stating, “please clean up your plate, if not, the rice will cry” to encourage her grandchildren to eat their food. The story is a traditional representation of Indonesian values placing respect on the land, labour of the farmer, and food. By wasting the rice (which symbolizes the most important food source), there is a symbolic “emotional pain” caused to the land, the natural resources (water), and the farmer. However, as the urban population becomes more detached from agricultural sites, the emotional connection to the farmer’s labour and the land become less relevant.

4.3 Indonesian households as a complex unit of analysis

Focusing on the household as a primary unit of analysis for food consumption was established when Home Economics became an academic field of study (Niehof, 2011). Both Evans (2014) and Bulkeley & Gregson (2009) argue that it is important for studies to empirically engage with the household as the primary unit of consumption. It is argued that by doing so, policies to prevent and reduce waste can avoid assumptions about how food waste is generated based upon mere ‘conjecture’ or ‘common sensical’ explanations (Evans, 2014; Bulkeley and Gregson, 2009). Before engaging with the “household” it is important to understand what “household” actually means by fully defining the term (Niehof, 2011) and its context.

Equating households with a bounded system is problematic as it entails exclusion and inclusion and may not reflect what is happening within the household or how it changes (Niehof, 2011). From an
Indonesian perspective, there are more fluid and adaptable “boundaries” such as large kinships. Accordingly, it would be most fitting to follow Wallman’s (1986) concept of “household as process”, which means that household membership can be transitory rather than fixed and may consist of those outside of family units (e.g. domestic helpers, employees). The global application of household food waste prevention and reduction strategies that are derived from a Western context can be problematic because as Wallace (2002) notes, there is an assumption that the household/family unit is a “unified actor.” Furthermore, achieving the goals of “wasting less” may simply mean that there is enough extreme income disparity such that “waste” can be shifted to people who have little or no choice but to consume or utilize said “waste”.

My research found that “members” of a household in the Indonesian context go beyond the nuclear family and include extended families (even those families living outside the house) as well as workers residing within the household. Therefore, in the Indonesian context, “household” can mean something very different than it does in the European or North American context. One respondent Atheera (an upper-class respondent) at the time of the study had 13 people including extended family members and workers living and eating in her house after the passing of her husband:

There are 13 people eating here consisting of the core family of 6 people, myself, my kids and the grandkids. There are two domestic helpers, one working part-time and one live-in. Then there are 3 drivers (chauffeurs), 2 are full time and one part-time… Then there are the construction workers too, 2 people.

When Atheera talks about food consumption in her house, she practices what Coles and Hallet IV (2013) refer to as “place making”, by identifying the staff within the household with the term “orang belakang” (literally the “back people”/“the people who stay at the back”). In a social/class hierarchy, the core family is seen as being placed at the front (di depan) or sited at the centre of the house thus demonstrating the stratification of power within a household. Although this is not always the case in every household, the
domestic helpers in this study do not generally mingle with the rest of the household. With the exception of professional duties related to doing work in the centre of the house, the helpers largely remain at the back (di belakang) of the house where the kitchen (and usually a small room for the domestic helpers) is situated. When they are at the back of the house, they are usually eating, resting or working but they are “out of sight,” hence the term “orang belakang”:

For example, if we cook a portion of food, later we [referring to the core family] would eat together, there would be leftovers. Then, that leftover can obviously be finished by the back people (orang belakang), they will eat it too. Then if there is still leftover we can give it to those “other people” (orang kaya gitu-gitu)

When Atheera mentioned giving the last remaining food to the “orang kaya gitu gitu,” or grammatically “orang seperti itu,” she was referring vaguely and colloquially to “those types of people.” More specifically, she is referring to a category of poor people who are assumed to be poor enough that they would accept any type of food donation (e.g. wastepickers, beggars). It is important to consider these prevailing assumptions in the process of investigating conduits of disposal. Tarasuk and Eakin (2005) point out that this assumption (i.e. that the poor will accept any kind of food) is also seen in their study of donations of low-quality foods to food banks. Another example of problematic assumptions on food donations is the issue surplus food dumping in the guise of “aid” (OXFAM, 2005). This “food aid” actually hurts farmers and causes waste by forcing the farmers to leave their farms unharvested (OXFAM, 2005; Gille, 2013). Many of these assumptions are based on the idea that the poor are desperate enough that they cannot or do not have the right to choose (Maguire, 2016). Within this unjust systemic framework, even when donated food is consumed or given, there is a lack of choice and more importantly, there are many unintended consequences as will be noted later.

Another upper income-respondent, Indah, counts seven people in her household. However, four of these people (her son, daughter-in-law, and two grandchildren) actually own their own separate house around the corner. Because they routinely eat at her home and the parents work long hours, Indah (the
grandmother) takes charge of the food provisioning role with the help of the live-in helper. Although she does some minor grocery shopping, her daughter-in-law does the primary shopping and then the food is cooked in Indah’s house. They live in different houses but when analyzing their food consumption practices, they are considered one household unit.

The common practice of having a large number of extended family members and workers (whether they live in the household or not) makes household food waste studies in Indonesia more challenging. There are times when everything from kitchen appliances to food sources are shared despite respondents coming from two separate houses. Basically, the food and appliances along with the labour of the helper are seen as common property. In analysing the material infrastructure of food provisioning (fridge, kitchen and stove) Indah can go to her daughter-in-law’s house and take food from her fridge and her daughter-in-law can do the same. However, despite the domestic helper being part of the household and living in the household, she does not have the same right to choose whatever she wishes to eat from the fridge. Therefore, household hierarchy influence food provisioning practices. It is important to note that membership in the household does not entail equality and can often reproduce social inequalities. In the case of Indonesia, it is expected that the “back people” or “orang belakang” will be able to finish or sacrifice their own desires to finish whatever leftovers that the “orang depan” (core family) leaves behind or at the very least, they can move it to other people in the lower hierarchy (orang gitu gitu) to take it out of sight.

4.4 Gifting of Food in the Upper Class: “Something New”

According to Swilley, Cowart and Flynn (2014), gifting refers to the act of giving something to someone else without an expectation of compensation. However, gift giving is also a tool to strengthen relationships, honour a person’s status and acts as a form of market exchange (Swilley, Cowart and Flynn, 2014). The Maussian model of gifting demonstrates, that people, objects, and social relations are created
and recreated in different ways when people transact in gift and commodity relations (Carrier, 1991). Gifts may also be a way to elevate the gift giver’s status in the eye of the receiver (Sahlin, 1972). Unlike the Native American practice of potlatch, which is tied to the redistribution of wealth and the sacrifice of a leader’s wealth to his community to gain respect (Swilley, Cowart and Flynn, 2014), gift giving motivations differ and can be altruistic or agonistic (done for the personal satisfaction of the donor) (Sherry, 1983). Gift giving within upper-class Indonesian communities is often connected to status. The more status a recipient has, the more gifts he/she will get. The giver of the gift might be doing so to gain favours and, according to one of my respondents, this is becoming a potentially dangerous practice as it could be associated with bribery. According to Mauss, gift transactions can define the giver and recipient’s obligations to one another (Carrier, 1991) and the concept of gifting to gain favours was supported by results from the interview with my respondent, Joko. I asked Joko if he received food parcels during the recent Eid:

Author: Did you get cakes?

Joko: No, the ones who get gifts parcels usually have jabatan. Actually, I am the one that gives to them [high profile people] because I have some needs from them. But now we’re not really allowed to give parcels to the government, so I gave a little last time but I was scared.

Author: Scared because it might be considered bribery?

Joko: Yes, it’s common for me to give to the departmental head, but then with the new rule I got scared. So we’re not allowed to give gifts whether it is for local government or central government. It’s actually nice to have a gift giving culture. I guess if you are sincere about the gift it's no problem.

According to Godelier (1999), the act of gift giving shifts the power between the giver and the recipient, with the recipient often becoming indebted to the giver, which then creates a cycle of gifting and counter

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5 Jabatan is a term associated with high status bureaucrats/ public figure jobs (example, mayor, government minister, governor).
gifting (as cited in Swilley, Cowart and Flynn, 2014). The issue with the practice of gift giving food parcels lies in the fact that excessive amounts of food (excessive in the sense that the amount of food cannot be consumed by the actual recipient) are gifted to people of power. As Joko personally observed:

My aunt’s husband is pejabat [leading government figure], he got so many cakes whether it is fresh cakes or cookies in container. So many. I saw with my own eyes how those cakes got spoiled…why were they not gifted? I think they think it looks nice, oh this one looks good, oh this is nice, at the end, all of the food was kept but not eaten…

In the upper-income households, food gifts are characterized by “new food”, which certainly excludes leftovers and second-hand foods. Food gifts are also characterized by abundance, quality, rarity and high value. This demonstrates that new food, favours and resources often end up in the hands of those whom are privileged. In Indonesia, the gifting of new food mainly goes to those who already have significant financial resources and do not need the additional food. In essence, not only do those with power get first choice, but they also have the privilege to choose varieties of food and waste them without dealing with the risk of hunger. On the other hand, the passing of food from upper-income households to low-income households and domestic helpers usually involves leftover foods (i.e “ridding”).

Nani a live-out domestic helper reflects on the practice of food gifting from the perspective of a worker within an upper middle-income household. Nani works for Mrs. Yuda in a household consisting of eight people. She speaks about the amount of food gifted to her employers who are both well connected and hold reputable positions in the capital city. Nani works with two other helpers and her main role is to cook and shop for food:

During Eid there were people bringing cakes, Mrs. Yuda was gifted with cake, Mrs Yuda’s mom was gifted with cake, Mr. Yuda was gifted with cake. Food was coming from everywhere. But most are not going to be eaten. Mr. Yuda doesn’t really like cake. Their oldest daughter would eat it on the first day only, and maybe on the second day. All the cakes would stay in the fridge until they are very hard. I’m always afraid that the cakes will get wasted. It’s mubazir [wasteful]
During my observation in the home, I noted that the cake portions were large with a single cake potentially serving approximately 20 people or more. These cakes were stored in Mrs. Yuda’s and Mr. Yuda’s two large refrigerators. In the second refrigerator, there were three cakes of the same size with approximately sixty servings for a household of eight people. It is common for most upper and middle-income respondents to possess either a large double door refrigerator or multiple refrigerators (Soma and Lee, 2016). I was offered a cake and tasted one (which was unopened) that had turned sour. As noted by Freidberg (2010), the growth of refrigerator use has promoted overconsumption and the ability to store more varieties of food.

In her interview, Nani (domestic helper) constantly emphasized the term *mubazir* and was distraught with the amount of food wasted at the Yuda household. The Arabic term *Mubazir*, meaning “wasteful/extravagant” is connected to the Islamic teaching forbidding wastefulness (Soma, 2016). In Islam, it is considered a sin to be wasteful and extravagant (Soma, 2016). Respondents who strongly hold this value use the concept of *Mubazir* to find various ways to prevent or reduce food waste. According to Icha (a middle-income respondent) and a lecturer at a university, her understanding of *Mubazir* encourages her to be more careful with portioning:

*Mubazir* means that food should not be wasted. This is why I do our best to cook just enough for the family.

The following pictures show examples of gifts given to the upper and middle-income households.
Figure 4: A fruit gift parcel in an upper-income respondent (a). Moldy Java Apple (Jambu air) (b). Eid gift parcel in a middle-income household (c).

An example of an Eid/Ramadan food parcel gift can be seen in the photo on the right, although depending on the status of the person, it can contain more food or less. On the left, a household was provided with a fruit basket. Note the big bunch of Pisang Tanduk (Horned banana) at the bottom that is becoming very ripe. While this house employed several domestic helpers, the fruits were just kept in the basket at the corner of the house rather than being distributed to the helpers. In general, the helpers do not ask their employers whether or not they can take surplus food, although, in many cases they would alert the
employers that food is about to go bad. The final decision on what to do with the food still rest with the employers. The situation faced in the Yuda household is similar to Joko’s complaint about his aunt who keeps everything because it looks nice. As shown by the picture in the middle, the Java Apple (Jambu Air) fruit from another household’s gift parcel had become moldy.

4.5 Ridding Food to the lower class: “Something Old”

While food gifting in the case of the upper class refers to giving “something new”, this is not necessarily the case with giving to the poor. Currently, initiatives to address food waste in developed countries have been based on the well-established and well-endorsed “food recovery hierarchy” model (Mourad, 2016). This model prioritizes the most appropriate responses to manage surplus food by ranking food waste management practices. The top level of the hierarchy promotes: 1) source reduction; followed next by 2) feeding hungry people; 3) feeding animals; 4) industrial uses; 5) composting; and finally, the least preferred option 6) landfilling (EPA, 2013). The idea of reducing wasted food by feeding hungry people is especially promoted by the U.S. Environmental Protection Agency (EPA, 2013). If the practice of feeding hungry people as promoted by the recovery hierarchy model is considered best practice in the arena of food waste prevention, how would this practice translate to the individual household unit between a high-income employer and low-income helper? Is the practice of the upper-class household ridding leftover food to domestic helpers considered a dignified way to prevent food waste? Perhaps, if in fact there is an element of choice. However, the question of power dynamics should also be considered.

As opposed to the “gifting” of new food to the upper-class, food practices by the upper-class often involve the “ridding” of leftovers or unwanted surplus to the lower class. In a sense, it is passing along an item that is no longer wanted or what one might term “ridding”. While this does reduce waste at one stream (specifically, preventing an object from being landfilled for a particular point in time), it does not reduce consumption at the upper-class level. According to scholars such as Munro (1995) and Gregson
et al., (2007), there is a distinct geography to the processes of revaluation and in this particular case, meal revaluation. Essentially, disposal can be defined as a process of “moving things along” conduits of disposal (Gregson et al., 2007; Munro, 1995) which is relevant in the practice of giving leftovers to the poor.

Cappellini and Parsons examined “the practices of revaluing leftovers as a specific conduit of disposing of food surplus” and giving food a “second chance” in Britain (2013, 121). They argue that the reuse of leftovers involves sacrifice by individual family members for the greater good of the whole family because it is no longer fresh (Cappellini and Parsons, 2013). Cappellini and Parsons, also argue that eating and reusing leftovers involves collective sacrifice that marks their membership in the family unit (2013, 121). However, the notion of “sacrifice” becomes problematic when applied to the case of domestic helpers in Indonesia and also takes on a different nuance in terms of marking membership in the family unit. Based on the unequal power relations between employer and domestic helper, the eating and reusing of leftovers perpetuates and replicates the identity of the lower-income group in Indonesia as being a conduit for disposal rather than as a member of the family. In some cases, it also sacrifices the poor for the continued patterns of overconsumption by those who are privileged. So the question then becomes, who has to be sacrificed for the “good” of the family?

From a spatial perspective, the bodies of the poor and lower-income households become dumping sites for food no longer wanted by the upper-class. It is important to note that the giving of leftover or unwanted food is generally premised on an altruistic rhetoric of care and a sense of charity for those less fortunate. The distinction between gifting and ridding food becomes quite blurred depending on the relationships of those involved. Nani, who is a domestic helper, talks about the leftovers she routinely brings home from her employer. Her own daily household food budget is between 20,000 to 25,000 Rupiah (approximately $2-$2.5 dollars per day). Coming from a low-income household, Nani talks about
her neighbor who is in a worse position. She explains that this is the reason why she would accept almost any type of leftover food from her employer as it can be shared with her neighbor:

It’s a pity to waste food. At home [referring to the employer’s home] there is usually extra soup. It’s a pity if wasted. In my village, there are lots of people with very little money. My neighbor has 9 kids in the village. The husband works as an informal construction worker so when he works he works, but he doesn’t always have a job. In the morning if I have leftover rice, his daughter would pass by, I say “hey [name] come, there is rice from last night and there is soup”, even if it’s only one bowl, she would be happy. There are lots of people who are facing more hardship than me.

It is critical that scholars do not interpret the food practices of low-income households as “liking what is affordable and readily accessible” (Maguire, 2016). In the figure below, miscellaneous leftovers have been set aside for a domestic helper after a period of cleaning the fridge to make room for new foodstuffs.

![Miscellaneous leftovers for domestic helper from a fridge cleaning in a middle-income household.](image)

**Figure 5**: Miscellaneous leftovers for domestic helper from a fridge cleaning in a middle-income household. Photo: by Author

When interrogating the question of who eats “from the bin”, Budi (the neighbourhood waste collector) stated, “yes waste pickers will consume food that is dumped, for example, oranges and bread.” From a health risk perspective Budi recognized that in some cases, households would spray their waste with
insecticides to prevent pest infestation. Therefore, waste pickers and collectors may be exposed to toxins from consuming food that have been sprayed. The disproportionate burden of health risk is felt by Nani as she spoke about taking rice that has already gone bad/sour (basi) from her employer’s house. The following example demonstrates the resourcefulness of Nani’s neighbour in dealing with food that has gone bad as well as the discomfort that Nani feels in shifting potential health risks from food that had gone bad to her poorer neighbours:

For example, yesterday there was a lot of leftover rice at the house [employer’s]. I offered it to the other female helper and she didn’t want it. The other male helper didn’t want it. I offered it to them first. Then, I took it home because they didn’t want it. Once I got home I checked if there was rice at my home. There was little so then I took a portion and then I called the daughter of my neighbor. I told her, “hey there is some rice.” Even if it is rice that has gone bad, I will take it home and give it away. My neighbor will then wash the rice. She will then steam the rice again with bay leaf, lemongrass and salt, so it’s like nasi uduk. So even if the rice has gone bad, it will be washed. It’s a pity I cannot give her something better.

The example of Nani (low-income) taking rice that has gone bad from her employer’s house for her less fortunate neighbour demonstrates that while such solutions may be altruistic and alleviate immediate hunger, they are not sustainable, nor do they adequately address the issue of poverty, food insecurity or overconsumption. It is also important to differentiate Nani’s act of giving old rice to her neighbour, from the routine ridding of unwanted food by her employers. Nani is also a low-income respondent who regularly consumes leftover foods given to her. In comparison, when I asked Puspa (an upper-income respondent) if she experiences cases where leftover food goes bad, her response was telling:

I have a domestic helper who goes home so she takes it. I prefer domestic helpers who go home because they can take leftovers from last night, as long as it is still in an acceptable state and in an acceptable container (emphasis added)

Interestingly, Puspa considers her hiring of a live-out helper as a tool for food waste prevention. She is unwilling to utilize the leftovers and circulate them within her family (although she is careful to make sure

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6 Nasi uduk: a savoury Indonesian rice dish usually made with coconut milk
that the leftovers are “acceptable”). In this case, there is a combination of social risks and health risks and Puspa mentioned that she has some anxiety about giving away leftover foods, as she has heard people criticizing others for giving away leftovers. This example demonstrates that Puspa is not callous nor is the act of wasting food treated lightly by most respondents (Evans, 2014). However, as Gille argues, “the ability to shield oneself from risk and to increase another’s exposure to them is a key source and result of power” (2013, 31). In this sense, Puspa’s household reflects Simone’s work (2004) on “people as infrastructure,” as it relies on the domestic helper as a form of “food waste infrastructure” and as a conduit of disposal to prevent/reduce the wasting of food. Puspa’s rationale and insistence on hiring a live out helper means she acknowledges that her consumption patterns lead to surplus or waste. As she is unwilling to consume leftovers, she is also faced with the moral dilemma not to waste. Therefore, her patterns of consumption can only be supported by a lower income group that would be ready and willing to receive the surplus.

In terms of risk, there were times when Puspa was gifted food by friends and was afraid of consuming it for health reasons, so it was re-gifted to the helpers under the rationale that lower-income people are not as concerned with health issues:

Perhaps for my class it is a problem but for the low-income class people it’s not a problem…with gorengan, it’s wrapped in a sheet of newspaper, and the fried foods are hot when it’s put in the newspaper wrapping, then the ink will stick and its carcinogenic.

As she believes that the ink taints the food and is carcinogenic, she will not consume the food. However, she noted that this worry might be a problem only for her class and not necessarily for her domestic helper or the lower-class group as she felt that they would be open to consuming the food. The ridding of leftovers often results from the perceived health risks with eating food that is not fresh and is conducted with social anxiety and awareness of the social “risk” as Puspa feels that there is some shame associated with gifting

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7 gorengan: deep fried snacks usually plantain, tofu, tempeh, sweet potato covered in batter.
“old food.” Nevertheless, she also understands that her consumption patterns and the food gifting patterns of her class create a lot of excess unwanted food. Hence, she has made the active choice to hire someone who can go home and take the leftover food.

### 4.6 Conclusion

This article has demonstrated how the passage of food into waste is a complex process that is intertwined with the broader food system and societal structure. Failing to consider the concepts of food justice and class in household food waste analysis would be a disservice to marginalized groups such as domestic helpers, and those who require food assistance including food insecure populations. The study has provided examples from Indonesia that contributes to a class and culture-based analysis of household food waste and consumption practices. It is important to emphasize that the food consumption patterns of upper income-people (especially in the case of gifting) generate a significant amount of leftover/surplus food. However, to reduce the amount of food that would have been wasted, the risks are shifted (Gille 2013) to the poor. Upper-income consumption patterns are reliant upon the domestic helper or a lower-class group (*orang belakang*) absorbing the unwanted foods and in some cases, “ridding” to the lower income helps to assuage the anxieties around wasting food. In Chapter 6, I will demonstrate other examples (see Yulia’s case) of how upper-income household rid leftover foods to other members of the community including waste collectors as they prefer newly made fresh food every day and find consuming leftovers to be unhealthy. By demonstrating the food gifting practice of the upper-class, which leads to excessive wasting, and the utilization of the low-income group as conduits for food disposal, this chapter has shown that the existence of a large amount of food waste within a household while others have to consume rice that has gone bad is based on structural and systemic inequality. Several questions that scholars should pose are: What are more sustainable and systemic ways to help food insecure communities? How can one establish a just food system that can reduce food waste without focusing on
the diversion of surplus unwanted food to feed hungry people? An agenda to prevent food waste cannot simply promote the feeding of surplus food from the upper-class to the poor, but rather must engage in broader social reforms around justice, wealth distribution, land distribution and food distribution. There is an important role and responsibility for the upper-class population and households to also reflect upon their privileges and as Princen (2002) argues, confront their consumptive practices.

It is important to take into account the interclass dynamic within the household unit and the varied income-levels. Many in the upper-class and middle class have good intentions to help, while many of the poor appreciate the direct impact of hunger alleviation from the food that was passed along. However, it is important to develop sustainable solutions that involve empowering the poor in the decision-making process. Accordingly, acknowledging the existence of unequal power is important as it makes consumers responsible for not only the production of the things they consume, but also responsible for what sometimes happens to make the waste they generate “go away” (Coles and Hallet IV, 2013, 170). To only look at ridding as a process (Gregson et al. 2007) without questioning the act and the power behind the ability to “rid” is problematic, as it does not question the actual social, environmental and economical impact of the ridding process itself. This chapter demonstrates that in some cases, the gifting practices in Indonesia, especially when done to seek favours, reinforce status and not to distribute wealth equitably with those who actually need food and resources, exemplifies a type of “conspicuously wasteful” and exclusive society. It is therefore critical to question the role of class and privilege at the level of household food waste generation to confront the broader societal systems that perpetuate the wasting of food. This will help ensure that dignity and social justice are considered in food waste prevention and reduction strategies globally.
Chapter 5

Wasted Infrastructures: Urbanization, Distancing and Food Waste in Bogor, Indonesia

5.0 Introduction

On the 21st of February 2005, 143 people from two villages predominantly inhabited by waste pickers and their families were killed after being buried by a garbage avalanche at the Leuwigajah open dump in Indonesia (Lavigne et al. 2014). The fatal garbage tsunami was the result of an explosion caused by trapped methane gas (resulting from decomposing organic/food waste). Methane is a greenhouse gas estimated to have a warming potential twenty-five times more than carbon dioxide (Gooch et al., 2010). The explosion shook the core of the garbage mountains and destroyed the villages located one kilometer away from the tip of the mountain. Waste-related issues in Indonesia have been further exacerbated by the fact that there is a lack of regional planning considerations to deal with the increasing solid waste (Silver, 2008). The issue of food waste is especially becoming a growing concern.

As planners are increasingly engaged in addressing food systems issues (Soma & Wakefield, 2011), it is important for the profession to understand how urban development priorities can lead to increased inequalities. The lives of the informal waste pickers (many of whom were youth) killed across Indonesia (Humaeni & Widjaya, 2010), the environmental degradation caused by an immense amount of non-biodegradable food packaging waste, and the stench of rotting organic waste represents the ‘collateral damage’ of modern industrial food production and consumption. The city seems to be ‘nothing more than a space for consumption in which we apparently express ourselves as citizens of a consumer society’ (Miles, 2010, 1).

This chapter investigates the role of urbanization as a distancing process on food consumption and food waste in Indonesia. The structure of this chapter includes a synthesis of existing literature and new findings from the fieldwork. The chapter seeks to answer the following questions. First, how does
urbanization impact food consumption and food waste infrastructure for people of different incomes? Second, how are residents of various incomes managing food waste and associated packaging? The chapter will examine these questions by exploring two related infrastructures (food provisioning and food waste infrastructure) through the conceptual framework of distancing (Princen, 2002, Clapp 2012; 2002).

The process of distancing enables the reproduction of unjust practices with respect to food consumption and the impact of food waste on marginalized population. Distancing as defined by Princen is ‘...the separation of primary resource-extraction decisions from final consumption decisions’ (2002: 157). According to Princen, the greater the distancing on any several dimensions, ‘the greater the likelihood that ecological feedback will be severed and resource overused’ (2002: 157). By investigating the ways in which rapid urbanization impacts the food system in Indonesia, it argues that urbanization causes a distancing process that results in a more complex long-distance food supply chain and presents significant challenges to the sustainable management of food waste. Not only is distancing connected to space, it also affects patterns of consumption and wasting by reducing access to the information needed to make informed choices. This is due to the ‘gap in knowledge we have about the social, ecological, and economic relationships associated with the foods we eat’ (Clapp, 2012: 2). Within the conceptual framework of distancing, two themes emerge from this study: spatial distancing via urbanization and the mental distancing of food and its associated waste. In Indonesia, rapid urbanization is a key factor in the distancing process and produces an unjust system whereby waste is distanced from those who are privileged and brought near to those who are poor. The chapter will conclude by providing recommendations to improve the management of food waste in the City of Bogor, Indonesia.

As Clapp (2002) argues, ‘consuming’ is a practice in the generation and distribution of waste. The distancing of food production from consumers in Indonesia has been catalyzed in the 1990s through Foreign Direct Investment (FDI) via corporate food retailers (Suryadarma et al., 2010). FDI by
transnational corporations in the food and agriculture sector has intensified significantly (Clapp, 2012) with penetration into developing countries by companies such as Carrefour and Tesco initiating a ‘supermarket revolution’ (Reardon and Hopkins, 2006). The corporatization of food retail through a long-distance food supply chain has facilitated the distancing of food by reducing it to a mere commodity and reducing ‘eaters’ to ‘consumers’ (Clapp, 2012,17). In 1994, FDI in Indonesia allowed the entry of 100% foreign-owned capital without any minimum investment and in turn attracted foreign ‘footloose’ industries (Firman & Dharmapatni, 1995, 173). According to Dyck, Woolverton and Rangkuti (2012), between 1999 and 2009, the number of supermarkets in Indonesia increased by 67%, with 75% of the supermarkets owned by multinational corporations.

There is a direct relationship between urbanization and the increase of modern grocery retail penetration (DBS Bank, 2015). This process of food distancing stretches the scope of transactions between individual consumers and farmers, food supply and demand, as well as pricing (Clapp, 2012). According to a recent World Bank report, in industrialized Asia, 17% of food is wasted at the production stage, and a significant amount of food (46%) is wasted at the consumption stage (Lipinski et al., 2013). In Southeast Asia, it is projected that as incomes increase, city dwellers will not only demand more food, but also more varieties (Teng & Trethewie, 2012). Consumer demand for greater variety of food is another driver of food waste and is exacerbated by long distance supply chains promoted by modern supermarkets.

5.1 Supermarkets, Food Waste and Distancing
The distancing process of the food system in Bogor is outlined by Ayu, a low-income respondent who experienced a decrease in food security due to the loss of land caused by rapid urban development:

Before I used to grow cassava, bananas, corn… now the land has been used to build those big houses…near my house there used to be trees, rambutan trees, banana trees, cassava, different types of trees, there were some folks who planted spinach, tomatoes and other vegetables. When we needed food, we just picked it. Now it’s so difficult…
As noted by Fajarini (2014), land for food production in Bogor has been paved over for urban development, which includes modern retail. However, little is documented about the impact of this trend has on food security and the impact of modern supermarket growth on food waste. Porpino, Parente and Wansink’s (2015) study on lower income-households in Brazil has challenged the assumption that food waste is only an issue in higher-income families. For example, they found that respondents buying groceries in bulk contribute to more household food waste (Porpino et al., 2015). In Brazil’s case, all respondents shopped at supermarkets (Porpino et al., 2015). For the low-income group in Bogor, the case is markedly different as they do not shop at supermarkets and instead shop at warung (small neighborhood food stores). Bulk shopping is unlikely as budgets are tight, and items are sold in small amounts (see Lee & Soma, 2016). It is common for low-income households in Indonesia to spend 70% of their income on food alone. As Hesti (a low income-respondent and domestic helper with a monthly salary of approximately USD $98 per month) noted, she could not afford to shop at a supermarket, only going there once per year. When asked about her food shopping she responded:

I buy daily at warung, sometimes with mobile vegetable vendors…sometimes there’s not even enough food

Most of the low-income Indonesians cannot afford to buy in bulk and are unable to store much food as many have small fridges, and in some cases, no fridge at all (see Lee and Soma, 2016 for fridge comparisons between income groups in Indonesia). Upper and middle-income Indonesians shop at supermarkets and face similar issues with respect to stocking up. Saskia (high-income) who shops at supermarkets often forgets her food:

I leave it too long so I forget. There is too much stuff in my fridge.

As confirmed in an interview with Bogor’s Head of Waste and Sanitation Department, food waste is a major problem:
For those from middle income, food waste is a fact that we recognize. For example, rice, it gets thrown out just like that... In the city of Bogor there is a lot of organic waste that enters the temporary dumpsite in our piloted 3R (reduce, reuse, recycle) site and a lot of it is food waste.

Compounding the food waste problem, supermarkets often implement stringent aesthetic standards for produce. By promoting strict aesthetic standards on farmers or curating the choices of products households buy, it is the supermarket that defines what food is ‘valuable’ for consumers. In fact, the issue of stringent aesthetic standards has been associated with food waste (Stuart, 2009) but is often conflated with food safety. This is exemplified by an interview response from one of the Directors at a hypermarket to a question on food safety:

… Well we have an SOP (Standard Operating Procedure). For example, the shrimp has to be a certain size. The chicken has to be a certain colour. The fruit has to conform to a certain grade and there is a certain standard of ripeness, a standard size…

Beyond curating the choice of food, the marketplace (e.g. supermarkets) has a strong role in shaping behaviour pertaining to household food consumption and food wasting. The marketplace actively obscures the geographic relations that bring objects into the marketplace (Coles and Hallet IV, 2013) and shapes the values around what can be categorized as “food”. For example, the grading process and demand for boneless skinless chicken breast in an Indonesian supermarket necessitates the production of chicken waste as other parts of the chicken are categorized as “waste” (e.g. skin, head etc). Therefore, a natural consequence of the ‘supermarketization’ in Indonesia is the spatial distancing between the farmer and the eater, as well as between the food (animals/produce) and eater.

This spatial distancing also results in mental distancing. For example, in the two ‘going-along’ (Kusenbach, 2003) trips with my respondents, I found meat carelessly discarded in the supermarket by other shoppers (see Figure 6) who later decided not to purchase it.
The example of consumers discarding food carelessly as demonstrated in Figure 2 is an example of the consequence of supermarket distancing. Clapp (2002) argues that due to distancing, there is diminished accountability and responsibility on the part of the consumers, retailers and producers. Unlike the wet market, warung or traditional mobile vegetable vendors where customers are usually known by the vendors and would banter back and forth about the food they plan to cook, in modern supermarkets, shoppers generally maintain anonymity. Therefore, the disconnect between the shopper, the staff of the supermarket and the producer of the food may result in the diminution of respect for the proper placement or treatment of food products once they are no longer wanted.

5.2 Food Waste Infrastructure, Urbanization and Distancing

By the mid-1990s, approximately, one-fourth of Indonesia’s urban population was concentrated in the Jabotabek (Jakarta, Bogor, Tangerang, Bekasi) area (Firman, 2002). Rapid urbanization in Indonesia serves to further disconnect urban populations from food production and the sustainable management of
food waste. With respect to food waste management, the practices of burying waste or composting in Indonesia have largely given way to the mixing of food waste with non-organic waste which is dumped in either temporary dumpsites or street corners. According to Saskia who lives in an exclusive neighbourhood:

I just dump it all in the garbage bin…there is no program to support the separation of food waste anyway, it’s sad

The lack of programs to support the separate management of food waste is echoed by other respondents and specifically by the neighbourhood waste collector. A key informant interview with Budi (pseudonym), revealed the challenges in developing a composting program:

In 2007, we tried to develop a composting process in the neighbourhood but it failed. The problem is that the technical experts from the city only visited the site twice…then when the compost was ready there were no strategies to utilize the finished product…the workers [waste workers] like me had to deal with mixed waste full of maggots and all kinds of waste…we only used plastic bags to cover our hands during sorting [referring to the lack of safety equipment].

With Indonesia becoming an urbanized country in less than two generations, the rapid increase of urbanization results in both environmental decline and trash accumulation (Dethier, 2017). Urbanization creates long distance distribution networks for waste and food (see Murray, Brock, and Seto, 2016) that span across continents and disengage residents from the food nutrient cycle. This also distances them from utilizing the nutrients from food waste and putting these nutrients back into food production. Budi noted that there were no strategies to use the finished compost, and as documented by Ayu’s experience, land for urban food production that could have utilized the compost had been paved over. A consequence of spatial displacement is a severance of the closed-loop food system that facilitates composting and the returning of nutrients from organic waste back into urban food production. Sustainable food waste management traditionally practiced in Bogor through practices such as burying or composting waste, as well as the feeding of livestock is becoming increasingly difficult due to urban development pressures.
Commenting on the scarcity of land in Bogor and the traditional practice of burying food waste, Joko (middle-income) stated:

…now it’s unlikely that there is enough yard space to bury your waste…

While only one upper-income respondent (Indah) still feeds food waste to animals, namely catfish (as will be noted later), city life makes it increasingly uncommon for residents to keep urban livestock. Livestock is useful as a food supplement for low income-respondents (four out of seven respondents had chickens) and makes it easier to manage food scraps. Atheera (upper-income) sends her leftovers with her domestic helper Rosi (pseudonym) to feed ducks:

I just give it [referring to leftover food] to Rosi, if she doesn’t eat it, she raises some ducks…ducks will eat anything, so nothing is wasted.

With regards to waste, under decentralization policy, the responsibility for waste management is task to regencies (Kabupaten) and cities (Kota) with limited central government involvement (Meidiana and Gamse, 2011). Despite waste law reforms in Indonesia by the central government such as Waste Law No. 18/2008 Articles 22 and 44, which requires the local governments to operate environmentally sound landfills, the laws are not necessarily implemented on a local level due to numerous issues such as insufficient financial resources (Meidiana and Gamse, 2011), mismanagement, inadequate machinery and unequal pickup coverage.

The infrastructural crisis as well as the lack of safety measures and protection is borne especially by low-income communities. As Budi noted:

There is no one to determine my pay. I offer my service to pick up waste and the cost I leave it up to the people. Some people pay me 10,000 Rupiah[per month] and I get a maximum of 50,000 Rupiah per month [per household] regardless of the amount of waste. I pick up garbage every day and never take a day off unless I am sick.

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8 October 2015 Exchange Rates from Bank of Canada 10,000 Rupiah range .68 to .75 US. 1 U.S. dollar = 14,000 Rupiah (approx.) http://www.bankofcanada.ca/
The struggle over urban space and land scarcity is aggravated by extreme income disparity. In Budi’s worksite, the community experienced interruptions when their temporary dumpsite was threatened by housing development (see Figure 7 below).

For Budi, the threat to the dumpsite is a threat to his entire livelihood:

I was worried, very worried. I don’t have any other experience. This is my only enterprise if I can call it that. It is my sole source of income…
As sites of consumption (Miles, 2010) it will be impossible for cities to maintain the scale of consumption in the long term. The collapsing waste infrastructures - as demonstrated by the landfill deaths and the precariousness of life for waste workers - illustrate the impossibility of maintaining modern levels of production and consumption without negative environmental and social impacts.

As Clapp (2002) argues, in highly distanced waste chains, accountability is diminished through loss of information. For example, Ayu is a low-income respondent who lives in a kampung adjacent to an upper-middle income neighborhood. She exemplifies the uneven burden of waste and the fact that regular waste collection service is connected to privilege. Ayu no longer pays into the informal waste collection service as she once had to wait three days for her garbage to be collected. Due to Indonesia’s humid climate, the food waste had started to rot. Ayu is the only respondent to admit dumping in the river (observations around the neighborhood show the river piled high with garbage) as it is illegal. Although Ayu said it is not ideal to throw waste in the river, walking to the temporary dumpsite every day is a hassle. She often waits until there is significant rainfall and then throws the garbage down the river in front of her house. As Ayu reports:

…that way, the bag will be taken by the flow and it will not pile up and cause flooding.

None of the middle and upper-income households interviewed burn their waste or dispose garbage in the river as they had reliable waste collection. Due to the heat in Indonesia, food waste deteriorates quickly. In low-income households the space is very tight, there are irregular pickups and many households do not have an income sufficient enough to pay for the pickup. As all of the respondents with the exception of one household (who compost) mix their food waste with general waste, the smell attracts animals. Several upper and middle-income households have resorted to spraying household insecticides on their garbage to kill ants and cockroaches. When this waste is dumped at the temporary dumpsite (TPS), waste pickers often take food in the waste pile not realizing that the food has been sprayed with insecticide. While some
respondents would like to separate their food waste from their non-organic waste, they perceive waste pickers to be a problem. As Puspa related:

…In this neighborhood [in Bogor] waste pickers are permitted to come. So, I mix my waste [food and non-food] because I know they’re going to sort through it anyway….

While urbanization has been identified as a driver of food waste (Parfitt et al., 2010), in Bogor, it also results in the loss of land to urban development and makes it difficult for urban residents to manage food waste sustainably.

5.3 The Role of Food Packaging Waste

Packaging waste goes hand-in-hand with large-scale, long-distance food supply chains. To provide consumer goods at a large-scale, goods are packaged to increase the ability to withstand long travel (Clapp, 2002). The prevalence of ‘modern’ food packaging has arguably catalyzed the Bogor waste crisis. Prior to modern retail and reliance on municipal waste infrastructure, the absence of municipal collection or composting was not an issue in Bogor as waste was primarily organic (food and yard waste) that was simply buried or composted. In developed countries, centralized large-scaled waste collection has only been available since 1950 (Strasser, 2000). In the case of Bogor, all of the respondents (except for one) no longer practice composting or the burying of waste. When I asked about the transformation in the type of household food waste and how it is managed, according to Joko:

There was not a lot of plastic waste before, so it was easy to manage the food waste, now there is too much plastic waste.

As Sarah (middle-income respondent), recounted:

Before, until the 1980s, you could pretty much dig and put the garbage in a hole…
Yes, dig a hole and you put the waste in…but what becomes problematic now is the packaging. Before, there was only a small amount of plastic and tin can waste.
The rapid transformation in the types of ‘modern’ food packaging waste (non-biodegradable) has not been accompanied by appropriate changes in the planning of waste management infrastructures. The Head of Waste Management for Bogor stated as follows:

There is a law UU No 18, 2008 that packaging waste is the responsibility of the producer. It is part of extended producer responsibility to pick up the packaging waste or to provide incentives to whomever can manage that waste…in the city of Bogor, those packaging wastes are residue. It cannot be processed in our temporary dumpsite and communal 3R sites…So, we try to encourage those packaging waste to become arts and crafts. We introduce this to the public in our training programs. Because it’s our job to educate, we inform the public that packaging waste if cut nicely can be arts and crafts that are saleable...

In practice, law UU No. 18 2008 on packaging waste is an empty law. According to the Head of Waste Management, there is a lack of compliance or monitoring of the producers’ responsibility despite the law. Furthermore, the focus selected by the municipal government to educate the public about the income generating potential of food packaging is not addressing the waste crisis caused by food packaging at the industry level. Responsibility for managing the waste is generally placed on the low-income respondents (who through their neighbourhood groups are recruited to attend these training programs). It is the low-income community who are expected to employ creativity and make a living from products made of food packaging (See Figure 8 of an arts and crafts product made from food packaging).

Figure 8: Purse made from coffee candy sachets. Photo: by Author
From the perspective of the low-income participants who have participated in such public programs, this ‘waste reduction’ or recycling initiative is not effective for reduction or income generation. Nurul, a low-income housewife who has participated in the craft training program said about the products:

It’s unlikely that someone would buy it unless they want something very unique. It’s not affordable for us as it is expensive…Once there was a gallery of the crafts and for a small wallet it’s 40,000 Rupiah made with packaging from the coffee sachets. I can buy a regular wallet from the wetmarket for 10,000 Rupiah.

While there are other ways in which recyclable food packaging can be a means for additional income for the poor, the amount of income generated is meager. Diah, a low-income respondent, stated that some food packaging such as plastic bottles can be collected and resold by her mother-in-law to a middleman for approximately 1000 Rupiah (less than one cent per kilogram). While the low-income communities assist waste reduction through informal recycling, this type of informal recycling measures cannot keep up with the amount of waste generated. A 2010 study in the City of Bandung estimate that informal recycling divert 13% of the city’s waste for recycling (Sembiring and Nitivattananon, 2010). For Saskia who is environmentally minded, there is a sense of futility in transforming food packaging waste for crafts, knowing that reusing it will lead to waste anyway:

… cereal packaging is big. I bring it to school with the hope that it will be used one day. I flatten the boxes and bring them to school and we make them into little boxes. But at the end they are wasted anyway…we try to recycle but we waste even more.

However, traditional Indonesian packaging differs. Indah, an upper-income retiree noted the superiority of traditional food packaging such as banana leaf and bamboo:

I like it better in the past when I used bongsang …Bongsang is bamboo that is weaved into a bag. When we used to shop at wetmarkets, the foods were wrapped in a banana leaf and then inserted in the bongsang.

Indah was the only respondent in the study to still practice composting. In her household, she grows her own foods through hydroponic and aquaponics (catfish operation), which has developed into a small
business employing a local low-income resident. Her family composts their food waste in the backyard, and feeds food scraps to the fish creating a closed loop system in her household. However, it is important to note that as an upper-income respondent, Indah has the privilege of having a large front yard and backyard, as well as the capital and resources to manage her aquaponic and hydroponic operation in her own house.

5.4 Conclusion

This chapter offers scholarly contributions to the field of planning by examining the impacts of urbanization on food consumption and food waste infrastructure through the framework of distancing. It concludes that rapid urbanization occurring in Indonesia is part of a spatial and mental distancing process that is transforming food consumption, the management of food waste and food packaging waste. The study has shown that patterns of food consumption in upper-income households are generally shifting toward the stocking up of food in refrigerators and the preference for shopping at modern supermarkets. These patterns lead to wasting and overconsumption. Conversely, low-income respondents are generally limited to daily shopping at traditional food retail. Through participant observation, it was observed that traditional food retail encourages interaction and relationship building between the vendors and the customers, which prevents the careless discarding of food as was found during participant observation at supermarkets. Supermarkets also shape the valuation of food through the conflation of food safety with stringent aesthetics standards. Consequently, for planners, it is important to consider urban development that will integrate consideration for the needs of traditional retail infrastructure such as mobile vegetable vendors, and support for community-based food production to increase food security.

For some of the low-income respondents, despair with the state of waste collection has resulted in them dumping their mixed waste in the river. With the growth of consumption and new types of non-biodegradable food packaging, these practices have resulted in issues such as flooding. Unequal access to
waste infrastructure has also burdened the poor by putting them in contact with dangerous substances such as fumes from burning plastic. For both upper and low-income respondents, plastic food packaging waste has become a barrier to more sustainable management of food waste as it makes composting waste more complicated. Respondents recognized that it has now become almost impossible to manage their own food waste onsite with the loss of space and excessive packaging. Unlike supermarkets where foods are generally branded and packaged, wetmarkets offer an opportunity for more sustainable food packaging practices and a return to reusable or biodegradable traditional packaging such as the banana leaf. The traditional practice of reusing *bongsang* can be encouraged through educational initiatives.

As demonstrated by the case study, urban land used for food production by low-income respondents has been paved to make way for urban development. Not only does this negatively impact food security for low-income residents, it also decreases space for the utilization of compost products. As noted by Budi, (the waste collector), despite efforts to compost, the lack of support from the municipality coupled with a lack of strategy to use the compost resulted in a failed initiative. City planners in partnership with the waste department can invest in training and infrastructures that support the marketing of compost products. This can be established by securing communal space to develop a neighborhood closed-loop food system. For example, regulations in development permits should require housing developers to set aside land for food gardens (urban agriculture) and neighborhood composting facilities in residential areas. Finally, it is unreasonable to put the ‘educational’ onus on low-income residents to creatively manage food packaging waste instead of implementing the already established laws on extended producer responsibility on producers to spurn more sustainable production. To conclude this chapter, the development of neighborhood closed loop food systems has the potential to counter the distancing process, bringing food near and sparking a more sustainable food system in Bogor, Indonesia.
Chapter 6

Space to Waste: The Influence of Income and Retail Choice on Household Food Waste in Indonesia

6.0 Introduction:

With mounting concerns over the need to feed nine billion people by 2050, climate variability, water sanitation and scarcity as well as energy shortage (O’Riordan and Sandford, 2015; Godfray et al., 2010), the paradox of food waste amidst hunger has become an important research agenda for various international institutions (Gustavsson et al., 2011; World Bank, 2014), policy makers (European Commission FUSIONS, 2016) and charitable foundations (Rockefeller Foundation, 2016). While many arguments call for an increase in food production to feed the growing global population (Gustavsson et al., 2011), it is estimated that current global food production is sufficient to feed 10 billion people (Holt-Gimenez et al., 2012) and yet approximately one billion of the global population experience food insecurity (Naylor, 2011). Some scholars are highly critical of the call for producing more food within a food system that leads to both food waste and food insecurity (Cloke, 2013). Others have demonstrated that the inequality of the organization of risks and uncertainty in food production results in wasted food (Gille, 2012). According to studies by Kummu et al (2012), a 50 percent reduction in global food loss/waste would ensure enough food for an additional one billion people.

The growing body of food waste literature covers an array of issues across the food supply chain, including at the agricultural stage (IMechE, 2013), processing (Møller et al., 2012), supplier and retail stage (Mena et al., 2011), as well as the consumer stage (Aschemann-Witzel, et al. 2015). Households have been identified as major contributors to food waste (Gooch and Felfel, 2014). It is estimated that this sector alone is responsible for eight times the energy waste of post-harvest losses due to the energy lost during food preparation and along the food supply chain (Ponis et al. 2017). In Canada, approximately
47% of the food waste generated occurs in the household (Gooch and Felfel, 2014). In the United States, households waste approximately 25% of the food and beverages they purchase (Bloom, 2011; Gunders, 2012). Reducing and preventing consumer food waste, specifically at the household level, is an important component of food waste studies that has given rise to multi-million-dollar awareness campaigns such as “Love Food Hate Waste” (WRAP, 2011). Studies on household food waste have focused on understanding the determinants of food waste (Graham-Rowe et al., 2014; Secondi et al., 2015, Evans, 2012), attitudes and behavioural studies (Parizeau et al., 2015), as well as technological interventions in households (Ganglbauer et al. 2013).

Despite a wide range of studies covering household food waste in the Global North, there is a dearth of studies exploring the issue of household food waste in the Global South with the exception of a few studies: an online survey with 150 households in Turkey using convenience sample (Yildirim et al. 2016), Turkish household food wastage estimate (Pekcan et al., 2005), household food waste cost estimates in South Africa (Nahman et al., 2012), and a qualitative study on the antecedent of household disposal in lower-middle income households in Brazil (Porpino et al., 2015). According to Parfitt et al. (2010), the primary reason for the lack of household food waste studies in the Global South is due to the practice of “Buy Today Eat Today,” which means that individuals purchase just enough to eat on a daily basis and therefore waste less. The primary assumption is that consumer food waste is predominantly a Global North problem while in the Global South the issue of food waste is concentrated at the agricultural stage (Gustavsson et al., 2011). However, Lee and Soma (2016) challenge this discourse by demonstrating the growing impacts of urbanization, the retail revolution, middle class growth and shifting consumption patterns upon food waste generation in the Global South.
6.1 Research Context

Indonesia’s middle-class was estimated at 150 million in 2014, which is a significant increase from 50 million in 2009 (Rangkuti and Wright, 2013). A growing number of Indonesia’s middle and upper-income consumers shop at modern supermarkets, facilitated by the supermarket retail revolution which was catalyzed by market liberalization and foreign direct investment (Reardon and Hopkins, 2006). As Supermarkets have not fully penetrated Indonesia, similar to the case of India, during the early stages of supermarket penetration their clients are predominantly upper and middle-class consumers (Minten, Reardon, and Sutradhar, 2010). However, in the Global South, supermarkets are no longer niche as the number of consumers shopping at supermarkets is growing. In 2005, 30% of Indonesians purchased their foods in supermarkets (Natawidjaja et al. 2006) while traditional retail such as wet markets have experienced a decline of 2% per year (Suryadarma et al. 2010). Increased urbanization has helped the growth of modern supermarkets as Indonesian are increasingly purchasing more frozen foods, packaged meals, and ready-made meals (Agriculture Agri-food Canada, 2012). However, traditional markets are still quite popular with anywhere between 70% to 80% of Indonesians shopping at traditional markets (Agriculture Agri-food Canada). At the advanced stages of supermarket penetration, on average, prices in modern supermarkets become lower than traditional retail for almost all of the types of food products examined (Ho, 2005; Minten, 2008). This trend toward price reduction will likely increase the number of low-income customers shopping at modern supermarkets.

Supermarkets in Indonesia promote “buy one get one free” marketing, stringent aesthetics standards, and bulk purchasing (Soma, Forthcoming). These marketing strategies are all documented to encourage more consumption and are linked to increased food waste (Stuart, 2009; Porpino et al, 2015).

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9 Wet markets: market selling fresh goods, vegetables, fruits and meats. Also called pasar basah in Indonesia
Accordingly, it is imperative to explore the impact of the supermarket retail revolution on food consumption and food wasting practices in Indonesia. Beyond retail transformation, other changes in Indonesia include the increase of modern refrigeration (Greenwood, Seshadri and Yorukogly, 2005) and dietary transition/convergence towards temperate, processed, and convenient food products (Pingali, 2007). Moreover, there is a push to increase consumption as the Asian Development Bank (ADB) asserts that in order to achieve economic progress, “the masses of Asia and the Pacific must increase their consumption” (Asian Development Bank, 2000, 19). As urbanization increases in Southeast Asia, Teng and Trethewie (2012) argue that urban dwellers will demand more variety, more food, and more wheat while food wastage will increase in major urban centres of Southeast Asia.

6.2 Literature Review

6.2.1 Food Waste and Income

There are a limited number of food waste studies focusing on the relationship between household income and food waste generation (Hebrok and Boks, 2017). These include Nahman et al’s (2012) and Ramukhwatho, Plessis and Oelofse’s (2016) study on household food waste in South Africa, Graham-Rowe et al’s (2014) study on household food waste in the U.K, Filipová et al (2017) consumer study in the Czech Republic, Porpino et al’s (2015) study on household food waste in Brazil, and Setti et al’s (2016) study on income and food waste behaviour of Italian consumers.

Filipová et al’s (2017) study in the Czech Republic found that individuals from higher income households waste more. On the other hand, Nahman et al (2012) found that there was a higher proportion of food waste in the waste stream of low-income households in comparison to high-income households. However, this is due to the fact that the design of Nahman’s et al’s study is based on the proportion of total aggregated waste, which included the sorting and categorizing of all the household waste both organic and inorganic. In the South African study, lower income households spent 37% of their income on food
while upper income households only spent 7% of their income on food (Aliber, 2009; Nahman et al., 2012). The findings from Nahman et al (2012) focus on proportion and differ from the approach taken by this study. In Brazil, Porrino et al (2015) found that lower-middle income households wasted food due to purchasing food in bulk quantities. However, it is important to note that Porrino’s study did not draw comparisons among income groups. Further, all of the respondents shopped at supermarkets and therefore the study could not provide information regarding different consumption and wasting patterns based on the influence of diverse retail types and income. A study by Setti et al (2016) found that in some cases, low-income households waste more than higher income households but only for certain types of food namely, foods that can be bought cheaper in large quantities (bulk), foods that are of low quality, as well as food from special offers.

A study in South Africa by Ramukhwatho et al (2016) surveying 210 households found that it was the high-income households that wasted the most food. The main reason for food wasting stated by respondents included over-preparation of porridge and rice (Ramukhwatho et al, 2016). Melbye et al (2016) found that there is no significant relationship between income and attitudes towards food waste in Norway. However, it is important to note that attitudes towards food waste do not necessarily determine the amount of food waste generated. For example, constrained financial circumstances requiring the purchase of cheaper and lower quality food can lead to food wastage even though a person feels that wasting food is bad. From a Global North perspective, Graham-Rowe et al’s (2014) study found that a decrease in disposable income caused households to be less frivolous and less wasteful with food. This analysis is supported by the most recent report by WRAP (The Waste and Resource Action Programme), which found that household food waste in the U.K. increased by 4.4 percent between 2012 to 2015 due to price deflation and increases in earnings (WRAP, 2017). Meanwhile, Wales is one of the country in the U.K. that met its food waste reduction target and has average weekly earnings that are 10% less than the
rest of the U.K. Results from Graham-Rowe et al (2014), Ramukhwatho et al (2016) and WRAP (2017) demonstrate that there is a positive correlation between an increase in income and an increase in the generation of household food waste, and more particularly, that reduced income prevents frivolity/wastefulness around food.

6.2.2 Retail Choice, Food Consumption and Food Waste

The impact of retail choices- specifically modern supermarkets- on food choices have been studied in various countries of the Global South (Asfaw, 2007; Neven, Reardon, Chege, and Wang, 2006; Minten, Reardon and Sutradhar, 2010; Battersby, 2017; Soma, 2017). However, there is a lack or absence of quantitative research investigating the intersection between retail choices and food waste with the exception of a study by Lee (2017) in South Korea (which is not a low-income developing country). Nevertheless, Lee’s (2017) findings on the influence of retail type and food waste are pertinent (2017). His study found that “wanting to take advantage of promotion” is a major driver of consumer over-purchasing and promotion-related marketing methods are specifically connected to the hypermarket retail model (Lee, 2017). In addition, the issue of “forgetting about the food” and then wasting it is also found to be associated with modern supermarkets and hypermarkets, specifically due to the influence of best-before date labelling (Lee, 2017). Best before date labelling is not an issue at traditional markets where foods are sold in whole and often without packaging (Lee, 2017). The study also confirmed that the “buy today eat today” practice, which is common in Indonesia, can reduce food waste. This is especially the case with the purchase of fresh fruits and vegetables (FFV). It is estimated that households who purchase FFV daily generate 69% less waste than those households who purchase FFV once a week (Lee 2017).

With regards to how certain types of retail infrastructure impact food consumption, in Guatemala, it was found that consumers who shopped at supermarkets tended to consume more processed food (Asfaw, 2007). In Kenya, consumers relied primarily on supermarkets for processed foods and shopped
for fresh produce at traditional vendors (Neven et al., 2006). In India, modern supermarkets were found to offer more labeled/branded food products, product diversity, and more packaged foods than traditional markets (Minten, Reardon and Sutradhar, 2010). Moreover, modern retail also offered cheaper prices for fresh produce in India (Minten, Reardon and Sutradhar, 2010) which in the case of Indonesia differs depending on the types of food. Food consumers in India who seek variety, are conscious about brands, and with limited time tend to shop at modern supermarkets (Jayasankara-Prasad and Aryasri, 2011). In China, consumers who seek freshness, and bargain are more likely to shop in more traditional retail formats such as wet markets (Maruyama et al., 2016).

In cities such as Shanghai and Guangzhou, China, almost half of the respondents in Maruyama et al’s (2016) study shop for fresh food in traditional markets. This is despite a privileging of the modern supermarket by the Chinese government (Maruyama, Wu and Huang, 2016). In 2002, the Chinese government implemented the “Wet Market Transforming into Food Supermarket” [WMTFS] program which aimed to modernize wet markets. However, there still exists a significant number of Chinese consumers that prefer traditional wet markets in comparison to modern supermarkets (Maruyama, Wu and Huang, 2016).

There is a marked difference in the characteristics of consumers who choose to shop at supermarkets. Several studies in the Global South have identified that those shopping at supermarkets will generally be wealthier, have access to a car, have more storage facilities, and practice one stop shopping (Goldman and Hino, 2005; Hu et al., 2004). It is critical to note that once a supermarket diffusion or penetration is complete (which is not yet the case in Indonesia), socioeconomic variables such as income will no longer matter and both rich or poor will shop at modern supermarkets (Goldman et al. 2002; Goldman and Hino, 2005). In South Africa, while the supermarkets are rapidly expanding and providing cheaper food, the unit sizes sold are generally too large to be affordable for the poor (Battersby, 2017).
Furthermore, traditional retailers can operate within a system of credit based on trust, thus making it possible for low-income members to purchase food in times of cash shortages (Battersby, 2017). As Gorton et al., (2011) noted, in Bangkok, Thailand, modern retail chains first focus on consumers with the largest purchasing power and then spread to small towns as the central markets become saturated. In Bangkok, supermarkets are often seen as having a higher standard of food safety. Within one decade, supermarkets have captured the majority of the market for non-perishable foods, beverages, as well as a significant amount of the fresh market in Thailand (Gorton et al., 2011)

The literatures reviewed demonstrate that food provisioning and food consumption practices are connected to among others, sociodemographics (income, class), and the type of retail infrastructure (or infrastructure in general). Kantor et al (1997) found that the majority of household food waste in the U.S comprised of expired foods that have been forgotten in storage (i.e refrigerators). As the availability of food storage facilities and the practice of stocking up is connected to overconsumption, it can be argued that the amount and type of food waste, which is part of the food provisioning process, may be impacted by retail type. Exposure to marketing ploys in supermarkets have also led to excessive purchasing, and the available processed foods is generally cheap, which further encourages bulk buying (Baumeister, 2002; Ene, 2008; Farr-Wharton et al., 2014). To better understand the connection between the built environment and food practices with a view to developing meaningful interventions, this study argues that practice theory offers a useful theoretical framework.

6.3 Theoretical Framework: Practice Theory

Dominant studies to develop models for behavioural change and to promote environmental sustainability have thus far been focused on behavioural theories. Behavioural theories, such as the Theory of Planned Behaviour (TPB) aim to identify causes of behaviour by examining beliefs, attitudes and intentions (Ajzen, 2011). Interventions have thus far focused on changing attitudes, which is
predicted to lead toward **behavioural** changes and **consequence** (ABC model). This model is premised on the idea that awareness and education will lead to changes in behaviour. In the case of food waste, the application of the theory of planned behaviour (Ajzen, 2011) and the theory of reasoned action (Fishbein and Ajzen, 1967) hypothesize that individuals make rational choices and once they are made aware of the negative impacts of food waste, they would rationally choose to reduce the amount of food waste that they produce. However, due to various internal (e.g. conflicting responsibilities) and external (cultural, economic) factors, even though people may have knowledge that wasting food causes deleterious environmental and economic impacts, they may not necessarily reduce their food waste. This gap between knowledge and action is called the “value-action gap.” The value-action gap is well documented as one of the main weaknesses of policy interventions that focus on promoting awareness with the expectation that individuals will change their behaviour after they are made aware of an issue. Another issue with the TPB model is that it does not consider the role of knowledge and skills/competency (Farr-Wharton et al., 2014). Another theory, value-belief-norm theory (Stern, 2000) focuses on understanding behaviours through moral and altruistic accounts. However, scholars such as Kaiser, Hubner and Bogner (2005) found that morality is already considered within the category of attitude (as used by TPB).

An extensive review of the food waste studies literature by Hebrok and Boks (2017) found that food waste practices are tangled in the complex routines of everyday life, and therefore cannot be easily influenced by education and best-practice information. As Stern (2000) and Farr-Wharton et al. (2014) argue, many behaviour change theories are insufficient in determining behavioural indicators. Wilson and Chatterton (2011, 2782) responded to the contradictions and the debate between practice theory proponents and behavioural theory proponents by arguing that multiple models' “are perfectly possible precisely because these multiple models represent different things, define different problems, and answer different questions.” In a nutshell, in the context of this study which is concerned with planning and
understanding food practices as it relates to food spaces, practice theory offers a useful model for analysis in comparison to TPB.

A study on U.K households by Evans (2014) demonstrates that household schedules and the complexity of domestic food provisioning practices are not readily changed by typical interventions commonly used by food waste campaigners and policy makers (e.g meal planning, portioning). He found that households are aware of the negative impacts of food waste and feel guilty about wasting. However, households are also negotiating a range of complex and contradicting anxieties such as anxiety around food safety, healthy eating, time scarcity as well as anxiety about wasting (Evans, 2014). With a growing awareness of the limitations of interventions based on theory of planned behaviour, an increasing number of researchers have started to apply practice theory in food waste studies (Evans, 2014; Lee and Soma, 2016).

This study integrates the theory of practice as it is useful for understanding consumption (Warde, 2005; Shove, 2010; Southerton, 2012) and the daily domestic practices of individuals in relation to their interactions with structured material things (infrastructure) and members of the society (Coleman, 2016). The theory takes into account that the behaviour of individuals is also shaped and influenced by their surroundings and social encounters (Reckwitz, 2002; Shove, 2010). Using practice theory, the focus moves from an analysis of the individual’s attitudes and choices, to an analysis on how practices are formed (Hargreaves, 2011). In chapter three, I have outlined how traditional food provisioning practices have been challenged with the rise of supermarket revolution. Furthermore, I have also illustrated in Chapter 4 on how the practices around gifting and sharing of leftovers (which is also an effort to reduce food waste) have been reproduced and maintained due to the unequal power dynamic. According to Shove and Pantzar (2005) the primary focus of practice theory is an analysis of three main categories that impact everyday practices: 1) material; 2) meaning, and 3) competence. To illustrate the application of practice
theory in the analysis of consumption, objects such as a stove may represent the material element; the perception of freshness represents meaning; and the knowledge of how to process food products represents competence. Altering the categories of material, meaning and competence, in turn alter the practice of food provisioning, and/or consumption, which in this case, could lead to new practices around food wasting and the management of food waste. Hand, Shove, and Southerton (2005, 680) argue that by examining the impact of technologies such as cooking devices, washing machines and dryers, scholars will discover how technologies (material infrastructure/ physical environment) become part of the “choreography of things and people in time and space”.

There is a lack of statistical data on household food waste and consumption patterns in Indonesia and a lack of quantitative studies on food waste employing practice theory (for exceptions see: Lee, 2017). However, in the case of sustainability studies, especially in the field of energy, it has been found that there is a correlation between household income and energy use (Hansen, 2016). For example, a statistical study by Hansen (2016) employing practice theory found that households with higher disposable income on average consume more heat (for a one percent increase in household income, heat consumption increased by 0.156%). By analyzing practices around energy consumption utilizing practice theory, Hansen (2016) noted that beyond socio-cultural characteristics, households with higher incomes also tend to live in larger buildings and by living in certain type of buildings practice certain energy consumption. Hansen’s (2016) study demonstrates that the type of building (which in practice theory is categorized into the “material” element) matters. In addition, supporting the impact of space and landscapes on practices, or in the case of Carolan’s (2017) study, “foodscape,” using practice theory, Carolan found that eaters (n=106) feel, think and behave differently after being exposed to different foodscape. The six spaces considered in his study included: Drop-off Community Supported Agriculture [CSA], Volunteer CSA, Farmers’ Market, Cooperative, Conventional Market (Carolan, 2017). It was found that certain spaces promote certain types
of practices and in some cases, such as the volunteer CSA, exposure to the foodscape promotes empathy between eaters of diverse economic backgrounds (Carolan, 2017). A study by Coleman of sustainable practices in a regenerative building using practice theory, found that buildings act as “agents” in reconfiguring people’s practices, and intervene in the inhabitants’ “ways of being” (2016, 229). Wu, DiGiacomo and Kingstone’s (2013) study using practice theory found that being in a building designed with sustainability (regenerative building) had a positive influence in encouraging pro-environmental behaviours related to food disposal. In the case of food waste, the type of food retail frequented by households of diverse incomes is particularly of interest in this study and it is worth considering the agentic role of diverse formats of retail infrastructure. Income also influences practice as it shapes meaning and the materials available for food provisioning. Another benefit of utilizing practice theory in quantitative food waste studies is to investigate the types of household practices based on a local socio-cultural context. This approach moves beyond a focus on individual’s rational behaviour to delve deeper into complex cultural and embodied practices.

6. 4 Respondents’ Profile

The sample in the study consisted of 323 households of which 93.8% of the respondents were female (see Table 1). This high percentage is understandable because the interviewers asked to speak to the person primarily responsible for food provisioning and preparation. Food provisioning in Indonesia is generally a gendered role. The age composition of the respondents was divided almost equally among four age groups ranging from 18-34 years up to 55 years and over. With respect to education, 20 % of the respondents possessed a university degree with the highest percentage consisting of participants with a high school education at 30%. In terms of employment, 64% of the respondents are homemakers and 51% of the households were families with children. With regards to income, participants selected a salary range which was then categorized by the researcher as either low, middle or upper-income.
<table>
<thead>
<tr>
<th>Item</th>
<th>Category</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>6.2</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>93.8</td>
</tr>
<tr>
<td>Age</td>
<td>18-34</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>35-44</td>
<td>23.6</td>
</tr>
<tr>
<td></td>
<td>45-54</td>
<td>26.9</td>
</tr>
<tr>
<td></td>
<td>55 and over</td>
<td>27.6</td>
</tr>
<tr>
<td>Education</td>
<td>None</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>Elementary</td>
<td>26.6</td>
</tr>
<tr>
<td></td>
<td>Middle School</td>
<td>13.6</td>
</tr>
<tr>
<td></td>
<td>High School</td>
<td>29.7</td>
</tr>
<tr>
<td></td>
<td>College Diploma</td>
<td>7.4</td>
</tr>
<tr>
<td></td>
<td>University</td>
<td>19.8</td>
</tr>
<tr>
<td>Number of household members)</td>
<td>1-2</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>3-4</td>
<td>45.5</td>
</tr>
<tr>
<td></td>
<td>&gt;5</td>
<td>43.3</td>
</tr>
<tr>
<td>Employment</td>
<td>Full-time</td>
<td>13.6</td>
</tr>
<tr>
<td></td>
<td>Part-time</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>Not Employed</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>Home Maker</td>
<td>63.5</td>
</tr>
<tr>
<td></td>
<td>Retired</td>
<td>6.8</td>
</tr>
<tr>
<td>Family Status</td>
<td>Single</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>Couple</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>Family with kids</td>
<td>51.1</td>
</tr>
<tr>
<td></td>
<td>Family all adults</td>
<td>42.1</td>
</tr>
<tr>
<td>Income</td>
<td>Upper-income</td>
<td>19.2</td>
</tr>
<tr>
<td></td>
<td>Middle-income</td>
<td>33.1</td>
</tr>
<tr>
<td></td>
<td>Lower-income</td>
<td>47.7</td>
</tr>
</tbody>
</table>

6.5 Food Shopping and Types of Retail: Material

The retail food provisioning infrastructure in Indonesia is categorized into modern and traditional...
Another type of food provisioning is “Rantang” (neighbourhood meal delivery) in the form of prepared foods that are pre-portioned and ready to consume. However, since only 22 respondents (6.8%) utilize this meal delivery service, this chapter will therefore focus on traditional and modern food retail and will exclude rantang (meal delivery). A quantitative study of consumer choice and the types of retail in India found that there is a statistically significant relationship between respondent demographics such as income and retail format choice (Prasad and Aryasri, 2009). More specifically, consumers who have higher incomes generally patronize modern supermarkets (Prasad and Aryasri, 2009). Similarly, survey results from this study found that 93.5% of the high-income respondents shop at supermarkets. In contrast, only 26% of low income respondents shop at supermarkets. The relationship between income and supermarket shopping was found to be statistically significant (see Table 2 below).

Table 2: Retail Format: Where do households shop based on income? (n=323). Households can select yes (y=1) or no (n=2).

<table>
<thead>
<tr>
<th>Retail Format</th>
<th>Income</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>X² &amp; p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low (n=154)</td>
<td>Middle (n=107)</td>
<td>High (n=62)</td>
<td>Combined (n=323)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetmarket</td>
<td>62 (40.3%)</td>
<td>63 (58.9%)</td>
<td>30 (48.4%)</td>
<td>155 (48.0%)</td>
<td></td>
<td>X² = 8.77, p &lt; 0.05</td>
</tr>
<tr>
<td>Supermarket</td>
<td>40 (26.0%)</td>
<td>75 (70.1%)</td>
<td>58 (93.5%)</td>
<td>173 (53.6%)</td>
<td></td>
<td>X² = 98.73, p&lt;0.000</td>
</tr>
<tr>
<td>Warung</td>
<td>140 (90.9%)</td>
<td>72 (67.2%)</td>
<td>24 (38.7%)</td>
<td>236 (73.1%)</td>
<td></td>
<td>X² = 63.91, p &lt; 0.001</td>
</tr>
<tr>
<td>Modern Mini Market</td>
<td>38 (1.8%)</td>
<td>58 (54.2%)</td>
<td>38 (61.3%)</td>
<td>134 (41.5%)</td>
<td></td>
<td>X²=35.07, p&lt;0.000</td>
</tr>
<tr>
<td>Mobile Vegetable Vendor</td>
<td>120 (77.9%)</td>
<td>86 (80.4%)</td>
<td>47 (75.8%)</td>
<td>253 (78.3%)</td>
<td></td>
<td>X²= 0.51, p = 0.77</td>
</tr>
</tbody>
</table>

The relationship between income and three (warungs, mini markets, wet markets) of the four other retail choices was also statistically significant. A much higher percentage of low income respondents
(90.9%) shop at warungs (small neighbourhood convenience stores) than high income respondents (38.7%) and a much higher percentage of high income respondents (61.3%) shop at modern mini markets than low income respondents (1.8%). Middle income households fell in between low and high income households for these two retail choices and for supermarkets. However, middle income respondents were the most frequent users (58.9%) of traditional wetmarkets, followed by upper income (48.4%) and lower income (40.3%) respondents. There was no statistically significant relationship between income and use of mobile vegetable vendors. A high percentage of respondents across the three income groups combined (78.3%) purchased food from mobile vendors. Overall, the most popular retail outlets were mobile vegetable vendors and warungs (used by 73.1% of respondents) followed by supermarkets (53.6%), wet markets (48.0%) and mini markets (41.5%).

The household interviews help to explain these patterns. Commenting on her use of supermarkets, Saskia, (an upper income respondent) argued that while prices at modern supermarkets can be more expensive, there are three key factors that influence her decision to shop at supermarkets instead of traditional markets: ease of access, time scarcity, food variety and cleanliness. Time scarcity is one of the major reasons why households stock up and shop less frequently. A consequence of stocking up is that there is more food in the fridge (which I have discussed in other chapters notably 3 and 5 as increasing food waste), and as Parfitt et al (2010) noted, urban demand for variety also increases food waste. Saskia’s circumstances are echoed by other upper-income respondents in this study:

For me, I don’t go to wetmarkets because they’re harder to access, I work so I can’t go in between office hours to the wet market…also the smell, you know when you go to the wetmarket it will definitely smell, there is salted fish displayed…when I pass, the smell is all encompassing. Basically Giant, Total, or other hypermarkets cater their businesses for people with long work hours like me …in the wetmarket, sometimes the vegetable vendors just put the vegetables on the ground, if I think about the whole process, I don’t even have an appetite anymore.

According to Rita (low-income respondent) who works as a domestic helper, shopping at the warung
comes down to the price:

I shop at *warung* because of the price…it’s cheaper…it’s even cheaper than the mobile vegetable vendor…

there are elite gated neighbourhoods in Bogor that prohibit mobile vegetable vendors from entering. The mobile vendors are seen as competition and as a “blight” to the modern façade of the exclusive neighbourhood. Suci (upper-income) who lives in a gated neighbourhood and participated in the first phase of the qualitative study confirmed the restriction as she has little access to mobile vegetable vendors:

It’s rare to find them in the “pristine enclave” [not real location] area actually….in the other part of the neighbourhood there was once a vendor who stayed and served the neighbourhood regularly, then the management said they cannot sell or do that activity…but then people complained…. 

While this ban restricts the upper-income respondents’ access to mobile vegetable vendors, in the quantitative phase of the survey, the area selected did not have a ban on mobile vendors as the upper income households were not located in elite gated areas.

The fact that middle-income and upper-income households still shop at wetmarkets or at mobile vendors in this study is not surprising especially due to the fact that domestic helpers are usually sent to go shopping on behalf of the employer as is the case with Nani (Chapter 4). However, the fact that shoppers regardless of income still shop in traditional markets does not address the issue of how much they shop there or the overall downward trend. As noted by Suryadarma (2005) the frequency of shopping in traditional markets, in Indonesia has been on the decline. This trend was confirmed by all three mobile vendors interviewed for this study. For example, as mobile vendor Asep noted in Chapter 3, since Giant* [*a multinational hypermarket and supermarket chain] arrived, his net income has been much smaller. Asep attributes this to the price difference as he is unable to compete with the supermarket’s predatory pricing (pricing wars). According to Yulia, a high-income respondent, while the supermarket is her main “go-to” shopping place, she sometimes purchases certain vegetables from the vendors that she feels are
fresher than the ones offered in the supermarket:

    I shop with the mobile vendors sometimes twice in a week…for example when I want certain
vegetables that are different from the supermarkets...for example, spinach and *kangkung* (water
spinach) are sometimes better and fresher from the mobile vendors…

### 6.5.1 Food Waste and Type of Retail: Material

The connection between the choice of retail outlet and the amount of food waste generated by a
household is also of interest to this study. Specifically, as noted in the literature review, in the study
conducted by Lee (2017), “store promotion” is a driver of overconsumption with this type of promotion
specifically tied to modern retail. Lee’s study (2017) also found that less frequent food purchases, which
are associated more with the practice of stocking up at modern supermarkets, result in increased food
waste. In the case of Indonesia, it is also important to note that those with higher income generally shop
at modern supermarkets as noted in section 6.5.

Survey respondents were asked whether they shop at supermarkets and were also asked to estimate
the overall amount of food waste they generate in their household (a lot, some, almost none, none at all).
To assess the association between the choice of food retail with food waste generated, a Chi Square Test
was conducted. An X² test found that there is a statistically significant relationship between shopping at
supermarkets and the estimated amount of food waste generated (p< 0.000) with those shopping in
supermarkets wasting a higher amount of food (See Table 3).
<table>
<thead>
<tr>
<th>Amount of Food Waste</th>
<th>Shops at Supermarket (Yes)</th>
<th>Shops at Supermarket (No)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Significant Amount</strong></td>
<td>Count 41</td>
<td>13</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Expected Count 28.9</td>
<td>25.1</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>% within food waste 75.9%</td>
<td>24.1%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Some</strong></td>
<td>Count 116</td>
<td>104</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td>Expected Count 117.8</td>
<td>102.2</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td>% within food waste 52.7%</td>
<td>47.3%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Almost None</strong></td>
<td>Count 15</td>
<td>27</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Expected Count 22.5</td>
<td>19.5</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>% within food waste 35.7%</td>
<td>64.3%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>None at all</strong></td>
<td>Count 1</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Expected Count 3.7</td>
<td>3.3</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>% within food waste 14.3%</td>
<td>85.7%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Count 173</td>
<td>150</td>
<td>323</td>
</tr>
<tr>
<td></td>
<td>Expected Count 173</td>
<td>150</td>
<td>323</td>
</tr>
<tr>
<td></td>
<td>% within food waste 53.6%</td>
<td>46.4%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Figure 9: Choice of Retail Type and Amount of Food Waste

6.6 Food Shopping Patterns and Food Waste Management: Material and Competence

6.6.1 Food Shopping and Food Storage Practices

Various studies on food waste reduction and prevention recommend that households stick to a shopping list in order to prevent over purchasing (Parizeau et al. 2015; Porpino et al. 2015; Yildirim et al. 2016). The preparation of shopping list, meal planning, and proper storage practices are seen as acts of competency and food literacy that can prevent the wasting of food. However, these recommendations are premised on a food consumption pattern that is based on a supermarket model. These recommendations also assume a particular type of retail experience. In the case of Indonesia, mobile vegetable vendors arrive directly in front of the household and sell a small amount of seasonal food which is just enough for the household to consume for the day. At the warung, availability of certain products is not guaranteed, and participants might have to change their menu plan based on what is available at the vendor or often wait.
until they see the produce offering to decide what to make. As mobile vendors circulate throughout the neighborhood on a daily basis (seven days per week) homeowners do not need to bring a list. Therefore, not making a list does not necessarily preclude competence/food literacy and savviness. Similarly, lower income households who shop at warungs have a smaller budget. Due to their strict budget (and the fact that warungs only accept cash) they can only purchase in small amounts. Warungs, wetmarkets and mobile vendors offer seasonal products and therefore availability of products fluctuate and customers have to be prepared to cook whatever is available. When I asked Hesti (low-income) if she brings a grocery list, her response was telling:

I don’t bring a list…I decide what to cook when I arrive at the warung

For warungs and mobile vendors, the variety of the products are limited and nowhere near the variety of supermarkets. By mid-day or early afternoon, both warungs and mobile vendors will stop selling fresh produce as they will either run out and it is expected that customers will already have their food for the day cooked. With the exception of dry goods in warungs such as instant noodles, and rice, these retailers in general do not use refrigeration and rely on daily purchasing patterns by the households.

A shopping list is therefore useful when consumers can expect or assume that a particular type of product will be available. Puspa (upper-income) who shops at both supermarkets and supplements with mobile vegetable vendors told me that she needs a list when going to the supermarket:

I don’t bring a handwritten shopping list, I have it on my cellphone, my kids would text me what they want. I have regular items that I remember, the rest I write out on my cellphone.

However, Puspa is unusual in her reliance on a list since only 10.5% of respondents actually make a list. In contrast, 80% of consumers from Trinidad and Tobago claim that they made a shopping list prior to grocery shopping (Sims and Narine, 1994). Most respondents in this study (67.5%) purchase food spontaneously as they often have to adjust and/or tailor the menu based on what’s available. Note that this is different from simply impulse buying. According to several studies in the Global north, spontaneous
purchasing (purchasing without a list) often generates more food waste (WRAP, 2011). This does not necessarily apply in certain circumstances in Bogor. For example, when respondents purchase food in retail infrastructures that only accept cash, it is harder to go over budget. Moreover, when consumers have a limited daily shopping budget, when there are limited product options, and where products fluctuate depending on the season, it would make it difficult to create a list. Patterns of food shopping are related to competence as daily shopping practices versus stocking up practices require diverse competencies in the management of food, the cooking of food as well as other associated practices around the storage of food.

A chi square test found that there is a statistically significant relationship between income and patterns of shopping for main foodstuffs. In Indonesia, “main foodstuffs” are called SEMBAKO (Sembilan Bahan Pokok- 9 main foodstuffs). The SEMBAKO consists of: 1) rice, sago and or corn; 2) sugar; 3) vegetables and fruits; 4) meat; 5) food oil; 6) milk (note that milk products in Indonesia are often in the form of powder or UHT shelf stable milk; 7) eggs; 8) cooking oil for the stove; 9) salt. A higher percentage of lower-income households (57.8%) shop daily to buy only enough food for the day compared to middle (12.1%) and high (4.8%) income households ($X^2=101.710, p<0.000$). A high percentage of high-income (40.3%) and middle-income (52.3%) households shop less frequently (once a month) for main foodstuffs. Yoo et al (2006) found that less frequent shopping in the case of Houston, Texas suggests larger amounts of food purchased. According to Yulia (upper-income), she usually needs extra shopping after her weekly main shop:

Even though I shop once a week, I still sometimes shop mid-week to add up…

On the other hand, when I asked Rita how many times she would shop in a week, she responded:

Oohh I shop every day…yes at the warung
Yulia’s pattern is a marked difference from the example of Hesti (who never brings a list because she shops daily and plans her menu spontaneously based on what is available) and Rita. Figure 10 provides an overview of the frequency of grocery shopping. Note that the respondents were asked what “best represents” their patterns of grocery shopping, specifically with regards to the purchase of main food stuffs (i.e SEMBAKO). While a respondent may choose an answer stating that they in general do shopping for main foodstuffs once a month, this does not entail that they do not do additional shopping.

![Figure 10: Frequency of grocery shopping](image)

As noted in Chapter 2, household food storage infrastructure in the form of refrigerators can play an important role in food wasting. Income was found to have a statistically significant relationship with
refrigerator ownership. Over 22% of low-income households in the study do not own a refrigerator, whereas all middle and high-income households have refrigerators, with 40.3% of high income households and 23.4% of middle-income households having two. The size and number of refrigerators (material) can facilitate stocking up and can alter household practices (specifically competencies) related to food storage. With a larger refrigerator, households can store more food, often disregarding food at the back of the refrigerator, all of which potentially results in more food waste. Icha (middle-income) states that she would often forget food in the fridge:

I forget food in the fridge at least once a week and it gets spoiled…for example bread lasts only three days, so if we don’t get to eat it, it goes to waste…also foods that spoil quickly like fruits and vegetables…if I forget to serve it, it [the food] just stays in the fridge so the other people in the house won’t just take the initiative to get it by themselves. I sometimes forget to serve and so it’s uneaten.

6.6.2 Competency in the Management of Food Waste

The study was not only interested in the ways in which food waste was generated, it also tackled the issue the material aspects of waste infrastructure and competence in food waste management. Firstly, the issue of food waste is also connected with the ease in which food waste can be prevented, reduced and or diverted from landfills. There are immense challenges faced by municipalities and communities with respect to the management of solid waste in the Global South. It is estimated that over 25% to 50% of the waste generated in municipalities in developing countries is uncollected (Pasang, Moore & Sitorus, 2011, Parizeau, Maclaren & Chanthy, 2006). The problem of inadequate waste collection is not only found in poor and marginalized communities. Even in urban centres and high-income neighbourhoods, collection services can be irregular and the waste collected is often not disposed through sanitary means (Kironde & Yhdego, 1997; Pasang et al., 2011).

With respect to how food waste is managed, 51.4% of respondents stated that they give food waste to animals, which can consist of pets or urban livestocks. In the food recovery hierarchy framework,
feeding food waste to animals is categorized as the third level of priority under feeding people (Papargyropoulou et al. 2014) and is viewed as superior to composting. Composting is commonly regarded as an ideal solution to address organic waste as it is a relatively low-cost approach to manage household food waste. Composting turns organic waste into an agricultural resource and it is a vital component of an integrated sustainable waste management program and sustainable agriculture. In fact, composting has been promoted as one of the most feasible tools to address the management of organic waste since it reduces the organic waste that would otherwise go in landfills (Hoornweg et al., 2000).

With respect to the knowledge of how to compost, 26.6% of low-income respondents, 43.0% of middle-income respondents and 59.7% of high-income respondents stated that they know how to compost food waste. However, 92.6% of the respondents stated that they never compost their food waste. The discrepancy between the knowledge of composting and implementing the practice of composting is also based on the ability to access yard space (backyard etc). There was a statistically significant association between income and the availability of composting space \( (X^2 = 47.82, p > 0.000) \). Of respondents, 46.6% of high income respondents and 41.4% of middle income respondents stated that they had space to compost their food waste. Meanwhile only 12.1% of low-income respondents stated that they had space to compost. Therefore, recommendations on better food waste management which has hereto simply focused on education and awareness of composting are insufficient. To facilitate composting, there needs to be additional considerations about space and an awareness by policy makers of the inequality of access to space.

From a material infrastructure and competence perspective, it is important to understand the context of food waste management in Indonesia and what services are currently available for the population. In the Bogor sample, only 14.2% of the respondents had direct waste collection from the municipality. The majority of the respondents (40.2%) hire the service of an informal collector, with some
neighbourhoods serviced by private haulers (16.4%). It is important to note that access to waste collection/pick up is not evenly distributed in Bogor. A sizeable number of the respondents (24.8%) did not have any waste collection service at all. In terms of waste collection fees, 48.7% of low-income household, 78.5% of middle-income households, and 93.5% of high-income household pay for waste collection. Therefore, the sustainable management of food waste cannot rely on assumptions around the “ability” to segregate food waste (organic waste) from other waste. This is due to the fact that the infrastructure of food waste management is highly uneven and an ability to segregate food waste does not entail that said food waste is diverted from the landfills by the collectors/municipal pick up.

6.7 Food Beliefs and Meaning: Managing Surplus and Leftovers

In Indonesia, there are cultural and spiritual factors that influence respondents’ values and behaviours on food wasting (Soma, 2016). These sociocultural factors are important factors to consider in the application of practice theory and can be categorized as meaning (Shove and Pantzar, 2005). In the survey, 80.2% of the respondents agree with the statement that “people will think poorly of me if I waste food.” Of respondents, 83.3% agreed with the statement that their “faith prohibits them from wasting food” and 83.6% agreed that “their culture prohibits wasting food.” Respondents of the Islamic faith would sometimes quote the verses of the Holy Quran on prohibition against wasting (Soma, 2016). As noted in Chapter 2, some would also fondly recall a common advice from elders, “eat all the rice or the rice will cry”. This *pepatah* (saying/advice) comes from the “Tale of the Crying Rice,” a Javanese folktale that is often used to teach kids not to waste as wasting rice is seen as wasting the labour of the farmers, the land and the resources (Soma, 2016). However, the cultural norms that frown on wastefulness may not necessarily entail that respondents do not waste food, and is reflective of the gap between values and practices. Practice theory can address the complexity of said practices by integrating consideration of competency and material factors. The complexity of food practices which includes anxiety about health,
best before date, food safety, the tendency to stock up and the need to eat new fresh food everyday by some members of the upper-income class can indeed lead to food wasting.

In the case of Indonesia, the performance of food gifting and the sharing of surplus/leftover food helps us understand how spiritual meanings connected to food influence households’ efforts to reduce food waste. The giving of leftovers is quite common especially from upper income households to lower income households and specifically between employers and domestic helpers (Soma, 2017). The survey found that when the respondents were asked what they do when they have leftover or surplus food, 56.7% responded that they give it to someone else. A chi-square test for association was conducted between the practice of gifting leftover foods to others and income. All expected cell frequencies were greater than five. There was a statistically significant association between income and the preference for the gifting of leftover foods $X^2(2) = 25.49$, $p< 0.000$ with (77.4%) of higher-income respondents stating that they give leftover foods to others while only 42.9% of low-income respondents stating that they share or gift leftover foods to others. Yulia (upper-income) gives away surplus food almost every day:

When we eat in the afternoon, if there are leftovers in the morning we immediately give them to the waste collector. The food is still relatively good because we give it in the morning after, so it can be eaten for his lunch.

In Indonesia, it is very common for upper and middle-income households to rely on domestic helpers for the general maintenance of the home, for caregiving, cooking and for shopping. Figure 2 provides a graph of the number of domestic helpers employed based on income:
Some domestic helpers live with the homeowners (live-in) while others go home at the end of the day (live out). To better understand the dynamics of household provisioning and food consumption in Indonesia, it is important to understand the role of domestic helpers. While in some cases it is helpful for the low-income households to receive surplus food from upper-income households to increase diet variety, it does not solve the issue of food insecurity and, in some cases, the domestic helpers are relied upon to absorb the food waste and overconsumption of the rich (Soma, 2017). For example, some upper income homeowners refuse to eat leftovers because they consider reheated food to be unhealthy. However, they do not see this as an issue when giving their leftover food to the poor (Soma, 2017). Therefore, in terms of the management of surplus or leftover food, the fact that 56.7% of the respondents stated that they share the food with others can undoubtedly reduce food waste. However, when the domestic helpers or the low-income population are constantly expected to absorb the food waste of the upper and middle-income, there
are issues with regards to a lack of choice, dignity and the fact that the upper income households do not have to adjust their patterns of over consumption.

Among other approaches to address surplus food and leftovers, 73.4% of the respondents stated that within the week preceding the survey, they transform food into something new (a common response was that extra rice would be made into fried rice). In the survey, 48.3% of the respondents stated that they also re-serve leftover foods during the week. Unlike North America, where breakfast food is distinguished from lunch or dinner food, many Indonesian households do not differentiate between breakfast, lunch and dinner food. Therefore, leftovers can easily be served and reheated for breakfast, lunch or dinner and consumed with rice. For low-income households like Rita’s that can only afford to consume two meals, they usually eat similar food for breakfast and lunch:

Breakfast is pretty much the same…fried tempeh or if not with eggs…

In addition, a high percentage of the respondents (67.8%) stated that they feed animals with leftover or surplus food.

Figure 12: Feeding food waste to animals in Bogor. Photo: by Author
Diah (low-income) is a laundry washer. When I asked her how she dealt with extra food, she pointed to her chicken that she keeps in her one-bedroom home:

Sometimes I have some extra food, but I have a chicken so instead of being wasteful [mubazir] I give the food to the animal.

6.8 Amount of Food Wasted by Income

When respondents were asked to estimate how much food they wasted in total, 32.3% of high-income households responded that they waste “a lot” whereas only 9.1% of low-income households stated that they waste a lot. On the other hand, none of the high-income household stated that they had no waste. The relationship between income and perceived food wastage was found to be statistically significant ($X^2 = 27.30, p > 0.001$). Figure 13 provides an estimate of the amount of food wasted based on income.

![Figure 13: Estimated Amount of Food Waste by Income Group](image)

To further test the relationship between income and food wastage, respondents were also asked the amount of food they wasted based on six targeted food categories. As quantitative data from the municipality was
limited, and the overall estimate of food waste amount provided a broad overview, a waste index was
further developed based on estimates (tallied in points) of the amount of food that the respondents wasted
in one week. The waste index provides an estimate of the amount of food wasted by the following food
category: 1) Fruits, 2) Vegetables, 3) Baked goods: Bread and Cookies, 4) Rice, 5) Protein/ Meat, and 6)
Beverage: Milk and Juice. A one-way ANOVA was conducted to determine if the waste generation index
for six food groups (see food waste index outlined in Chapter 2) was different for groups with different
income. Due to violation of homogeneity of variances, a Welch test was conducted. The test revealed that
generation of food waste (food waste index) was statistically significantly different for different income
groups, Welch’s $F (2, 141.503) = 23.199$, $p < 0.001$. A Games- Howell post hoc test revealed that there
were statistically significant differences in the food waste index between the low income group (FWI=8.5)
and the middle income group (FWI=10.9) and between the low income group and the high income group
(FWI=12.0) ($p<0.001$). However, there was no statistically significant difference between the food waste
index of the middle and high-income groups ($p=0.15$).

6.9 Discussion and Conclusions:

To conclude, the findings reveal the importance recognized by practice theory (Shove and Pantzar,
2005) of better understanding the intersection between material infrastructure, meaning and competence
in shaping the complex everyday practices associated with food waste generation in Indonesia.
Specifically, the fact that this study’s main contribution reveals that food provisioning and food wasting
practices vary by income. This chapter demonstrates how practice theory can be applied in a quantitative
study on household food consumption and food waste generation. Furthermore, the chapter demonstrates
that spatial factors such as the type of food retail infrastructure influence household food consumption and
food waste generation in Indonesia by promoting or enabling certain types of consumption practices such
as stocking up. This finding is also supported by a study employing practice theory, on the agentic impact of sustainable buildings on people’s practices (Coleman, 2016). This chapter concludes that there is an agentic impact to particular retail models. Often, studies on food waste have focused on changing consumer behavior, attitudes and awareness (Quested et al., 2013) providing recommendations on improving waste infrastructure by enabling the public to source separate with ease (Ghani et al. 2013) or recommending improvement on composting bins to encourage more people to compost (Metcalfe et al., 2013). However, recommendations on food waste reduction rarely address spatial considerations, and more specifically, the need to develop material food waste infrastructure and planning considerations that can promote a more sustainable food system (with the exception of Evans-Cowley and Arroyo-Rodriguez, 2012; and Lee, 2017).

6.9.1 Food Waste and Retail

In Porpino et al’s (2015) study of lower-middle income households in Brazil, the authors found that there is a propensity to over-purchase. However, what distinguishes Porpino et al’s (2015) study from this study is that all of the Brazilian households in his study shopped at supermarkets (Porpino et al, 2015). Meanwhile the respondents in Bogor still have access to traditional retail. Supermarket expansion is growing in Indonesia and it is slowly becoming more accessible to the lower middle-income population due to highly competitive pricing strategies. The normalization of consumption practices, such as shopping at supermarkets, influences other practices, such as enabling access to more processed and convenient foods, and storing foods in refrigerators rather than “buy today eat today.” In a study conducted on Turkish households, it was found that 51% of respondents were attracted to the special offers marketed by both supermarkets and hypermarkets (Yildirim et al. 2016). These offers increase consumption and have been identified as a source of food waste (Stuart, 2009). Special offers do not officially exist with traditional retailers such as mobile vendors, warungs or wetmarkets. However, it is possible to bargain or
negotiate the prices depending on the relationship between the vendors and the customers.

The continued corporatization of the food system in the global South (McMichael, 2009) will impact the ways in which consumers shop, their food preferences, the amount they purchase, the pricing of food, and the waste generated. The transformation of food provisioning practices is connected to food wasting practices. Urban food studies in the global North have also addressed issues such as urban food deserts (Wrigley et al, 2002; Larsen and Gilliland, 2009), by recommending more access to food retail infrastructure. However, what this study has uncovered is that there currently exists in urban areas of Indonesia various traditional food provisioning infrastructures that enable consumers to continue a “buy today eat today” practices, that promotes seasonality (food depending on seasons), that is mobile and accessible (mobile vegetable vendors), and that can reduce overconsumption. With the modern retail revolution in various areas of the global South, and the decline of sales in traditional infrastructure, it is possible that the trend will result in an erasure of traditional food infrastructure. The decline in traditional food infrastructure will impact low-income households the hardest as they are reliant on traditional food retails due to accessibility, affordability, and the ways in which this infrastructure supports a buy today eat today practice.

6.9.2 Sustainable Food Waste Management

Considering the gap between food consumption and the infrastructure available to process food waste in Indonesia, composting has the potential to provide numerous benefits including but not limited to: serving as a natural soil amendment for agriculture, creating employment opportunities, generating additional income for municipalities/communities that run composting programs, diverting waste from landfills and providing a relatively inexpensive process to manage organic waste (Hoornweg et al., 2000; Nunan, 2000). While not all respondents know how to compost, a significant number do have the knowledge. However, regardless of knowledge, the ability to compost needs to be paired with access to
land. Access to land will not only support better management of food waste, it will also improve the ability of respondents to grow their own food as discussed in Chapter 5.

6.9.3 Food Waste and Culture

Other factors that influence practices of food provisioning and the management of surplus/ leftover food in Indonesia also include culture and religion. As observed, a significant majority of the respondents stated that their culture and religion prohibit them from wasting. Therefore, respondents may try to divert food from being wasted by feeding to animals, sharing with people or transforming the food. However, as recognized by practice theory, socio-cultural context and practices are also influenced by other factors such as built environment, work practices and competence. Therefore, values associated with religion may not necessarily mean that people are not wasting their food. Over half of the respondents surveyed (56.7%) stated that they share/ give away leftovers and surplus food to other people to prevent food waste. While the household survey did not ask who they shared their foods with, qualitative findings from the study found that leftover unwanted foods are most often given from upper or middle-income households to lower-income households. A common pattern is for employer to give food to domestic helpers, or in the case of Yulia (as mentioned previously), she often shares leftover foods with the waste collector. The qualitative study demonstrates that foods are often gifted from upper-income households to lower-income households. While sharing food or feeding the poor can be helpful, it is important to consider the unequal social relations and interclass dynamics that exist between employees and domestic helpers.

Indonesians in the study consider it common to share food. However, ensuring space for food growing, better wages, and composting would allow for more self-sufficiency, choice and dignity for low-income households, and better food waste management for the surrounding neighbourhoods. The cultural patterns of “buy today eat today” have been disrupted by long-commutes and longer work hours. Mobile vegetable vendors and wetmarkets support buy today eat today practices and reduce the need to stock up.
However, as noted by the upper-income respondents, wetmarkets are not as convenient as supermarkets for busy people. More research on wetmarket revitalization is needed that would enable wetmarkets and traditional vendors to adapt to the changing needs of the demographics. Further studies on urban food waste should pay particular attention to the spatial determinants of food waste and the material infrastructures of food provisioning. This research has demonstrated that efforts to prevent food waste will need to move beyond raising awareness and will need to include planning and infrastructural considerations.
Chapter 7

Conclusion:

“Waste” is the political other of capitalist “value”, repeated with difference as part of capital’s spatial histories of surplus accumulation.

(Gidwani and Reddy, 2011, 1625)

7.0 Dissertation Overview

In a recent special issue on “Planning for Equitable Urban and Regional Food Systems” published in the journal Built Environment, editors Raja, Morgan and Hall (2017) posed the following critical question: How does the field of food systems planning tackle issues such as equity, inclusion, and justice? Most importantly, in the process of planning for a more sustainable food system, planners should ask whose voices are being engaged and amplified? Who are the ones framing the problem? And who are the ones designing the solutions? It is specifically these concerns on inclusion, equity and justice that have driven me to challenge the dominant framing and the dominant response to the “food waste problem” in Indonesia. Throughout this dissertation, I have taken great care to amplify the voices of community members that have thus far been “expected” by policy makers, employers and generally people of the upper class, to absorb, and or creatively manage some of the “waste” or surplus matters of others. The phenomenon of food waste and the challenges of food waste infrastructure explored in this thesis illustrates the consequences of a neoliberal agenda premised on modernization, deregulation and its quest to identify Indonesia as an emerging urban frontier of consumption based on the Western model. For example, former President Soeharto’s neoliberal “New Order” exemplifies an agenda of government decentralization and foreign market liberalization in Indonesia. However, it is important to conclude this thesis without leaving neat and rigid binaries between modern and traditional practices.

When Giddens (2013) provided a simplified definition of modernity, he referred to modernity as modes of organization and social life that emerged in Europe around the 17th century onwards which
became influential globally. While I use the concept of modernity to describe certain phenomena that were spread via Western ideas and market liberalization, it is important to note that modernity is not monolithic nor is it static. In analyzing food practices in Indonesia, I would like to carefully note that food practices such as purchasing from traditional vendors and eating traditional foods do not then preclude an individual from being “modern.” It is possible for food practices and infrastructures (commonly viewed as “traditional”) that are prevalent in the Global South, to be adopted at a later stage in the Global North. Examples of street food culture and the emergence of food trucks in the North as documented by Agyeman (2017) are similar to a common practice in Indonesia widely known as pedagang kaki lima (literal translation: “five-legged vendor”\(^{10}\)). Mobile food delivery through online shopping exemplified by Amazon Fresh, and Grocery Gateway have only been recently adopted in the North American context (Morganosky and Cude, 2000), while in Indonesia, mobile food delivery has been around for decades through tukang sayur. It seems that in some cases, the Global North is actually just now catching up to “traditional” practices of the Global South.

When I refer to modern development, I speak notably about particular models of urban development based on developer-led shopping mall retail expansion that enabled the supermarket revolution in Indonesia and in many other countries (for a similar example in South Africa see: Battersby, 2017). From a spatial perspective, the modernization process in Indonesia has also included an urban development agenda that has resulted in the eviction and the displacement of communities that do not reflect modernity (e.g. the displacement of kampung or urban slum dwellers to make room for exclusive urban renewal projects) (Firman, 2004), a prioritization on exclusive gated housing (Leichenko & Solecki, 2005) and modern retail development (Kenichiro, 2001). I also refer to the role of market liberalization and foreign direct investment accompanied by structural adjustment policies that eliminated agricultural

\(^{10}\) Pedagang kaki lima: five-legged vendor because it is common for the vendors to sell food using wooden carts with three wheels. When you add their two legs, there are five moving parts. Hence the five “legs.”
support for local farmers, land dispossession (as noted in Chapter 5) and a growing focus on a global export-oriented market which reduced overall local subsistence (Collins, 2007).

In this thesis, I have argued that processes such as rapid urbanization and the supermarket revolution have had a significant influence in transforming the food system and food consumption in Indonesia, resulting in the intensification of industrial agriculture, growth of multinational foreign retailers (supermarket revolution), overconsumption, and diet transition towards more processed, and temperate foods from a global food supply chain. In rapidly urbanizing cities, such as Bogor, the growth of elite enclaves and malls on the one hand, and a waste crisis on the other hand, perfectly illustrates Roy’s (2011) categorization of the processes of urbanism as circuits of capitalism and consumption. In essence, this dissertation has demonstrated how the City of Bogor has become an important arena in the unequal urban struggle to access food, land, and public services associated with waste infrastructure in the Global South. It has uncovered the diverse ways in which households of various income manage food waste, the role that culture, as well as the built environment (material infrastructure) influence food consumption and food wasting practices.

Returning to my insider-outsider positionality, I reflect on the role of gender and food provisioning in the context of my thesis. Food provisioning, cooking, food preparation, food literacy, and food shopping, in many cases were claimed in the qualitative study by most of the female respondents (with the exception of one male respondent) as their strength. While the division of labour was recognized by many of the women, it was not seen as a type of labour that is of less value than the labour of their male counterparts. Thus, while domestic work might differ, it is not seen as unequal to work outside of the home. In fact, some of the women also noted the Islamic oral tradition that “paradise lies underneath the feet of mothers” to demonstrate the importance of their role and their sense of empowerment. Many of the female respondents felt a sense of pride in the food that they make, stating that the taste of restaurant food
cannot compare to the authenticity of their home cooked foods and that their food is more healthful. To reclaim and acknowledge the value, agency, skills, labour, and power that women hold in their effort to nourish their families are ways to challenge the oft-repeated stigma and belittling that is common around domestic work (Mendez, 1998), food service work (Wildes, 2005) and food provisioning work. Therefore, it is critical to acknowledge that the choice to work predominantly within the domestic sphere should not preclude an individual from being seen as “modern.”

The struggle for food and for land (space to grow and space to manage food waste) in Indonesia is reflected in the tension between modern food retail and traditional retail, the disproportionate burden of food waste and its associated packaging on marginalized community members (especially low-income households, and informal waste collectors), the tension between traditional vendors and modern supermarkets, as well as the power dynamic between upper and middle-income households and domestic helpers in practices around food gifting and ridding. This dissertation has expanded the food waste narrative by investigating the social relationships and the material infrastructures behind the process of food wasting as well as an analysis of household food waste and food consumption by respondents of different incomes. Following Gidwani and Reddy’s (2011) categorization of “waste” as the political other of capitalist “value”, this dissertation has also demonstrated how lower-income households, waste collectors (informal waste pickers), and especially domestic helpers, have in some cases been expected to subsume the role of capital’s “political other” or what I have termed “people as waste infrastructure” by absorbing, reusing and repurposing the unwanted surplus from the accumulation (value) of others.

Eleven years after the Leuwigajah tragedy (21st February 2005), a tragedy which saw 143 people killed by a landfill slide triggered by a methane explosion, the Indonesian central government finally declared the 21st of February as Hari Peduli Sampah Nasional (National Day for Waste Awareness) to commemorate the victims in the hopes of such tragedies never occur again (Febriani, 2016). However,
these tragedies continue to occur across dumpsites in Indonesia (despite not being at the scale of Leuwigajah). In the city of Bogor there have been several fatal garbage avalanches at the Galuga TPA (Tempat Pembuangan Akhir) that have killed children/youth with ages ranging from 11 years old to 20 years old (Humaeni & Widjaya, 2010). As the process of locating landfills is challenging and is often conflict-ridden (Nguyen & Maclaren, 2007), there are numerous challenges for municipalities in developing countries to dispose of the vast amounts of non-biodegradable and food waste generated through modern consumption.

During the timeframe of the study, in January of 2016, a group comprising of hundreds of Bogor citizens blocked hundreds of garbage trucks heading to the TPA complaining about maggots scattered all over the street and the overwhelming stench caused by the TPA while threatening to overthrow the Mayor (Permana, 2016). Many were concerned that the garbage trucks routinely parked across the street from the local elementary school (Permana, 2016). By examining the issue of food waste from a consumption angle, it is clear that there is a level of responsibility between the government, producers, processors, the distributors of “food stuff” and even consumers, in replicating the infrastructures of food provisioning and waste that is based on an unjust system. The macro-level economic processes that have transformed the built environment of food provisioning infrastructures in Indonesia supports Evans’ (2011) analysis that there is a need to move beyond “blaming the consumer” in examining people’s everyday food wasting practices. This thesis concludes with a call for planners to develop cities based on closed loop principles.

7.1 Major Empirical Findings and Theoretical Contributions

This dissertation contributes to the global food waste literature and offers three major empirical and theoretical contributions. The first empirical contribution is an analysis of the transformation of Indonesia’s food consumption landscape through factors such as supermarket revolution and market deregulation and its impact on consumer food waste. Secondly, this thesis integrates a social justice lens
and includes considerations of privilege, which has thus far been absent in what has been a largely Eurocentric approach to the definition of food waste. The third empirical contribution identifies the role of urbanization as a process that has spatially and mentally distanced urban residents from the source of their food production and the impact of their consumption in the form of food wasting and packaging waste.

With regards to theoretical contributions, there are several contributions arising from this thesis. This study is the first to apply Gille’s (2012) food waste regime conceptual framework to explore the unequal power in the organization of risks and uncertainty between diverse food retailers (modern and traditional) and their subsequent impact on household food waste (Chapter 3), as well as between households of different incomes, especially employers and domestic helpers (Chapter 4). This dissertation is also the first to employ the conceptual framework of distancing to explain the role of urbanization and food packaging in the spatial and mental distancing process that results in increased food waste generation and an urban waste management crisis in Indonesia (as seen in Chapter 5). In Chapter 6, the quantitative study moves beyond the dominant behavioural theory framework and employs practice theory to demonstrate the role of the built environment in influencing practices associated with food provisioning such as shopping, consumption and waste management.

The following overview summarizes of the major empirical findings and theoretical contributions of each chapter. Following an overview summary of the chapters, in section 7.2 I provide recommendations and outline potential planning interventions that will address the issues outlined in the chapters and support a more sustainable food system in the City of Bogor, Indonesia.
7.1.1 Chapter 3: (Re)framing the food waste narrative: The infrastructure of urban food consumption and food waste in Indonesia

The first empirical chapter, *Reframing the food waste narrative: The infrastructure of urban food consumption and food waste in Indonesia*, outlines the important role of modern supermarkets and hypermarkets in creating an environment that encourages overconsumption, stocking up and the wasting of food. With respect to major findings, modern supermarket practices were found to increase the generation of food waste at the consumer level. The study found that modern supermarket practices have brought the stringent aesthetic standards and similar “buy one get one free” offers that are commonplace in the Global North to Indonesia. These stringent standards are a marked difference from offerings by traditional vendors. Furthermore, the study also found that upper and middle-income households have more ability to stock up while low-income Indonesian are largely still practicing a “buy today eat today” practice. However, the ability of Indonesians to continue the traditional “buy today eat today” practice and access seasonal as well as local foods will be impacted by the decline of traditional food retailers due to practices such as exclusion (restriction in some elite neighbourhoods), and unfair predatory pricing practiced by multinational modern supermarkets and minimarkets. Without understanding and connecting the spatial transformation and changing consumption patterns in Indonesia, planners cannot provide relevant food waste prevention and reduction policies. In section 7.2 I provide detailed recommendations on how planners can include priorities in urban development that promote long-term food security, accessibility to traditional vendors, as well as environmental sustainability in the management of food waste.
7.1.2 Chapter 4: Gifting, Ridding and The “everyday mundane”: The Role of Class and Privilege in Food Waste Generation in Indonesia

The second empirical chapter, “Gifting, Ridding and The “everyday mundane”: The Role of Class and Privilege in Food Waste Generation in Indonesia” is focused on the role of class and privilege in defining what is “food” and what is “waste.” As Graham and Marvin (2001) argue, the socioeconomies of cities are characterized by extreme disparities with increasing financial rewards for affluent professional classes and increasing impoverishment for the poor. In the case of Indonesia, the homogenization and conglomeration of industries, such as food retail, and the concentration of power by a few corporations have resulted in the marginalization of more and more people into volatile living conditions and precarious labour, such as domestic helpers. In this particular chapter, I bring up the typology of “people as waste infrastructure”. This is premised on the fact that practices of food sharing have markedly different characteristics between incomes. For example, it was found that food gifting between upper-income and middle-income households largely revolve around the giving or sharing of new (often excessive amounts) of foods. However, the food gifting from upper-income households to lower-income households generally consist of the “gifting” of unwanted surplus or leftovers. While the study acknowledged the altruistic intention behind some of the food gifting from the upper-income households to lower-income households, and the fact that in many cases the food contributions are appreciated to alleviate immediate hunger, it is also important to consider the fact that this solution is premised on maintaining the status quo of consumption patterns in upper and middle-income households while putting the burden of absorbing “waste” on the poor.
7.1.3 Chapter 5: Wasted Infrastructures: Urbanization, Distancing and Food Waste in Indonesia

Figure 14: (a) As of this writing, on the 5th of December 2017, the temporary dumpsite (TPS) has been sealed and developed into a house; (b) Banner announcing the removal of the TPS and movement to another district; c) After the closure of the TPS, Budi now has to wait hours every day on the side of the street for the municipal garbage truck to pick up the waste from his cart.

As Clapp (2002) argues, the role of “consuming” is a practice in the generation and distribution of waste. In Chapter 5 I argue that rapid urbanization enables distancing and produces an unjust system whereby the impact of food waste and its associated packaging is distanced from those who are privileged and brought nearer to those who are marginalized. This is exemplified through the distancing of the food supply chain in the modern supermarket model to cater to the food desires of a growing urban and middle-class population while competing with traditional food retail that supports the consumption needs of lower-income households. Furthermore, the process of urbanization has also led to the issue of land scarcity that has made it difficult for urbanites to manage their food waste sustainably. This is further exacerbated by modern food packaging such as plastic and Styrofoam. The chapter argues that modern food packaging and long-distance food supply chain go hand in hand.
Despite progressive regulations in Indonesia requiring that suppliers/ producers pay for the collection and management of food packaging waste, and that developers must provide space for the segregation of waste (as outlined in the Regulation from the Minister of Environment, Government of Republic Indonesia Number 16, 2011 regarding the planning and waste management of households.), policy makers in Bogor have largely focused on reducing food packaging by emphasizing arts and crafts programs that teach lower-income households to repurpose food packaging waste rather than implementing the waste regulations. This policy approach is not effective in addressing the massive scale of waste and puts the burden of waste reduction on low-income households. From a regulatory framework, it is important to consider that Clapp’s (2002) question of “where and why waste ends up where it does and who is affected by it?” is, in fact, a question of power. Clapp’s recognition of the role of power is buttressed by the food waste regime conceptual framework as Gille argues that “the ability to shield oneself from risk and to increase another’s exposure to them is a key source and result of power” (2013, 31). The push for problem solving on the poor rather than on large suppliers and retailers reflects the power structure of the food and waste system in Indonesia.

This chapter also demonstrates the value of traditional food packaging, such as banana leaf and bamboo, in facilitating a more sustainable urban environment and improving households’ ability to manage their food waste. Furthermore, it concludes that the development and facilitation of neighbourhood closed loop food systems could help in connecting urban residents with food production and returning the nutrients from organic waste back to the land. However, as will be noted in more detail (See section 7.2 Planning Recommendations) the key ingredient to the success of this intervention is securing and allocating urban lands to bring both food production and nutrients from organic waste closer to each other, therefore challenging the dominant distancing process.
Chapter 6: The Influence of Income and Retail Choice on Household Food Waste in Indonesia

The use of practice theory to better understand the issue of food waste has largely been applied through qualitative ethnographic studies. This chapter contributes to both theoretical and methodological development by demonstrating the application of practice theory in a mixed methods study on food waste. Studies on food waste have demonstrated the need to move beyond the dominant ABC model to understand the complex practices that influence food wasting and therefore develop better interventions (Lee and Soma, 2016; Lee, 2017; Evans; 2014). This chapter demonstrates the importance of considering three categories that influence practice (material, meaning and competence) in shaping consumption practices in Indonesia. It shines light on the importance of developing context-appropriate food waste reduction interventions that recognizes the role of income and diverse types of retail in influencing the food provisioning practices of low, middle and upper-income households.

As demonstrated in the chapter, there is a lack of food waste research on the food wasting practices of households of diverse incomes. Research on the link between food retail and food wasting is also lacking. In the context of Bogor, Indonesia, investigating the role of diverse retail types is critical due to the diversity of food products offered, amount of foods sold, and the scale of diverse retail types (modern supermarket, mobile vegetable vendors, wetmarkets, warungs). By understanding the influence of retail, it is possible to support better urban retail development practices and policies.

In the chapter, I demonstrate that empirical findings from my qualitative study are supported by the quantitative survey based on 323 households. Most importantly, spatial consideration in the form of the type of retail infrastructure is found to be a critical factor in influencing food provisioning practices in urban areas and the ability of diverse income groups to participate in more sustainable food waste management practices. I found a statistically significant relationship between income and food waste (with more food waste generated by upper income households), as well as a statistically significant relationship
between income and the choice to shop at a particular type of food retail (with low-income households almost exclusively shopping at warungs, and upper-income households mostly shopping at modern supermarkets). Those shopping at modern supermarkets were found to stock up and shop less frequently while those with low-income and shopping at warungs in general shop daily in small amounts. In addition to spatial consideration, the study found that a significant number of Indonesians (92.6%) do not compost their food waste despite many stating that they know how to compost food waste. This finding demonstrates the limitations of interventions and approaches that are focused on solely increasing awareness and education to spark behavioural change.

7.2 Planning Recommendations

In the first chapter (Introduction) of this dissertation, I posed three research questions. The last question relates to planning interventions, and more specifically asks, “how can my findings be used by urban planners to develop minimization and prevention strategies to reduce the generation of household food waste in Indonesia?” The following findings and recommendations will be forwarded in a concise report (in Bahasa Indonesia) to the Regional Planning Department BAPPEDA, as well as relevant municipal departments such as the Department of Cleansing and Sanitation (Dinas Kebersihan), Department of Environment (Dinas Lingkungan Hidup) the Bogor Agriculture University (IPB). It is important to note that I will largely confine my recommendations within the field of planning. In this dissertation, there are several issues that are amenable to planning solutions. These include among others: 1) the issue of spatial restrictions affecting the traditional mobile vendors; 2) the lack of waste infrastructure to manage food waste in neighbourhoods; 3) the lack of both financial and educational resources to develop a more sustainable food waste management practice; 4) land scarcity to develop a closed loop food system connecting urban food production and food waste management; 5) the rapid expansion of the supermarket model and the resulting decline in traditional wetmarkets; 6) the lack of
emphasis on food systems planning in municipal planning considerations and by professional planners in general; 7) the issue of putting the burden on the poor to address food waste and packaging waste through informal methods rather than targeting the producers; 8) the issue of overconsumption/ food surplus; and 9) the disparity in food waste generation between households of diverse incomes.

As the research progressed, I recognized that efforts to increase food waste prevention and reduction are connected to a broader strategy towards developing a more sustainable food system and increasing food security. Beyond the prevention and reduction of food waste, the issues of food waste and food insecurity can be addressed by planners within the umbrella of food systems planning (Pothukuchi and Kaufman, 2000; Battersby, 2017; Raja, Morgan and Hall, 2017) and within a paradigm that promotes a closed loop food system. The following are 9 recommendations to address the issue of household food waste in Bogor, Indonesia:

1. **Quantification of food waste via regular municipal food waste audit**

   At the time of the research, the most recent food waste data provided by the Municipality was based on findings from a food waste audit conducted in 2007. While lack of resources may prevent the municipality from conducting regular audits, food waste audits can also be conducted through partnerships with academic institutions such as IPB and UNPAK. Prioritizing quantification and the availability of current data will enable the municipality to measure impacts of food waste reduction initiatives, to set benchmarks and plan infrastructural spending for the management of food waste.

2. **Planners should offer design guidelines and include requirements in planning proposals to develop food hubs that integrate traditional small and medium-scale food vendors as part of future high-rise and gated housing development.**

   I have demonstrated in Chapters, 3, 5 and 6 that the role of traditional vendors in supporting a food system based on local and seasonal foods as well as a “buy today eat today” is vital and requires that planners and policy makers conduct further studies on how to support small and medium scale food
infrastructures. In North America, mobile food market initiatives (vendors selling from a van or bus) have been created to access spaces that are hard to reach or have less access to fresh foods (Widener et al., 2012). Another important innovation to support small and medium scale food enterprises have been explored within the concept of “food hubs” (Alison Blay-Palmer et al., 2013; Morley et al, 2008; Campbell and MacRae, 2013). Food hubs as defined by Blay-Palmer et al (2013) include:

networks and intersections of grassroots, community-based organizations and individuals that work together to build increasingly socially just, economically robust and ecologically sound food systems that connect farmers with consumers as directly as possible (p. 4).

Within the context of Indonesia (as noted in Chapter 3) the infrastructure supporting farmers and small/medium traditional food vendors already exists within the established network of mobile vegetable vendors (pushcarts and motorcycles), and warung vendors, who purchase all of their goods from the traditional wetmarkets that is supplied by local farmers. However, the challenges as mentioned in Chapter 3 is that mobile vendors are being restricted from certain neighbourhoods and the gated condominium model are often strategically developed near and or along with the development of hypermarkets and supermarkets. The ripple impact from the exclusion of the mobile vendors will also affect wet markets as they also rely on mobile vendors to purchase their goods. Further, the downward trend for mobile vendors and wetmarkets will then impact local farmers (supplying the overwhelming majority of the foods sold at wet markets).

The gated development model in conjunction with the development of adjoining hypermarkets further interferes with small vendors’ ability to sell foods due to price competition. Where there are limitations for mobile vendors, planners in Bogor should develop design guidelines to facilitate and encourage the creation of food hubs in new developments. Food hubs in this case are spaces that allow a dedicated space for traditional mobile vegetable vendors to congregate in the morning. In the USA, USDA (U.S Department Agriculture) supported food hubs include 184 projects consisting of non-profits, co-ops,
buying clubs, direct farms sales, box delivery projects, virtual farmers’ markets and others (Alison Blay-Palmer et al., 2013). These food hubs where mobile vegetable vendors can congregate should be located in a strategic location accessible to the community. In the gated neighbourhoods, RUKO (Rumah Toko-“House Stores”) is common. RUKO is a mixed-used market hub system whereby smaller-independent businesses can offer services ranging from clothing stores and restaurants to pet care and health clinics all within a “home-based” format. It would be possible to integrate a space where smaller food vendors and mobile vendors can congregate and sell their wares at a particular time (mostly in the morning) in RUKO areas. For example, in one of the neighbourhoods located in close proximity to the areas studied, a small public park/ playground in the centre of the neighbourhood provided space that would allow mobile vendors to congregate in the morning. This provided the vendors a safe space away from traffic to sell, while also facilitating a short walking distance for buyers to shop and obtain local foods. It is also important to note that food hubs should be regulated, and guidelines developed (to prevent conflict) to ensure a balance of cleanliness and the accessibility of sidewalks/ streets for the general public.

3. **Support for entrepreneurship development program to offer training for enterprises that promote food waste prevention and reduction, circular economy, as well as improved food security (in collaboration with existing City-wide mentorship program and Universities in Bogor).**

The danger in conflating the issue of food waste with food insecurity is well documented (Fisher and Jayaraman, 2017; Tarasuk and Eakin, 2005). The conflation occurs when policymakers and activists argue that giving corporate “food waste” to the poor is a “win win” both in efforts to reduce food waste and improve food security (Caplan, 2017). Notably, a growing number of countries (France, U.S, Italy) have pushed policies promoting corporate tax incentives for supermarkets to donate their “food waste” or unwanted surplus to food charities in lieu of serious efforts by the government to address the growing
issue of poverty. The dangers associated with reliance on charity from corporate food waste include but are not limited to: 1) Governments abdicating their roles in ensuring the citizen’s right to food by relying on charitable efforts; 2) The development of a secondary market of lower tiered, lower quality foods exemplified in the term “rubbish food for rubbish people” (Alexander, 2009); 3) Stigmatization of food recipients (Caplan, 2017, Tarasuk and Eakin, 2005); 4) Food service and employees of major retailers are often the recipients of these corporate donations due to their low pay (Fisher and Jayaraman, 2017); 5) CSR (Corporate social Responsibility) used as a mask to improve company image while those same companies contribute to extreme inequality that results in food poverty; 6) Sporadic, random, and inappropriate donations which result in additional tipping fees for charities that cannot utilize food donated (Mansfield et al., 2016); and 7) Normalizing poverty and constructing indifference (Caplan, 2017). While these concerns may specifically target or address corporate-related donations, it serves as a caution for Indonesian policymakers not to institutionalize the gifting of food waste to the poor by replicating the Western food-bank model.

In outlining and challenging some of the practices around the gifting of surplus food to domestic helpers, it is not the goal of this dissertation to recommend that surplus food never be gifted to the poor or to criticize those who give surplus food. However, as noted by the examples in Chapter 4, the gifting of surplus food (randomly and sporadically) cannot resolve long-term food insecurity and poverty due to lack of employment, nor does it address long term issues around food waste. Addressing the issues of overconsumption in food provisioning and food insecurity requires solutions that address the root causes of household over-provisioning (especially in the upper-income households). There are innovative ways to approach the issue of surplus food and household food waste that can also address the issue of food insecurity. An innovative example documented in this thesis is the catfish and urban agriculture operation implemented in Indah’s household. The rearing of food-waste eating catfish is a household-based solution
that is unique to Indonesia (see thepigidea .org by Tristram Stuart for a U.K example). In addition, it is interesting to note that it is only recently (March of 2018) that the City of Toronto is piloting backyard chickens in four wards and catching up to Indonesia. In Indonesia as noted in Chapter 6 Figure 12, chickens regularly roam and are often fed food scraps by respondents. In many ways, the integration of animals as part of a more sustainable approach to managing organic waste can be said to emerge from the Global South. While Indah has space to run the operation, it is noteworthy that as an upper-income household, she is significantly reducing her food waste while creating employment opportunities. Food scraps from the household are used to feed catfish reared in her backyard and this not only supplements the family’s diet, they are also sold for additional income. Some food scraps are also composted of which the resulting product is used to fertilize the salad greens and vegetables she grows. The operation is of a sufficient size (small-scale) that it creates employment opportunities for low-income community members and can be scaled up at a neighbourhood level. Another example that might be implemented in Indonesia are “food waste” cafes similar to the L.A Kitchen project or the InStock Restaurant Franchise in the Netherlands. The L.A Kitchen project reclaims food that would otherwise be discarded by supermarkets and farms and creates a culinary training program for low-income community members. Their program also creates employment opportunities in transforming surplus food into restaurant quality meals which is served in the café and in distributed to social agencies.

Encouraging innovative and systematic solutions to address food waste can be supported through planning consultation held at the Kelurahan level and attended by representatives of RT, RW leaders as well as community members. Social innovation and micro-small-medium business (UMKM- Usaha Mikro Kecil Menengah) workshops can be integrated through free mentorship opportunities offered weekly through the “Komunitas Bogor Berdaya.” For an example on social innovation approaches to food waste see: foodsystemsllab.ca, a social innovation lab that I co-founded.
4. Support plans for urban wetmarket revitalization that includes input and collaboration from wetmarket vendors. Market revitalization plans should also include a campaign to return to the “bongsaung” reusable bags and banana leaf/paper packaging that were traditionally used in wetmarkets before the advent of plastic packaging.

In May of 2017, the President of Indonesia Joko Widodo rolled out a plan to support the revitalization of traditional markets under the name NAWACITA implemented through the RPJM 5 year plan 2015-2019 (Rencana Pembangunan Jangka Menengah Daerah/ Mid-term Regional Development Plan). However, under the current program, only certain markets (mainly in rural areas) are eligible. While such revitalization programs in rural areas are important, it is also critical to support the revitalization of wetmarkets in urban areas as they are currently most affected by the expansion of modern hypermarkets and supermarkets and the rapid pace of urbanization. Findings from Toronto by Donald and Blay-Palmer (2006) illustrate that while urban local artisanal markets in the West are often seen as places for the “urban elites” or the “talent class,” they can also offer opportunities for more inclusive urban development (Donald and Blay-Palmer, 2006). In the case of Indonesia, traditional wetmarkets predate supermarkets, and support a seasonal, local food system. In addition, due to more informal requirements with respect to becoming a traditional vendor, traditional vending creates employment opportunities for many lower-income community members. However, as documented in this thesis and in other countries such as Thailand (Gorton, Sauer, and Supatpongkul, 2011), supermarkets are perceived to offer better food safety. Wetmarket revitalization can improve issues related to cleanliness, food safety, and accessibility. Improvements to wetmarket design including designated spaces for parking, better access to drop off hubs for public transportation, and better management of waste will also make wetmarkets more appealing to customers. Therefore, the wetmarket revitalization program initiated by President Jokowi, which includes funding support for all of these measures, should also be rolled out to the urban centres such as Bogor where wetmarkets are under increasing pressure to compete with supermarkets.
Another component of wetmarket revitalization is the promotion of traditional practices such as using bongsang (reusable and biodegradable bamboo baskets), as well as banana leaf (daun pisang) and paper packaging for both customers and the vendors in the wetmarket. Respondents in this study have complained about the cleanliness of the market and as noted in the research, plastic waste is especially problematic as it contaminates composting feedstock and makes waste management more challenging.

5. Identify and allocate urban lands for community food production while integrating food waste management in partnership with the neighbourhood government model (Rukun Tetangga, Rukun Warga and Kelurahan) with implementation via support of academic Institutions through community food mapping/ community food assessment.

![Figure 15: Vacant plot of land used by the community to rear chickens](image)

As illustrated in Chapter 5, low-income community members had more food security when land was available to grow and pick their own food. It is through planning policies to support land access for food growing and integrating composting/vermicomposting facilities to manage food waste that members of these groups can have access to a living wage while preventing the harmful impacts of open dumping.
The key ingredient to the success of this intervention is securing and allocating urban lands to bring both food production and nutrients from organic waste near, therefore challenging the dominant distancing process. To secure access to land, planners must first apply community food mapping, or community food assessment to document the food resources and land available in a particular neighbourhood.

Community food mapping can be done in collaboration with Bogor Agriculture University and Universitas Pakuan’s planning program and with the support of an official letter from the Lurah (head of the Kelurahan). For example, in one of the field sites, there were several empty plots of land that had turned into a dumping ground for rubbish or were derelict. On one of the sites, some of the low-income community members had built chicken coops to raise their chickens. While they have used the land for years, the community expects that at any moment, the land may be taken back by the developers. The allocation of a plot of land for community food production and food waste management should be required under all new development plans.

In older neighbourhoods, such as some of the ones encountered in the study, under the collaboration of the neighbourhood (Rukun Tetangga), community (Rukun Warga) and Kelurahan (Ward) any abandoned plot of land should be re-allocated by the municipal government for the purpose of urban agriculture after a certain number of years (for example: 5 years). This type of initiative is already being implemented in Jakarta with the Indonesia Gardening Community (Komunitas Indonesia Berkebun) where the group utilizes vacant lots for urban farming. More importantly, on December 28th 2017, the Vice-Governor of Jakarta Sandiaga Uno officially launched Jakarta’s urban farming program (pertanian perkotaan) where the Regionally Owned Enterprises BUMD (Badan Usaha Milik Daerah) are required to purchase the crops from the urban farming initiatives. This initiative has legitimized urban agriculture and the usage of land for farming purposes. In fact, a new term called “Agro-Tourism” has created a trend where urban agriculture in Indonesian cities is seen as a way to bring tourism and business. These types
of initiatives support the position that planners should require that all new housing development proposals incorporate a plan for a closed loop food production and food waste management system.

6. Invest in an educational/public engagement campaign to raise awareness about composting, food waste prevention, and reduction (at the household and neighbourhoods level), while including financial investment in infrastructures for source separation facilities in every Kelurahan as part of a broader campaign for a greener Bogor.

An important addition to the sixth recommendation on allocating urban land to serve the purpose of food production and composting, is the need to invest in education as well as public engagement. Most recently, the City of Bogor won the World Wildlife Fund (WWF) 2016 We Love Cities “Most Lovable City” award for public engagement in environmental sustainability initiatives. Beating 46 cities from 21 countries around the world, Bogor has shown the ability to reach out to its citizens and engage the community. This capacity can be built to make a real impact in terms of household food waste reduction, prevention and management. Most recently (as of 2017), the City of Bogor Sanitation Department created a booklet (See Figure 16 below) that explains the basics of household composting and community-based waste management. However, these new booklets (published in 2017) are not widely distributed and have not achieved a broader public engagement as of yet.

**Figure 16:** (a) Front cover of booklet on community-based waste management published in 2017; b) Page explaining how to do household composting.
In the Global South, there are numerous case studies evidencing the barriers to running a successful composting operation. Most importantly, these barriers include the issue of scaling up, willingness to pay for the compost product, odour issues, and marketing the compost products (Pasang et al., 2007). Most examples of community-based composting in the Global South (including in Indonesia) do not include cases where food production occurs in the same site as the composting facility. In an urban centre such as Bogor, where low-income community members are struggling with the lack of waste infrastructure, lack of access to sufficient fresh foods, and lack of access to employment opportunities, financial investment in infrastructure to manage food waste on site can be a significant source of relief to the overburdened landfills while spurring local enterprise. When the Mayor of Bogor faced a boycott over the issue of the overburdened landfill in Galuga and garbage from the city was blocked for four days by residents, it was clear that the waste issue had intensified and created the political pressure to address the problem.

This study also found that many respondents know how to compost food waste. However, the issue mainly lies with the lack of space. The waste collector interviewed in the study (Budi) also knows how to compost but lacks the space, equipment, and pay to manage the food waste. Infrastructure investment by the government for community food production at a neighbourhood level should include financial resources for a basic composting facility and training. Public engagement will increase support for composting initiatives. Furthermore, public engagement and awareness campaigns should also be rolled out to support onsite (backyard/ front yard) composting where neighbourhood composting is difficult and costly. Specifically, strategies to prevent rodents and stray animals from accessing the compost (rodents and stray animals often discourage homeowners from composting) should be incorporated in the training. Workshops can be conducted by representatives which include government, RT, and RW leaders during community meetings. To support better food waste management, policymakers and planners need to designate spaces that will facilitate composting and support the community with the necessary technical,
financial, and educational resources. Willingness to separate waste by the households may create a barrier in composting initiatives. However, in the neighbourhood included in the study, an initial composting project did not require source separation as it was conducted by the waste collector which meant that source separation by the household was unnecessary. Unfortunately, that project was discontinued due to the lack of technical support from the Cleansing and Sanitation Department. In this study, homeowners knew that there was reason to source separate as everything will be mixed at the temporary dumpsite. As the Cleansing Department has embarked on a new initiative to focus on diverting food waste in 2017, and in combination with recommendations for public engagement, it is reasonable to expect a more dedicated commitment to ensure the program’s success.

7. **Develop a City of Bogor Food Policy Council integrating consultation from local leaders representing the Kelurahan of Bogor to address food-related issues (including food waste) in the City.**

Indonesia’s government is structured in a way that includes the neighbourhood level which is not a common practice in the North American or Western context. A Lurah is the main government representative (civil servant) appointed by the government at the (administrative village) level in West Java and is someone who is connected with the community (neighbourhood cluster) leader (Rukun Warga). The Rukun Warga leader heads a cluster of neighbourhood leaders (Rukun Tetangga) who represent the voices of a group of homeowners in a particular neighbourhood. This structure facilitates ease in the dissemination of information, offers opportunities to relay complaints, and creates a structure to implement initiatives from the higher levels of government. A food policy council in Bogor hosted under one of the departments in Bogor or under the Mayor’s office is a natural fit as members of the council can relay information to the Kelurahan level (administrative village) which will then relay said information to the neighbourhood cluster level (RW) and then to the neighbourhood leader (Rukun Tetangga).
The neighbourhood leadership position (RT) requires an election and nomination from the community although this is not monitored by the government or the Lurah. This means that community members in Bogor are generally active in the political realm. The City of Toronto is the first city to host a policy council (Toronto Food Policy Council) integrated with the Department of Public Health. Through its establishment, it has managed to connect planners, community leaders, policy makers, academics, civil society organizations, and industry leaders to promote food security in the City of Toronto (see Roberts, 2012). I was one of the founding members of the Toronto Youth Food Policy Council, the first youth-led policy council in the world. Youth representation is now officially ingrained in the Toronto Food Policy Council membership. A Bogor Food Policy Council can bring Bogor under the umbrella of a wider global alliance working on a resilient urban food system (See Milan Urban Food Pact). However, the nature of a Bogor Food Policy Council would likely differ due to the administratively strong neighbourhood leadership roles of the RT and RW leaders in Indonesia. Due to the diversity of the wards and neighbourhoods in Bogor, it is critical to ensure diverse representation in the membership of the council which includes representation by small vendors and informal food entrepreneurs.

8. **Include and strengthen food considerations in local plans addressing infrastructure support for food production, distribution, retail and food waste disposal.**

Planners should commit to include priorities in urban development that promote long-term food security, accessibility to traditional vendors, as well as environmental sustainability by including more detailed guidance in zoning (as documented in the lack of specificity by the zoning regulations promoted by regulation No 112/2007) and regulatory reforms that integrate considerations for a sustainable food system in city planning. Currently, there are numerous opportunities for food system considerations in Bogor. Bogor’s Long-Term (2011-2031) Planning document (*Rencana Tata Ruang Wilayah –RTRW 2011-2031*) includes plans and a commitment to develop Bogor’s culinary scene (wisata kuliner), the allocation of space for street vendors (*pedagang kaki lima*), support for the development and better management of
traditional wet markets, the preservation of irrigated farm land, as well as the management of farmland for food research and fruit orchards (City of Bogor Planning Department (BAPPEDA), 2011). However, in terms of waste management, the City plans to increase the development of community-based waste management under the principles of 3R without any mention of organic waste or plans for composting infrastructure.

Beyond the planning department, the Waste and Sanitation Department is currently working on composting initiatives. Therefore, better collaboration and communication between the departments should be fostered. Other alternative methods promoted by the planning department such as anaerobic digesters, seem to be disconnected from initiatives by the Waste and Sanitation Department (Dinas Kebersihan). The current plan has not yet connected the linkages between food production, consumption and waste management. The plan also provides overarching principles without details on how these principles will be implemented or monitored. The development of an independent body affiliated with the City such as a food policy council (recommendation #9), will support efforts for accountability. A separate body, such as a Food Policy Council, with representation from affected stakeholders may support the overarching goals of ensuring that the planning document’s objectives with respect to food goals and food waste management are achieved, mobilized, and implemented.

9. **Raising awareness of the need to integrate food systems consideration into urban planning & urban development in Indonesia via planning education.**

As noted in this thesis, the term food system planning was established by Pothukuchi and Kaufman (2000) in the 21st century. However, the concept itself is not new. There are numerous town plans in the past (see for example: Ebenezer Howard “Garden Cities”) that were developed with consideration for food (notably the supplying of food from local agriculture to the city), protection of farmland through greenbelts, and the management of food waste (Steel, 2009; Vitiello and Brinkley, 2014). The privatization of food system responsibilities to broader market forces based on long-distance industrial food supply chains (e.g on
multinational corporations) have disrupted this connection. The Indonesian planners I interviewed were well-versed in Western urban theories, best practices, and concepts, such as sustainability, sprawl etc. However, they were not aware of the connection between the field of planning and food systems. Without understanding the principles of a closed loop food system and the paradigm of a circular economy, it would be difficult to support the implementation of associated waste reduction policies and regulations.

Planning curricula in the North have started to include food systems planning considerations (Soma and Wakefield, 2011; Morgan, 2009) with the result being the growth of support and awareness for urban agriculture initiatives, farmers’ markets, community food mapping, agricultural land preservation, and the rise of planners focusing on sustainable food systems. The City of Bogor is home to several universities with planning programs (Universitas Pakuan and Bogor Agricultural University). Most importantly, Bogor is the site of the largest agricultural research university in Indonesia (Bogor Agriculture University) set in an urban context. Food system planning can be integrated into the core curriculum of the Master’s Program in Regional Planning (Magister Ilmu Perencanaan Wilayah) offered by the Bogor Agricultural University with input and inter-departmental collaboration from other units dealing with agriculture, soil science etc. Other universities such as ITB (Bandung Institute of Technology) located in the City of Bandung also offer a highly respected planning program. Collaboration between planning programs should be encouraged to develop food system specializations (research streams) that is tailored to the local context, and food planning associations. The emergence of theoretical and empirical contributions from Indonesia and other cities from the Global South are vital to the development of best practices on a global scale. Furthermore, a food system research stream can lead to a growing awareness for future urban planners in Indonesia, on the importance of food systems considerations in the planning field.
7.3 Future Research Directions

In my dissertation, I compared food consumption and food provisioning practices between diverse households and in doing so, observed significant differences in how food was presented, branded and packaged at different retail formats including modern supermarkets and traditional food vendors. Most importantly, respondents in my Indonesian study reflected that food packaging waste became challenging to manage when biodegradable traditional wraps and packaging made with banana leaves, pandan leaf or bamboo gave way to Styrofoam, plastic and tin. In countries with a lack of waste infrastructure, non-biodegradable food packaging can act as a barrier for more sustainable food waste management such as home-based composting. Packaging also creates problems that disproportionately impact the lower income communities such as flooding due to waste clogging the rivers. In essence, the existence of non-biodegradable packaging has resulted in the need for Indonesians to move toward a more centralized, complex and long-distance waste collection system to keep waste “out of sight and out of mind.”

Inspired by this issue, in the future, I hope to conduct further research on the role of food packaging in food waste reduction. This concern is premised on the fact that there is a dominant narrative promoted by global institutions such as the FAO and the packaging industry to emphasize the positive role of packaging in food waste reduction (See Williams and Wikström, 2011). There is a lot at stake with regards to the role of food packaging in food waste reduction as well as in urban planning. In the Global North context, “the rise of the waste crisis in urban governance in the mid-1960s has been directly connected to the proliferation of food packaging” (Hawkins, 2012, 66). With respect to food consumption, concerns over the cost of managing food waste should also be coupled with consideration for the associated cost of municipal waste collection and the environmental impact caused by the generation of food packaging waste. What currently lies with the mantra of “food packaging as a food waste solution” supported by international institutions such as the FAO, and the packaging industry, is the premise that food should
continue to be shipped from distant places, branded and protected with packaging. Therefore, there is a need to better understand the international discourse of global actors and international institutions around food waste and food packaging. My future study will investigate the role of packaging in this distancing process by critically analyzing the discourse of food waste reduction through packaging and examining alternative approaches to food waste such as the emerging rise of zero waste grocery store initiatives around the world. While these zero waste store initiatives are currently located in the Global North, the reusable and zero waste model were commonplace in many traditional markets of the Global South such as in pasar (wet markets) and warungs before the advent of cheap plastic packaging.

Another research direction that I did not have the time to answer is on the issue of agricultural waste (food loss). In my study, I found that supermarkets enforced stringent aesthetic standards that were not enforced with other more traditional markets. I would be interested in exploring the issue of farm-level waste due to retail standards as the argument is that most farm waste is caused due to lack of modern storage and handling infrastructure. Investigating this issue would require a study design focusing on farm operations and logistics.

We currently have enough food to feed over 10 billion people. However, food is wasted to the tune of one trillion dollars globally despite there being one billion hungry people around the world. With a growing population estimated to reach 9 billion by 2050, it is time that planners move beyond stop gap solutions to address the issue of food waste and food insecurity. To prevent and reduce food waste, it is important to recognize the role of planners in developing both food provisioning and waste infrastructures that are based on the principles of social and environmental justice. The goal of sustainable and just food systems entail that urban spaces enable residents to prevent and better manage food waste. The step towards sustainability will start with acknowledging the importance of food systems planning.
considerations in the urban agenda and recognizing the need for future research in the development of closed loop food systems in Indonesia and beyond.
Works Cited


Donald, B. (2008). Food systems planning and sustainable cities and regions: The role of the firm in sustainable food capitalism. Regional Studies, 42(9), 1251-1262.


Sahlin M (1972) *Stone Age Economics*. Aldine-Ashterton: Chicago


Appendix A

Informed Consent Form

For the Study: Planning from “table to dump”: Analyzing household food consumption and food waste in urban Indonesia

Date:
Researcher:
Tamara Soma, Doctoral Candidate (Planning), University of Toronto
Telephone:
Email:

Purpose of the Research:
This study seeks to explore and analyze the ways in which urban households in Indonesia consume, obtain and dispose of food. By collecting this data, the study hopes to understand how cultural, environmental, economic and religious factors may influence food consumption and food wasting. Data from the study may assist policy makers with better management of food waste. This research project is for the purpose of fulfilling the dissertation requirement to graduate from the Doctoral in Planning program at the University of Toronto.

What You Will Be Asked to Do in the Research:
a) For participants of the household study: the research requests that you to participate in a study on household food consumption for approximately three months (May 2014 to end of August 2014) with a total of approximately 5 household visits. This research will involve repeat semi-structured interviews, participant observation in the house, allowing me to go along on shopping trips, allowing me to conduct food inventories, filling out a food diary, and allowing me to take pictures of food that is consumed and wasted. I will visit the house at a mutually agreed upon time on at least five occasions. Your participation will assist my understanding of the ways in which urban households in Indonesia consume and manage food waste. With your permission, the interviews will be recorded. During participant observation, you may be quoted in the study. Each interview will last between one to two hours. You may choose not to answer any question.
b) For key-informant interview: the researcher will ask your permission to tape the interview. You may choose not to answer any questions and you may choose anonymity.

Privacy/Confidentiality:
For participants in the household study. All information you supply during the research will be held in confidence and your name will not appear in any report or publication of the research. Your data will be safely stored in a locked facility in my personal residence and only I will have access to this information. The paper data will be destroyed/deleted three years after the completion of the study and the audio data will be deleted after transcription and translation is completed. The researcher plans to publish the results of this study in academic journals and provide short summary reports on her findings to all participants who request them.
For Key Informants: All information you supply during the research will be held in confidence and unless you choose otherwise, your name will not appear in any report or publication of the research. You have the option to allow me to identify you by your occupation, organization or your name. Your data will be safely stored in a locked facility in my personal residence and only I will have access to this information. Audio data from the interview will be deleted after transcription and translation is completed. The researcher plans to publish the result of this study in academic journals and will provide a short summary report on her findings to all participants who request them.

Risks:
For participants in the household study:
In some cases, some households may feel embarrassed about revealing their food consumption and food wasting practices. My role is to document diverse ways of household consumption and not to judge the participants consumption choices. It is important to note that participation is anonymous and your identities will not be revealed.

My research also requires frequent visitation and this may result in less privacy. However, the scheduling of visits will be based on what works best for each participants. Therefore, I will only conduct household visits when it is convenient for the participants. My visit and observation will only focus on documenting moments of food consumption such as cooking, shopping, eating and food disposal.

For Key Informants: There are no known risks from your participation in this study. The key informants may choose to not answer the interview questions.

Benefits: There is monetary or in-kind compensation for participation in the household research. The benefits of your participation may lead to a better understanding of the management of food waste and therefore improved policies on waste collection. The participants who have requested to receive the study will be provided with a concise report. I will provide access to this information by directly providing the households with the reports (paper copy or an electronic copy).

Voluntary Participation & Withdrawal from the Study:

a) For Household Study Only: Your participation in the study is completely voluntary. You can inform me in person, contact me via email or by phone, should you decide to withdraw from the study. Participants may withdraw from the research by August 15th 2014. You have the choice to allow/not allow me to use the data that I have collected on your household up to that point. Should you decide not to give me permission, all associated data collected will be immediately destroyed wherever possible. Should you withdraw from the study, your compensation will be pro-rated.

b) For Key informant interviews only: Your participation in the study is completely voluntary and you may choose to stop participating at any time. You can inform me in person, contact me via email or by phone should you decide to withdraw from the study. In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible.
Questions About the Research:
If you have any questions about this study, or about your rights as a participant in the study, please contact me at the address provided above, the Faculty supervisor, ______or the University of Toronto Ethics Review Office: Tel (416-946-3273), email (ethics.review@utoronto.ca).

Signatures:
I, (print name) ______________________________, consent to participate in the study on food consumption and food waste conducted by Tammara Soma. I have had the opportunity to ask questions about my involvement in this study, and to receive any additional details I wanted to know about the study.

Will you allow this interview to be tape recorded? Yes ( ) No ( )

For key informants:
Will you allow me to identify you by name in my study? Yes ( ) No ( )
Will you allow me to identify you by organization in my study? Yes ( ) No ( )
Will you allow me to identify you by the type of job you do in my study? (e.g. planner, food retailer, food vendor) Yes ( ) No ( )

Participant
Signature ____________________________ Date ____________________________
Appendix B

Verbal Introduction Script:

Hello, my name is Tammara Soma and I am a Doctoral student in the planning program at the University of Toronto. I am conducting a survey to get a better understanding around household food shopping, food consumption and food wasting practices in Bogor.

Your house was selected at random. The survey is anonymous and I will not collect any names or addresses. You can choose not to answer any question and participation in the survey is completely voluntary. If you decide to participate, your responses will help me understand the potential issues relating to household food waste in Bogor. The survey should take about 15 minutes to complete. Would you like to participate?

If you have any questions later, you can contact me at the following number (will obtain a local number)
Appendix C

Letter of Information

For the Study: Planning from “table to dump”: Analyzing household food consumption and food waste in urban Indonesia

Purpose of the Research:
This study seeks to explore and analyze the ways in which urban households in Indonesia consume, obtain and dispose of food. By collecting this data, the study hopes to understand how cultural, environmental, economic and religious factors may influence food consumption and food wasting. Data from the study may assist policy makers with better management of food waste.

Clearly circle the answer that best represent your views using a pen or pencil. This questionnaire takes about 15 minutes to complete.

Risks:
There are no known risks from your participation in filling this questionnaire. The survey is completely anonymous. You may choose to not answer any of the questions in the questionnaire.

Benefits: The benefits of your participation may lead to a better understanding of the management of food waste and therefore improved policies on waste collection.

Voluntary Participation & Withdrawal from the Study:
Participation in this study is voluntary. Should you refuse to participate, simply do not fill out the questionnaire.

Consent
Completion of the survey is indication of your consent to participate.

Questions About the Research:
If you have any questions about this study, contact Tammara Soma:____. For questions about your rights as a participant in this study, you may contact the University of Toronto Ethics Review Office: Tel (416-946-3273), email (ethics.review@utoronto.ca).
Appendix D

HOUSEHOLD FOOD WASTE SURVEY

Research: Planning from “Table to Dump”: Analyzing Household Food Waste in Urban Indonesia
Investigator: Tamara Soma Ph.D Candidate, University of Toronto (Sponsor: Institut Pertanian Bogor)

The purpose of this research and survey is to understand the household food consumption patterns, factors that cause the wasting of food and the management of food waste.

Date:
Neighbourhood District (RT/RW)

A  How much are you responsible for groceries/ food purchasing in your household?
B  How much are you responsible for food preparation and cooking in your household?

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is my full responsibility/ It is largely my responsibility</td>
<td>☐ 1</td>
</tr>
<tr>
<td>I am half responsible</td>
<td>☐ 2</td>
</tr>
<tr>
<td>I am only partially responsible (less than half)</td>
<td>☐ 3</td>
</tr>
<tr>
<td>Not responsible at all</td>
<td>☐ 4</td>
</tr>
</tbody>
</table>

Demographic Profile (Circle the answer)

1. Gender?
   a. Male 1
   b. Female 2

2. How old are you?
   a. 18-34 (1)
   b. 35-44 (2)
   c. 45-54 (3)
   d. 55+ (4)

3. Your level of education?
   a. No schooling (1)
   b. Completed elementary school (2)
   c. Completed middle school (3)
   d. Completed high school (4)
   e. Diploma (5)
   f. Completed University (6)
      (Bachelors/Masters/PhD) (Please circle one)

4. How many people reside in your household?
   a. 1 (1)
   b. 2 (2)
   c. 3-4 (3)
   d. More than 5 (4)

5. What is your employment status?
   a. Full-time (1)
   b. Part-time (2)
   c. Not employed (3)
   d. Home maker (4)
   e. Retired (5)

6. What is your household characteristic?
   a. Single (1)
   b. Couple (husband and wife) (2)
   c. Family with children (0-16 years) (3)
   d. Family, all adults (17 year old and more) (4)

7. What is your household monthly income?
   a. < Rp.1 million - Rp. 2 million (1)
   b. Rp. 2.5 million Rupiah – Rp. 5 million (2)
   c. Rp. 5.5 million–Rp.10 million (3)
   d. Rp.10.5 million – Rp.20 million (4)
8. What is your total weekly budget for groceries/food purchases (7 days)?
   a. Less than 200,000 Rupiah (1)
   b. Between Rp.250,000-Rp.450,000 (2)
   c. Between Rp.500,000-Rp.700,000 (3)
   d. Between Rp.750,000-Rp.1,000,000 (4)
   e. More than Rp.1,000,000 (5)

9. What is the status of your home ownership?
   a. Homeowner (1)
   b. Renter (2)
   c. Sublet/Boarder (3)

10. Do you have a refrigerator?
    a. Yes (How many)?(1=1,2=2,3=3,N)
    b. No (0)

11. Do you employ a domestic helper?
    a. Yes (How many?) (1=1,2=2,3=3,N)
    b. No (0)

12. Who is responsible for groceries and food purchasing?
    a. Myself (1)
    b. My spouse: Husband/Wife (please circle) (2)
    c. My family members (3)
    d. Domestic helpers (4)
    e. Other________(5)

WASTE MANAGEMENT

13. Who picks up your waste?
    a. Waste collector from the municipality of Bogor (1)
    b. Private waste collector from the neighbourhood (2)
    c. Informal waste collector (3)
    d. No collector (4)
    e. Other____________(5)

14. How far is the temporary dump site from your residence?
    a. Less than 5 minutes of walking (1)
    b. Between 10 to 15 minutes of walking (2)
    c. More than 15 minutes walking (3)
    d. No temporary dumpsite (4)

15. Do you pay a waste collection fee?
    a. Yes (1)
    b. No (2)

16. How much is the waste collection fee per month?
    a. Do not pay (1)
    b. Rp. 5,000- Rp. 25,000 (2)
    c. Rp. 25,500- Rp. 45,000 (3)
    d. > Rp. 45,000 (4)
    e. Don’t know (5)

17. Do you know how to make compost?
    a. Yes (1)
    b. No (2)

18. Do you have a front yard or a backyard that you can use to compost?
    a. Yes (1)
    b. No (2)

19. If not, are there spaces in your neighbourhood that would allow you to compost your organic waste?
    a. Yes in my neighbourhood (1)
    b. No (2)
    c. I don’t know (3)
    d. Other____________(4)
20. **Which statement best represents your patterns of grocery shopping? Please checkmark ✔ only one answer**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>I buy almost all of the food during one big shop (shopping for basic/main foodstuffs - SEMBAKO)</td>
<td>1</td>
</tr>
<tr>
<td>I shop daily and usually buy enough only for that day</td>
<td>2</td>
</tr>
<tr>
<td>I do one main shop for basic foodstuffs and do daily shopping for additional food items</td>
<td>3</td>
</tr>
<tr>
<td>I order catering for the main meal and purchase some additional food items to add to the main meal.</td>
<td>4</td>
</tr>
</tbody>
</table>

21. **Which statement best represents your patterns of grocery shopping? Please checkmark ✔ only one answer**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>I do main shopping (main foodstuffs) more than once a week</td>
<td>1</td>
</tr>
<tr>
<td>I do main shopping (main foodstuffs) approximately once a week</td>
<td>2</td>
</tr>
<tr>
<td>I do main shopping (main foodstuffs) approximately every two weeks</td>
<td>3</td>
</tr>
<tr>
<td>I do main shopping (main foodstuffs) once a month</td>
<td>4</td>
</tr>
<tr>
<td>I only do daily shopping</td>
<td>5</td>
</tr>
</tbody>
</table>

22. **Which statement best represents your patterns of grocery shopping? Please checkmark ✔ all relevant answers**

<table>
<thead>
<tr>
<th>Purchase</th>
<th>Y=1 N=2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase food at wetmarkets</td>
<td></td>
</tr>
<tr>
<td>Purchase food at supermarkets</td>
<td></td>
</tr>
<tr>
<td>Purchase food at warung</td>
<td></td>
</tr>
<tr>
<td>Purchase food at mini-market</td>
<td></td>
</tr>
<tr>
<td>Purchase food at mobile vegetable vendors</td>
<td></td>
</tr>
<tr>
<td>Purchase catering service</td>
<td></td>
</tr>
<tr>
<td>Purchase food from street vendors</td>
<td></td>
</tr>
</tbody>
</table>

23. **How far in advance do you know/plan the food menu that will be prepared at home? Please checkmark ✔ only one answer**

<table>
<thead>
<tr>
<th>Menu Knowledge</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know all of the food menu that will be prepared/served for the following week</td>
<td>1</td>
</tr>
<tr>
<td>I know most of the food that will be prepared/served in my house for the following week</td>
<td>2</td>
</tr>
<tr>
<td>I know a few of the food menu that I will be serving in my house for the following week</td>
<td>3</td>
</tr>
<tr>
<td>I choose the menu daily</td>
<td>4</td>
</tr>
</tbody>
</table>

24. **Please try to remember the last time you shopped for food (whether at the supermarket, wetmarket, warung, vegetable vendor etc). Prior to shopping did you check if you still had the following food items in your house? Please checkmark ✔ only one choice per food type.**

<table>
<thead>
<tr>
<th>Food Type</th>
<th>Yes</th>
<th>No</th>
<th>Don’t remember</th>
<th>I don’t buy this food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>1☐</td>
<td>2☐</td>
<td>3☐</td>
<td>4☐</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Fruits (a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables (b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bread (c)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice (d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meat products/Proteins (e)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk (f)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convenience food/Ready Made Food (g)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canned foods and dried goods (h)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frozen food (i)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

25. **Please try to remember the last time you shopped for food (whether at the supermarket, wetmarket, warung, vegetable vendor etc). Did you do any of the following activities prior to shopping. Please checkmark ✔ all relevant answers**

<table>
<thead>
<tr>
<th>Activity</th>
<th>1☐</th>
<th>2☐</th>
<th>3☐</th>
<th>4☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>I create a grocery list prior to shopping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I memorize what I need to purchase when shopping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have a basic idea of what I need</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are no activities that reflects what I did</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I don’t know/Not sure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

26. **What is your opinion about the following statements? Please checkmark ✔ only one choice.**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wasting food is bad</td>
<td>4☐</td>
<td>3☐</td>
<td>2☐</td>
<td>1☐</td>
</tr>
<tr>
<td>People will think poorly of me if I waste food</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I never waste food</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My faith prohibits me from wasting food</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My culture prohibits me from wasting food</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

27. **Please try to remember the last time you shopped for food (whether at the supermarket, wetmarket, warung, vegetable vendor etc). Which activities reflect your actions while shopping. Please checkmark ✔ all relevant answers**

<table>
<thead>
<tr>
<th>Activity</th>
<th>1☐</th>
<th>2☐</th>
<th>3☐</th>
<th>4☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>I purchase only the food that is listed on my shopping list</td>
<td>Y=1</td>
<td>N=2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I purchase almost all of the food that is listed on my shopping list</td>
<td>Y=1</td>
<td>N=2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I purchase some of the food that is listed on my shopping list</td>
<td>Y=1</td>
<td>N=2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I purchase lots of additional/extra foods that are not in my shopping list</td>
<td>Y=1</td>
<td>N=2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I decide the food that I want spontaneously as I go shopping</td>
<td>Y=1</td>
<td>N=2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I usually buy the same food ingredients every week/day</td>
<td>Y=1</td>
<td>N=2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None of the statements are relevant</td>
<td>Y=1</td>
<td>N=2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t know/not sure</td>
<td>Y=1</td>
<td>N=2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
28. Please try to remember the last time you had leftover foods or made more food than is needed in your household, what happened to that food? Please checkmark ✔ all relevant answers.

<table>
<thead>
<tr>
<th>Option</th>
<th>Y=1</th>
<th>N=2</th>
</tr>
</thead>
<tbody>
<tr>
<td>I make it into new foods</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Did not use it and threw it away</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>It is kept/stored and has not been consumed</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>I serve it as it is</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>I gave it to someone else</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>I gave it to a pet/ animals</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Other: ____________________________________________________</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Not sure/ don’t remember</td>
<td>☐</td>
<td></td>
</tr>
</tbody>
</table>

29. The last time you cooked rice, at the end of the day was there any leftover rice that was not eaten? Please checkmark ✔ only one answer.

<table>
<thead>
<tr>
<th>Option</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>Not sure/ don’t remember</td>
<td></td>
<td>☐</td>
</tr>
</tbody>
</table>

30. The last time you cooked pasta/noodles, at the end of the day was there any leftover pasta/noodles that was not eaten? Please checkmark ✔ only one answer.

<table>
<thead>
<tr>
<th>Option</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>Not sure/ don’t remember</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>I don’t cook this food</td>
<td></td>
<td>☐</td>
</tr>
</tbody>
</table>

31. Over the past week, approximately how much of the following food did you throw out (in the waste bin, in the river, for animals, composted). Please checkmark ✔ only one answer for each type of food.

<table>
<thead>
<tr>
<th>Type of food</th>
<th>Significant amount</th>
<th>Quite a lot</th>
<th>Some</th>
<th>Little</th>
<th>Almost none</th>
<th>None</th>
<th>I don’t eat this food/ Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Fruits</td>
<td>☐ 6</td>
<td>☐ 5</td>
<td>☐ 4</td>
<td>☐ 3</td>
<td>☐ 2</td>
<td>☐ 1</td>
<td>☐ 7</td>
</tr>
<tr>
<td>B Vegetables/ Salad</td>
<td>☐ 6</td>
<td>☐ 5</td>
<td>☐ 4</td>
<td>☐ 3</td>
<td>☐ 2</td>
<td>☐ 1</td>
<td>☐ 7</td>
</tr>
<tr>
<td>C Bread and cookies</td>
<td>☐ 6</td>
<td>☐ 5</td>
<td>☐ 4</td>
<td>☐ 3</td>
<td>☐ 2</td>
<td>☐ 1</td>
<td>☐ 7</td>
</tr>
<tr>
<td>D Rice</td>
<td>☐ 6</td>
<td>☐ 5</td>
<td>☐ 4</td>
<td>☐ 3</td>
<td>☐ 2</td>
<td>☐ 1</td>
<td>☐ 7</td>
</tr>
<tr>
<td>E Protein/ Meat</td>
<td>☐ 6</td>
<td>☐ 5</td>
<td>☐ 4</td>
<td>☐ 3</td>
<td>☐ 2</td>
<td>☐ 1</td>
<td>☐ 7</td>
</tr>
<tr>
<td>F Milk and Juice</td>
<td>☐ 6</td>
<td>☐ 5</td>
<td>☐ 4</td>
<td>☐ 3</td>
<td>☐ 2</td>
<td>☐ 1</td>
<td>☐ 7</td>
</tr>
<tr>
<td>G Meal from the home</td>
<td>☐ 6</td>
<td>☐ 5</td>
<td>☐ 4</td>
<td>☐ 3</td>
<td>☐ 2</td>
<td>☐ 1</td>
<td>☐ 7</td>
</tr>
<tr>
<td>H Non-avoidable waste (example bone, banana peel, bone)</td>
<td>☐ 6</td>
<td>☐ 5</td>
<td>☐ 4</td>
<td>☐ 3</td>
<td>☐ 2</td>
<td>☐ 1</td>
<td>☐ 7</td>
</tr>
<tr>
<td>I Food that is cooked and over portioned and not served again</td>
<td>☐ 6</td>
<td>☐ 5</td>
<td>☐ 4</td>
<td>☐ 3</td>
<td>☐ 2</td>
<td>☐ 1</td>
<td>☐ 7</td>
</tr>
</tbody>
</table>
### J
Food that is leftover on the plate and no longer consumed

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>7</th>
</tr>
</thead>
</table>

### K
Food that is purchased but completely forgotten/ not consumed (example, bread, soy sauce, a jar of sambal)

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>7</th>
</tr>
</thead>
</table>

### L
Food that is purchased and only partially consumed (example, bread, soy sauce, a jar of sambal)

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>7</th>
</tr>
</thead>
</table>

### M
Food that went off/ rotten

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>7</th>
</tr>
</thead>
</table>

### N
Food that is expired

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>7</th>
</tr>
</thead>
</table>

### O
Food that does not suit my taste

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>7</th>
</tr>
</thead>
</table>

### P
Food that is disliked by the children

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>7</th>
</tr>
</thead>
</table>

### Q
Food that is not suitable to my religions

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>7</th>
</tr>
</thead>
</table>

### R
Food that I don’t like (bored off)

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>7</th>
</tr>
</thead>
</table>

### 32. If you estimate from all of your answers, on average, how much food is wasted in your household. Please checkmark ✔ only one answer

<table>
<thead>
<tr>
<th>A significant amount</th>
<th>1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Quite a lot</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Some</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>A little</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Almost none</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>None at all</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Not sure</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

### 33. How do you handle your food waste in the household. Please checkmark ✔ only one answer for each type of food waste management that you do.

<table>
<thead>
<tr>
<th>Management of food waste</th>
<th>Always</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>A I combine food waste with the rest of the household waste</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>B I dig a hole and bury the waste</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>C I throw on the cliff/ river/ ravine</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>D I separate food waste from other waste</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>E I compost food waste</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>F I give extra food/ leftover to pets, livestock/ stray animals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>G I burn the food waste</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Animals get at my food waste (make a mess)</td>
<td>☐ 1</td>
<td>☐ 2</td>
<td>☐ 3</td>
<td>☐ 4</td>
<td>☐ 5</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>I</td>
<td>I use pesticide/insect spray to deal with pests that get at my waste</td>
<td>☐ 1</td>
<td>☐ 2</td>
<td>☐ 3</td>
<td>☐ 4</td>
<td>☐ 5</td>
</tr>
</tbody>
</table>

Thank you!
Appendix E

Data Sources for Map


Map 2 - City of Bogor:

2. Personal website by Somma Radite: https://sites.google.com/site/sommaradite/portofolios/maps/BogorSHP.zip (last updated 2012)

U of T Data and Map Library files:

159 Indonesiacitiesover100K.zip CITIES SHAPEFILE
161 Indonesiadistricts2010.zip BOUNDARIES districts SHAPEFILE
162 Indonesiahighways.zip HIGHWAYS SHAPEFILE
165 Indonesiamajorroads.zip ROADS major SHAPEFILE
166 Indonesiaminorroads.zip ROADS minor SHAPEFILE
167 Indonesiaprovinces2010.zip BOUNDARIES provinces SHAPEFILE
Appendix F

Semi-Structured Interview Questions Guide for Households
(NOTE: these are guides and respondents have the flexibility to discuss matters not asked by the questions)

1. What is your employment, gender, age?
2. How long have lived here?
3. How many people reside in this house?
4. How old are you?
5. Salary range: a. Under 1 million to 2 million; b. 2.5-5 million; c. 5.5-10 million; 10.5-15 million; and 15.5 million above

Obtaining Food

1. Who is responsible for the purchasing of food in this house? Do you have a domestic helper and do they help to shop/ cook
2. Can you give me an example of the patterns of food purchasing/shopping?
3. Do other members of the family participate in the planning of what will be purchased, cooked?
4. Have you received food spontaneously/unplanned (elaborate?)
5. Where do you usually shop? How many stores/ type of retail do you frequent? Explain
6. What influences your decision to shop/obtain food at a certain place?
7. How many times do you shop for food?
8. Do you bring a list when you shop and do you follow it closely?
9. What method of transportation do you use to purchase food? (walk, public transport etc)
10. Do you plan your daily menu or is it spontaneous? Example?
11. Do you have a budget when you shop and do you feel that it’s important to stick to a budget?
12. Can you share an example of a typical breakfast, lunch and dinner menu?
13. Do you serve meat every day in your house? (including chicken, beef, fish etc)
14. Do you plan the food portion based on number of family members? Do you portion more?
15. Do you ever shop and have foods that go bad/ expired/ rotten? Can you share an example?
16. Do you pay attention to the expiry date?
17. Do you buy frozen foods (meatballs, frozen veggies etc)? How often?
18. Do you like to purchase ready-made foods/sauces?
19. If you buy foods outside/ take out, do you take that into account in the amount you cook at home? Have you ever experienced food going bad because of outside purchases? Elaborate
20. Does your work schedule influence shopping routines?
Cooking
21. Who is responsible for preparing food at home?
22. What is the level of participation for other members of the family in terms of cooking?
23. Do you purposefully avoid to not waste food when you cook?
24. When you cook, do you cook according to the portion/number of people?
25. Have you experienced overcooking? Elaborate?
26. Have you ever experienced foods turning bad/expired before you had an opportunity to cook? Elaborate
27. Do you have a fridge? What is generally in the fridge?
28. When you cook meat, do you choose whole meats (for example whole chicken) or do you prefer to buy meat already cut up and sold in Styrofoam trays?
29. Do you consume offals? (gizzard, intestine, liver etc)
30. Do you enjoy cooking?
31. Where did you learn how to cook?
32. If this happens, what are some of the reason that food get wasted when you cook?

Patterns of Eating
33. When eating, do you eat as a family? What are your patterns of family eating and has it changed in the past 10 years?
34. Do you have children at home?
35. Do you admonish your children to finish their food?
36. How do you admonish children to finish their food?
37. Have you ever used the crying rice story? (this question came up after participant observation)
38. How do you define the concept mubazir in relation to food?
39. What are your thoughts on food wasting?
40. Do you routinely have leftovers?
41. Do you and your family eat breakfast? Do you often have the same meal for breakfast as other meals or is it different? Elaborate?
42. What are your food preferences? Ethnic food? International food?
43. Do you often eat out? Do you eat fast food/processed foods?
44. How many times do you eat out in a month (approximately)
45. What are some of your reasons for choosing to eat out?
46. What do you usually eat in your family? (food types?/menu?)
47. When you eat out restaurants/cafes etc, do you often have leftovers?
48. Does your schedule impact the type of food that you eat, cook or purchase?
49. What are your thoughts on canned foods? Ready-made meals and frozen foods?
50. What are your thoughts on food packaging and especially plastic?
51. Have your food consumption patterns changed in the last ten years? Meat consumption?
52. Can you share your patterns of food consumption, shopping and cooking both past and present?
Management and Prevention

53. Do you aim to reduce food from being wasted? Can you provide examples?
54. When/ If food gets wasted in your households, what are some of the main reasons?
55. Does your faith and culture influence your behaviour regarding the management of food waste?
56. What do you do with leftover foods? Have you ever re-transformed foods?
57. Do you feel comfortable with sharing leftovers and or extra food to neighbours or other people?
58. In your experience, what is the biggest barrier to food waste reduction in your family? In your neighbourhood? Society in general?

Food Waste

59. What is the general/ typical content of your kitchen waste? Organic waste (not including yard waste)?
60. What types of food get wasted the most in your household?
61. Does food wasting and the amount of food waste in your household concern you?
62. How do you feel when you see food being wasted?
63. Do you source separate food waste?
64. Who is responsible for food waste management in your household?
65. Is animal infestation an issue in your household? Elaborate how do you prevent animals from the food waste?
66. Who collects your waste? Do you have a waste collectos?
67. Do you pay waste collection fees?
68. Do you know how to make compost?
69. Do you participate in composting?
70. In your estimate, what is the proportion of your food waste in comparison to other waste such as recyclables? (percentage?)
71. What in your estimate is the biggest barrier to segregation of organic waste from non-organic waste?
Copyright Acknowledgement

A version of my first empirical chapter, “(Re)framing the food waste narrative: The infrastructure of urban food consumption and food waste in Indonesia” is accepted in the journal, *Indonesia*. A version of my second empirical chapter “Gifting, Ridding and The ‘Everyday Mundane’: The Role of Class and Privilege in Food Waste Generation in Indonesia” is published in the journal *Local Environment* and a version of my third empirical chapter “Wasted Infrastructures: Urbanization, Distancing and Food Waste in Indonesia” is published in the journal *Built Environment*. 