

# Laboratory Report - Food Waste Data per Country

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## 1. Introduction

In 2022, 1.05 billion tonnes of food was wasted which amounts to 19% of food wasted for consumers all in retail, food service, and household sectors which has also been added for foods lost in the supply chain which amounts to 13%. In all of those sectors, Most of the food wasted comes from households which around 600 million tonnes, around 60% compared to the remaining two sectors. Annually, an average of 79 kg of food is wasted per household. Additionally, Hotter countries appear to have more food waste per capita in households, potentially due to increased consumption of fresh foods with substantial inedible parts and lack of robust cold chain [1]. From that, it can be concluded that because of the geographic location of South Eastern Asia, specifically the ASEAN nations being dominantly a tropical region, there are high expectations when it comes to food being wasted since because of the hotter climate in these regions there will be an increase in consumption and because of the data stating that most food waste comes from households, it can be correlated to this fact.

There is a presence of food wastage around the Philippines wherein households with larger meal portions, household members, and higher income level tend to waste more food. While one may think that higher consumption leads to lesser food waste, it is quite the opposite such that there is still a significant amount of food waste when there is a higher consumption due to excess leading to spoilage. Additionally, there is a pattern such that most food waste consists of rice, meat, and fish with those within the ages of 50-69 wasting more rice, smaller households wasting more vegetables, and larger households wasting more fish, meat, and poultry [2]. It can be seen that there the food waste are not being made randomly wherein they are simply being thrown plainly away commonly due to either spoilage or excess which also spoils but there are patterns of behaviors contributing to this fact such as those within a specific age group for example being seen to waste more on rice.

COUNTRY	FOOD WASTE PER CAPITA 2024	ANNUAL FOOD WASTE 2024	FOOD WASTE PER CAPITA 2021	ANNUAL FOOD WASTE 2021
 Philippines	25.50	3M	82.53	9.3M

**Figure 1.2. 3-Years Food Waste Comparison**



**Figure 1.3. The Overall Ranking, Score, and 10Y delta for the entire world**

When ranked globally, the Philippines despite having a large difference between 2021 to 2024, there is still a multitude of data [3]. When looking at the total statistics when it comes to waste generation in the Philippines. The Philippines ranks in the middle out of all countries with their waste management being around a 50% satisfactory management [4]. From the data, while it can be seen that there are significant improvements such that an estimate of ~67.74 decrease in overall food waste was seen as well as a ~69.13% decrease in food waste per capita meaning that not only is the Philippines having a very significant improvement in food waste management overall, the individual populations themselves are also having an improvement when it comes to managing their food waste. Still, despite this fact, food waste is still an ongoing issue that needs to be addressed since there is still a large presence of it.

## 2. Methods

In visualizing the dataset, the world was first visualized to serve as a starting foundation to understand the significance in moving forward with the provided data. It will provide a segway in visualizing both the ASEAN region and the Philippines if so as well as serve as a great reference point for comparison when needed to. Looking at both in terms of wastage per individual/capita will then be observed in order to visualize the pattern in which each population per individual handles their food waste and will then move forward in terms of tonnes for the overall food waste overall.

## 3. Visualization and Results

### Overall Waste Estimate kg/capita/year per Region

#### Top 5 - Region

Sub-Saharan Africa	6,979
Latin America and...	4,853
Western Asia	2,617
Southern Europe	1,845
South-eastern Asia	1,512

Figure 3.1. Top-5 Overall Waste Estimate (kg/capita/year) per Region

In the data visualized in Figure 3.1. It can be seen here that among the 21 subregions of the world, the South Eastern Asia region ranks 5th among all of them with a total of 1,512 kg/capita/year. For this fact, a further analysis on food wastage is highly recommended.

Retail Estimate tonnes/year per Region

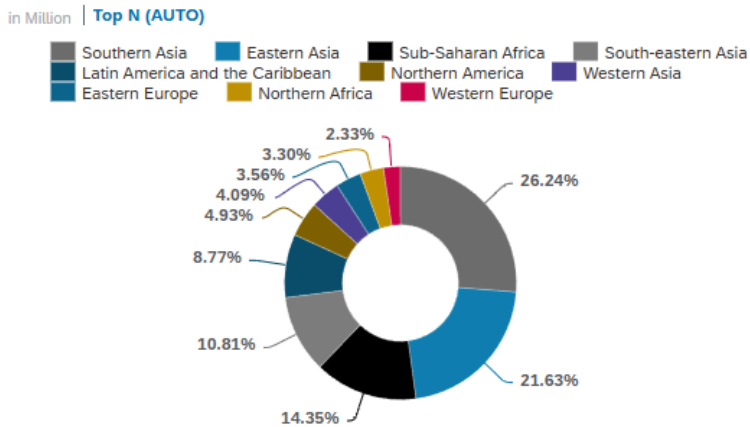


Figure 3.2. Retail Estimate per Region in tonnes/year

Household Estimate tonnes/year per Region

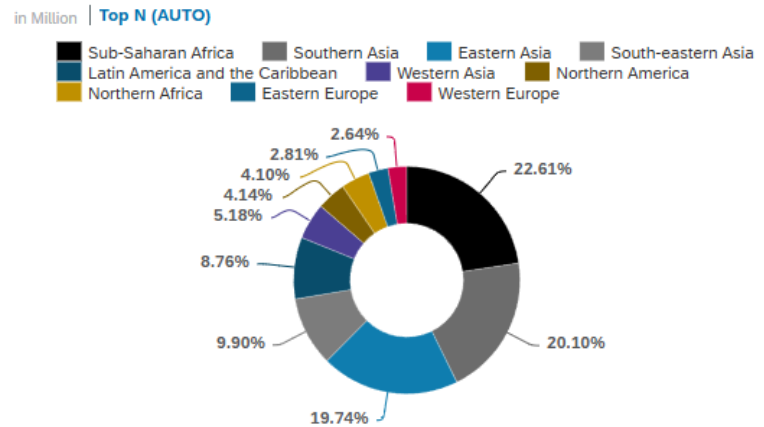


Figure 3.3. Household Estimate per Region in tonnes/year

Food Service Estimate tonnes/year per Region

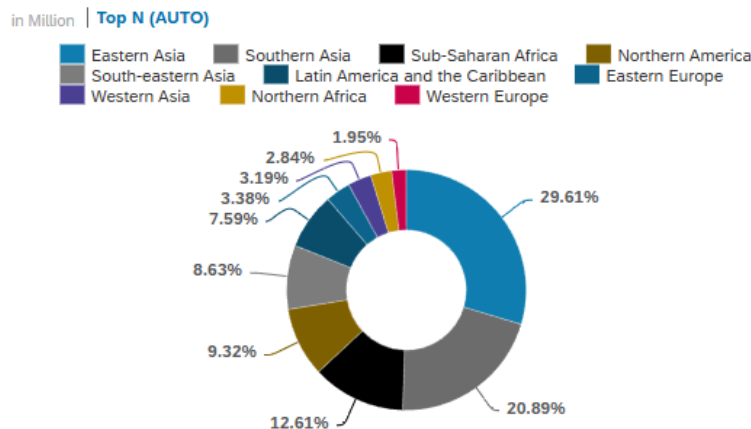


Figure 3.4. Food Service Estimate per Region in tonnes/year

Looking at the visualized graph in Figures Figure 3.2 to 3.4 it can be seen here that among all of the sub regions, South Eastern Asia ranks 4th in the All sectors except for the food service sector being 5th with 20 million tonnes/year of overall food waste.

### Sector Waste Estimates per ASEAN Country

1 Filter

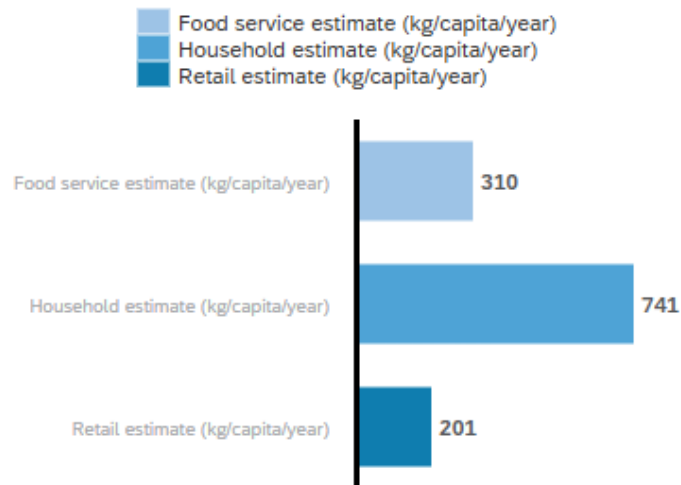


Figure 3.5. Waste Estimate per Sectors in kg/capita/year within ASEAN

### Sector Waste Estimates in the world

in Thousand

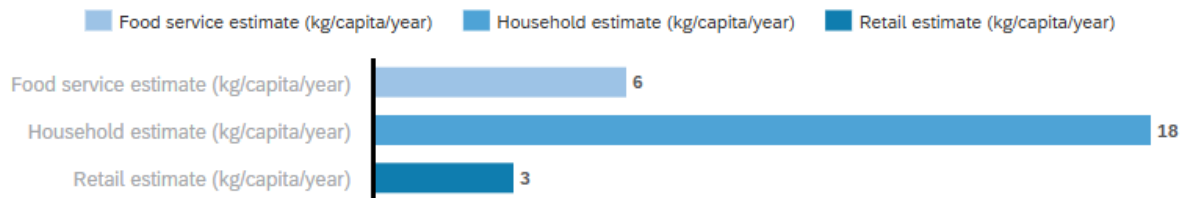


Figure 3.6. Waste Estimate per Sectors in kg/capita/year around the world

Looking at both Figures 3.5 and 3.6, it can be seen that among all of the measured sectors, the household contains a far greater number of estimates compared to the other two combined with ~741 kg/capita/year within ASEAN and 18,000 kg/capita/year in the entire world.

### Overall Waste Estimate kg/capita/year for ASEAN

1 Filter

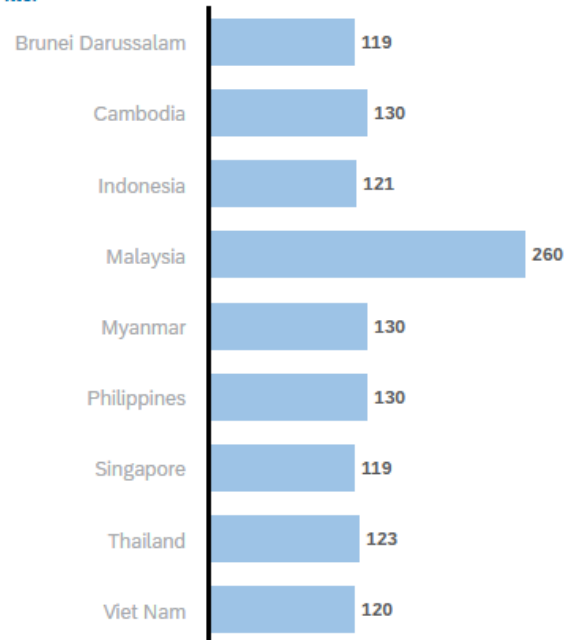


Figure 3.7. Top-5 Overall Waste Estimate (kg/capita/year) per ASEAN members

Delving deeper on the South-Eastern Region, specifically for the ASEAN countries, it can be seen in the visualization on Figure 3.7 that most of the countries are within the average of 139 kg/capita/year except for Malaysia with nearly double that.

### Estimate of Sectors within the ASEAN

1 Filter | Top 5 - All Dimensions (Food service estimate (kg/capita/year))

combined figures (kg/capita/year) Household estimate (kg/capita/year)  
Food service estimate (kg/capita/year) Retail estimate (kg/capita/year)

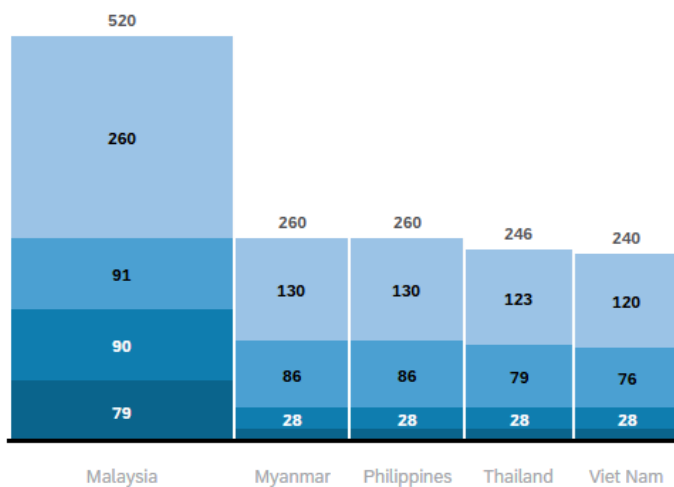


Figure 3.8. Top 5 Waste Estimate per Sectors in kg/capita/year within the ASEAN

### Estimate of Sectors in the Philippines

1 Filter | Top 5 - All Dimensions (Food service estimate (kg/capita/year))

combined figures (kg/capita/year) Household estimate (kg/capita/year)  
Food service estimate (kg/capita/year) Retail estimate (kg/capita/year)

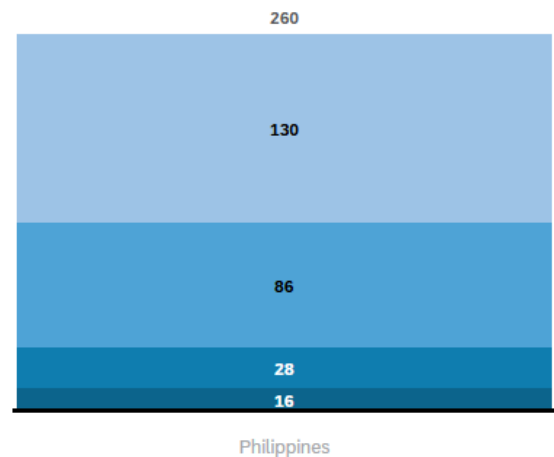


Figure 3.9. Waste Estimate per Sectors in kg/capita/year in Philippines

Looking further on the ASEAN nations, it can be seen that among the Top 5 in the overall waste estimates per sector, The Philippines ranks at 2nd having a tie with Myanmar in terms of overall estimates while Malaysia ranks 1st with nearly double compared to the remainders as can be seen in figures 3.8 and 3.9.

Estimate of Sectors within the ASEAN

1 Filter | Top 5 - Country (Retail estimate (tonnes/year))

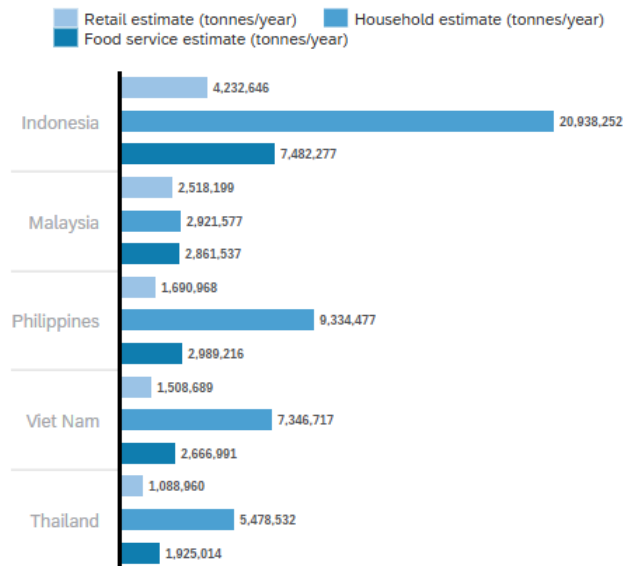


Figure 3.10. Top 5 Waste Estimate per Sectors in tonnes/year within the ASEAN

Estimate of Sectors within the Philippines

in Thousand | 1 Filter | Top 5 - Country (Retail estimate (tonnes/year))

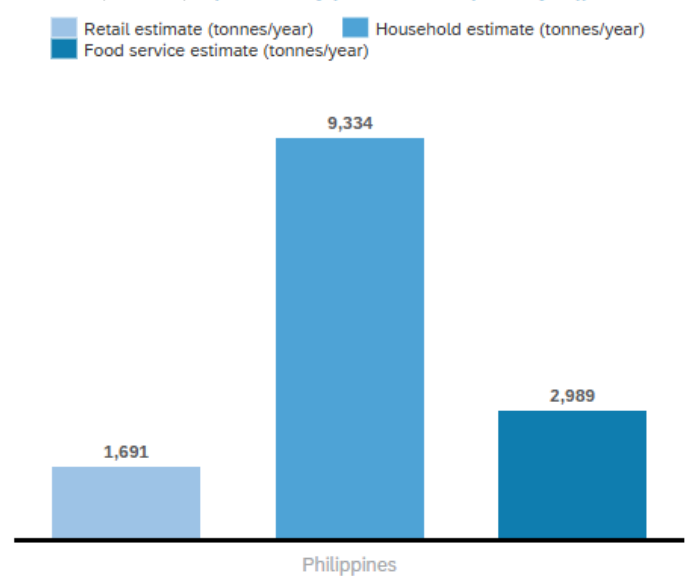


Figure 3.11. Waste Estimate per Sectors in tonnes/year in Philippines

Looking further on figures 3.10 and 3.11, while Malaysia has the most waste estimates in terms of kg per capita, they do not have the overall top in terms of total food waste among sectors in terms of overall waste in tonnes. Indonesia ranks at the top with the highest overall food waste per year in terms of tonnes while Philippines with the household sector making the lead is placing them at third.

## 4. Analysis

Looking further in the results gathered from the visualized results, it can be gathered from the information that in all 21 Subregions that were measured, the South Eastern Asia ranks among the top 5 which makes a studying further the issue highly recommended since it can be seen that it is indeed a prevalent issues which supports the idea of studying about this topic. Focusing further on the subregion, specifically the ASEAN nations, it can be seen here that based on the estimated wastage per sectors and overall in terms of kg/capita/year, the Malaysian nation ranks at the top of all the nations which makes studying further about that country highly valuable in extracting data both for further research and comparison in drawing conclusions regarding food waste and management. On the other hand, both Myanmar and the Philippines are in a tie for second place in all sectors which makes researching about Myanmar valuable as well due to the fact that they have the same amount of food waste despite having nearly double in terms of sqm of land. Lastly, analyzing and focusing further on the household food waste and management is all the more supported now since it can be seen in the results that the household sectors have far more than doubled compared to the combined values of the remaining two sectors per country which makes focusing on household food waste all the more worthwhile and important.

On the other hand, when looking at the data in terms of overall in tonnes/year instead of individually through kg/capita/year, it can be seen here that the data changes with the south eastern asia being more prevalent in those sectors ranking 4th overall with only  $\sim\frac{1}{3}$  difference when compared with those higher with the South Eastern Asia having  $\sim 12$  million in retail,  $\sim 20$  million in food service, and  $\sim 53$  million in household food waste estimate. Focusing on the household estimate due to its importance and significance being that it is among the most contributors in food waste, the Philippines contributes an estimated  $\sim 16.98\%$  of the total household food waste,  $\sim 15\%$  of the total food service estimate, and  $\sim 14.17\%$  of the total retail estimate for the entire ASEAN nations. The Philippines contributes nearly  $\frac{1}{4}$  in all sectors, food waste must be addressed and be solved significantly.

## 5. Conclusion

To conclude the results of the study, studying the topic of food waste is all the more justified further as can be seen in the consistent ranking of South Eastern Asia among the top five subregions in terms of food waste across all 21 measured areas. Malaysia ranking highest in estimated food waste per capita across all sectors make it a valuable case for analysis, particularly when compared to Myanmar and the Philippines, both tied in second place despite differences in land size and population. Most importantly, the household sector generates more than double the waste compared to the other two sectors combined, making it a critical area to focus on for future research and effective waste management strategies.

The data shows that even though food waste per capita may appear low, the total amount in tonnes per year remains very high. The Philippines contributes around 17% of household food waste, 15% of food service waste, and 14% of retail waste within the ASEAN region. These numbers show that the country has a significant impact on overall food waste as it contributes nearly  $\frac{1}{4}$  in all sectors.

## 6. Reference

- [1] United Nations Environment Programme. (2024, March). Food Waste Index Report 2024: Think Eat Save – Tracking Progress to Halve Global Food Waste.  
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- [4] Yale Center for Environmental Law & Policy. (2024). Waste generated per capita (WPC). Environmental Performance Index. <https://epi.yale.edu/measure/2024/WPC>
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