



Summer Course 2021
Department of Economics IPB University



IPB University
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South East Asia International Trade
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CERTIFICATE OF APPRECIATION

This Certificate is Awarded to:

Jannatul Adnin

as participant of E-Summer Course

“International Trade in Agriculture: Challenges and Prospects during Covid-19 Pandemic”

Bogor, 2 August 2021



Prof. Dr. Ir Nunung Nuryartono, M.Si

Dean of Faculty of Economics and Management
IPB University



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Certificate of Credit Earning Activities

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Jannatul Adnin

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IPB301: Summer Course
held from **12/07/2021** to **29/07/2021**

in

Summer Course 2021

“International Trade in Agriculture: Challenges and Prospects During Covid-19 Pandemic”

This course is organized by the study program of
Development Economics,
Faculty of Economics and Management,
IPB University

Dean of Faculty of Economics and Management

Prof. Dr. Ir. R. Nunung Nuryartono, M.Si.

Summer Course Coordinator

Fahmi Salam Ahmad, S.Stat., M.Si.

Summer Course 2021

“International Trade in Agriculture: Challenges and Prospects During Covid-19 Pandemic”

Jannatul Adnin
Muhammadiyah University of Parepare

The student is entitled to earn credits in Indonesian Credit System for having invested approximately 135 hours in this course. Equal to

3 credits

with the academic grade of

A

The course facilitates and covers the following packages with corresponding activities:

1. International Trade, Trade and Investment, Trade and Development during Covid-19 Pandemic
2. Agricultural Trade and Global Trade Agreement Commitment Post Pandemic
3. Food Resilience in Indonesia Complementary Approaches to Large-Scale Food Estates
4. Digital Trade in Agriculture
5. Lesson learned from Indonesia, Malaysia, Vietnam, Japan, and Australia
6. The role of World Trade Organization

Learning hours (LH) summary:

Activities	Unit	LH	Total LH
Lectures	12	2	24
Daily assignment: individual review	6	6	36
Paper preparation and coaching	10	7	70
Seminar: presentation of paper	1	5	5
Total			135

Dean of Faculty of Economics and Management



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Food Waste: Take It or Leave It

(Study case in Indonesia and Philippines)

*Fiannie Kamilia Yasmin, Jannatul Adnin, Nurdiawati Devayana, Ribka Natalia Tambunan, Winklhel Mon B. Francisco **

** IPB University, Muhammadiyah University of Pare-Pare, IPB University, IPB University, Iloilo Science and Technology University*

fiannie_23@apps.ipb.ac.id, jannatuladn04@gmail.com, bpsnurdiawati@apps.ipb.ac.id, ribkantambunan@apps.ipb.ac.id, franciscowinklhel@gmail.com

Key Issue:

Food Waste

- It is not only ethical dilemma, but also economic, and environmental problem.
- It can be produced by household waste, industrial waste, and agricultural waste.

Abstract

With a fairly large population, food waste has become a problem in Indonesia and the Philippines. With the various losses that result, proper handling of food waste is needed. Therefore, this study was conducted to see what factors influence the behavior of Indonesian and Filipino people towards food waste. By using descriptive qualitative analysis, it is hoped that a general picture will be obtained regarding differences

in the behavior of people in Indonesia and the Philippines towards food waste. Indonesian people tend to leave food waste while poor people in the Philippines tend to take food waste. In the case of Indonesia, the things that cause food waste are mindset problems in food availability, cultural problems, and lack of knowledge about food waste management. The things that cause food waste in the Philippines are poverty due to low education, low-income workers, and acceptance of pagpag culture. Cooperation between the community and the government is needed to reduce food waste because no food is wasted if people take the time to plan their food consumption. It will be more useful if there are further studies undertaken with better measures since this paper is only descriptive research.

Keyword : Food waste, Poverty, Pagpag

Introduction

Food is an essential ingredient that humans need to survive and grow as well as air, clothing, and shelter. People owe a lot to farmers and food producers, therefore food should be consumed rather than thrown away. For example, food should be eaten but is instead thrown away because it has expired. Despite many people are starving and malnourished, other humans produce leftovers.

In addition, the food industries face challenges to maintain food supply chain continuity so they must adapt quickly with greater pressures. This is because people sometimes buy a lot of food without thinking about when or how they will use it for consumption. Then they forget to use it and end up being food waste. In the agricultural



sector, many agricultural products become food waste due to rotting during harvest, storage, or shipping. This is clearly a disadvantage from an economic point of view.

Recently, there have been many environmental issues related to waste. According to the Food and Agriculture Organization (FAO, 2008) that a third of the food produced does not end up on our plates but is thrown in the trash. When food is dumped on the ground, it decomposes and produces methane which has great potential for global warming. In addition, carbon pollution generated by transporting food waste is also a problem. These gases are carried into the atmosphere and have the potential to damage the ozone layer which functions to maintain temperature stability on earth. If temperature stability is disturbed, global warming and sea-level rise will occur due to melting ice on earth.

In Indonesia, it is estimated by The Economist Intelligent Unit (Khusnulkhatimah, 2020) that each person can produce up to 300 kilograms of food waste per year. Then about 13 million tons of food is wasted every year. This amount of wasted food is equal to the consumption that can be met for the hunger rate in Indonesia which reaches 28 million people. Ironically, in Indonesia's trade, it was recorded that in 2016, Indonesia imported 2,479 million USD food waste, increasing to 2,910.8 million USD in 2020 (Ministry of Trade Republic of Indonesia, 2021).

Based on the Law of the Republic of Indonesia Number 18 of 2008 concerning Waste Management, waste planning is the first step in implementing the development of the waste sector as the basis for short, medium, and long-term management. Meanwhile, waste reduction can be done using the 3R method (Reuse, Reduce, and Recycle). But unfortunately, the implementation is still far from expectations, so it is not surprising if it is easy to find mountains of food waste on the roadside in Indonesia.

Meanwhile, in the Philippines, one family throws away 1,676 kilos of rice each year, according to the Philippine Statistical Authority (Cruz, 2020). The amount of food waste reached 38.507 million kg or P1.617 billion worth. Ironically, poor people in the urban slums of the Philippines use food waste as raw material for their food. They recook it into food known as Pagpag.

The absence of a food waste management system in the Philippines is one of the causes of the severe condition of food waste in the Philippines. In 2020, the Philippines considered adopting the House of Representatives Bill 3370, or the Food Waste

Reduction Bill (Cruz, 2020). This is done to minimize food waste through contribution and recycling of waste.

Food waste has serious economic, environmental and ethical consequences. The problem of food waste in Indonesia and the Philippines is fairly complex. Food waste should be thrown away but Indonesia imports it, while the Philippines uses it as food. However, there is no study done on food waste comparison between Indonesia and the Philippines. Therefore, this research was conducted to answer the question what factors contribute to the behavior (leave it or take it) of Indonesians and Filipinos towards food waste?

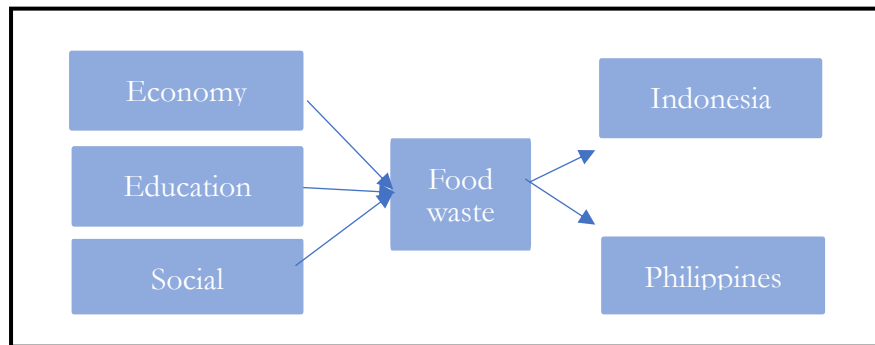


Figure 1. Conceptual framework

Literatur review

According to FAO (2008), Food Security is a situation where households have access to food for their family members physically and economically, and it is in a condition where they are not at risk. However, if a country has difficulty in accessing food, then the country is classified as a country that has food instability in the food systems. There are two major food system problems called food poverty and food waste. Based on FUSIONS (2016), food waste is all inedible portions of food, that are removed from the food supply chain for retrieval or disposal (including compost, unharvested crops, anaerobic digestion, bioenergy production, co-generation, incineration, disposal to sewers, landfill or dumped into the sea).

Food that is wasted and becomes trash causes losses in several aspects of human life. Wasted food will have implications for the resources used in the food production process such as electricity, fuel, and labour (Kariyasa & Suryana, 2016). Indonesia is one of the countries that contributes the most waste in the world. This is because Indonesian have a habit of buying food based on their mood even though they're not hungry. That is why there is a lot of leftover food and expired food because they store too long and lack

the knowledge to treat the leftover food. In addition, the level of food wastage tends to be higher due to consumer and retailer behaviour, overproduction, and high-quality demand by the consumers (Kariyasa & Suryana, 2012).

Kariyasa and Suryana (2012) said that the level of food wastage, especially at consumption is very high, even in developed countries it has reached 40% of the total loss and food wastage. Without realizing that this phenomenon will cause the deteriorating food security of the community. In the case of Indonesia, there are things that cause waste of food consumption and tend to increase. These are the problem of mindset about food availability, cultural issues, and lack of awareness of the importance of losing the economic value of food.

Prasetyo and Ratna (2020) analyzed the factors that affected food waste in lecturers of the Indonesian language. The study was conducted by comparing the behaviour of respondents. As a result, respondents believe that wasted food can be reprocessed into fertilizers, so they immediately throw their food waste into the trash. In addition, it's known that the control of respondents' beliefs that are very prominent regarding food waste behaviour is the condition of eating patterns, nutritional content, and religious beliefs.

There are some import commodities that continue to grow such as food waste even though the average for other commodities declines. According to the Ministry of Trade Republic of Indonesia (2021), Indonesia has imported residues and waste from the food industries for animal feed and input for fertilizer industries from several countries such as Brazil, Argentina, the USA, China, Korea, Thailand, Singapore, New Zealand, and France. In 2020, the main commodities that are being imported are oilcake and other solid residues, whether ground or in the form of pellets, resulting from the extraction of soybean oil, vegetable material, vegetable waste, waste of sugar manufacture, wine lees, and many more. Imports of food waste, which is dominated by the extraction of soybean oil from Argentina, are used as a mixture for making animal feed, especially for poultry. So far, Indonesia is considered unable to meet the needs of feed from soybean production that is consumed and used as food ingredients such as tofu and tempeh. For this reason, the faucet for importing food waste continues to be opened, even during a pandemic. The impact of these imports for The Indonesian people is the low price of animal feed due to

the abundance of animal feed in the market, supporting food security such as the production of poultry meat, eggs, and other livestock products.

On the other hand, the poor people in the Philippines buy food waste that comes from fast-food restaurants then recook it as pagpag. The urban poor of Metro Manila is socially accepting pagpag culture because of its affordability and availability. However, it denies the right of the poor to choose healthy and clean food. Their socio-economic profile greatly influenced their decision to eat pagpag (Ladicola, 2013). Extreme poverty has pushed them to live on what is cheap and available.

People are poor in the Philippines because their income is low, not because they don't have a job. Having a job provides no way out of poverty in the Philippines. Workers employed in low-productivity jobs have a higher risk of poverty than those who are unemployed. This is because the unemployed are often well-educated people from better-off families, who look for jobs that meet their passion and educational background. Unemployment just implies the underutilization of the well-educated labour force. The prevalence of low-productivity jobs is a major cause of poverty in the Philippines (Jan Rutkowski, 2015).

Methods

This research uses a qualitative descriptive approach. Descriptive analysis is a statistical analysis that describes data into clearer and easier to understand information using the help of analytical tools related to research. The study's analysis tools are tables and graphs. In this analysis, there are no hypotheses or statistical tests so that the conclusions are only based on visualization of the numbers presented. In this study, descriptive analysis was carried out to find out the general description of factors that influenced people's behavior (leave it or take it) toward food waste in Indonesia and the Philippines. The study used secondary data from the World Bank, ASEANstats, and UNEP. Secondary data were obtained are presented in Table 1.

Table 1. Data Types and Sources

Variable	Unit	Source
Population density	People per km ²	World Bank
Urban population	Percentage	World Bank
Population living in slums	Percentage	World Bank
Households' final consumption expenditure	Percentage	World Bank
Food production	Index	World Bank

Crop production	Index	World Bank
Livestock production	Index	World Bank
Fertilizer consumption	Kg	World Bank
Food exports	Percentage	World Bank
Food imports	Percentage	World Bank
Prevalence of moderate or severe food insecurity	Percentage	World Bank
Prevalence of severe food insecurity	Percentage	World Bank
School enrollment, secondary	Percentage	World Bank
School enrollment, tertiary	Percentage	World Bank
Individuals using the Internet	Percentage	World Bank
Poverty headcount ratio	Percentage	World Bank
Gross Domestic Product	USD	ASEANstats
Inflation rate	Percentage	ASEANstats
Unemployment with advanced education	Percentage	World Bank
Unemployment with basic education	Percentage	World Bank
Unemployment with intermediate education	Percentage	World Bank
Household food waste estimate	Kg/capita/year	UNEP

Result and Discussions

Indonesia and the Philippines are neighboring countries that are members of ASEAN. Indonesia is the country with the highest population in ASEAN, while the Philippines is in second place (ASEANstats 2018). With a large population, food waste is an issue in that both countries. From Table 2, almost half of the urban population in the Philippines lives in slum areas, and this is reinforced by the fact that the population density of the Philippines is twice that of Indonesia. Furthermore, the Philippines' food waste estimate is higher than Indonesia's.

Table 2. Demographics and food waste in Indonesia and the Philippines, 2018

Country	Population density	Urban population (%)	Population living in slums (%)	Household food waste estimate (kg/capita/year)
Indonesia	143	55.33	30.60	77
Philippines	358	46.91	42.90	86

Source: World Bank, UNEP

Based on Figure 2, food insecurity in the Philippines is a big problem because more than half of the population is in the prevalence of moderate or severe food insecurity in 2018. Even the percentage of the prevalence of severe food insecurity is higher than the prevalence of moderate or severe food insecurity in Indonesia. It is even worse

because both the prevalence of moderate or severe food insecurity and the prevalence of severe food insecurity in the Philippines show an upward trend, while in Indonesia they show a downward trend.

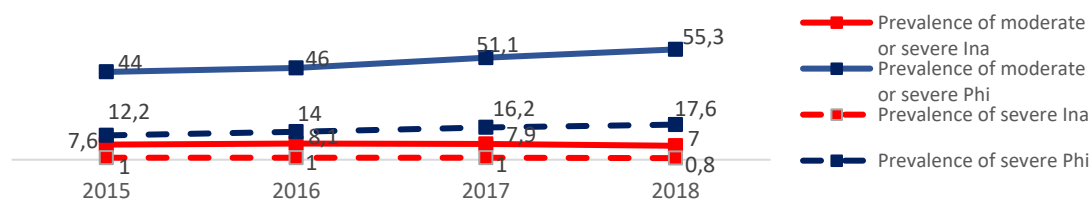


Figure 2. Prevalence of food insecurity in Indonesia and the Philippines, 2015 - 2018

Source: World Bank

Food waste cannot be separated from supply and demand for food. In Table 3, from the demand side, households' consumption tends to be stable in Indonesia and the Philippines. However, from the supply side, both Indonesia and the Philippines show an increasing trend from the food production index, crop production index, and livestock production index. That is why fertilizer consumption is also an upward trend. Interestingly, the percentage of Indonesian food exports is higher than its food imports, but the percentage of Philippines food exports is lower than its food imports.

Table 3. Food availability in Indonesia and the Philippines, 2015 - 2018

Variables	Indonesia				Philippines			
	2015	2016	2017	2018	2015	2016	2017	2018
Food production index	99.79	103.79	107.01	108.90	100.24	99.68	104.24	104.48
Crop production index	99.85	102.98	106.96	109.06	100.23	97.84	103.59	102.83
Livestock production index	99.15	106.76	108.30	109.49	100.12	104.15	105.20	108.46
Fertilizer consumption	228.70	216.04	221.48	236.44	139.42	169.63	212.60	169.00
Food exports (%)	21.45	22.28	23.18	20.45	7.73	8.36	9.31	8.66
Food imports (%)	9.97	11.61	11.85	10.21	11.72	11.62	11.07	11.19
Households' final consumption (%)	57.45	57.83	57.28	56.98	72.47	72.55	72.18	72.54

Source: World Bank

Education also has a role in food waste. From table 4, Indonesia and the Philippines have the same trend, which is less than half of the population who continue in tertiary from secondary education. Besides, it is only about 40 percent of the population uses the internet.

Table 4. Education in Indonesia and the Philippines, 2018

Country	School enrollment, secondary (% gross)	School enrollment, tertiary (% gross)	Using the internet (%)
Indonesia	88.91	36.31	39.90
Philippines	84.05	35.48	43.03

Source: World Bank

The problem of food waste won't be separated from the economic side. In developing countries, such as the Philippines and Indonesia, food tends to be wasted in the production process. Food waste is largely due to economic and welfare problems such as poverty, lack of infrastructure and technical skills as well as food production and post-harvest processing (UNEP, 2021).

From Table 5, poverty rate in Indonesia and the Philippines show a downward trend from 2015 to 2018. This is supported by the increase in GDP in both countries. In 2018, The Philippines experienced quite high inflation, while the inflation rate in Indonesia was observed to be stable.

Table 5. The economy in Indonesia and the Philippines, 2015 - 2018

Variables	Indonesia				Philippines			
	2015	2016	2017	2018	2015	2016	2017	2018
Poverty headcount ratio (%)	11.20	10.90	10.60	9.80	23.5	-	-	16.7
Gross Domestic Product (USD)	855,020	930,836	1,014,003	1,039,929	306,213	318,375	328,782	344,893
Inflation rate (%)	3.4	3.0	3.6	3.1	1.5	2.6	3.3	6.6

Source: World Bank

Problems with high population growth rates that are not evenly distributed, resulting in competition for the job opportunities, as shown in Table 6. Unemployment rates in Indonesia and the Philippines show a downward trend at all levels of education. Interestingly in these two countries, the unemployment rate is high at the higher level of education, namely the intermediate and advanced education, while the unemployment rate with basic education is the lowest.

Table 6. Labor in Indonesia and the Philippines, 2015 - 2016

Variables	Indonesia		Philippines	
	2015	2016	2015	2016
Unemployment with advanced education (%)	5.44	4.95	8.46	7.51
Unemployment with basic education (%)	3.09	3.07	4.74	4.26
Unemployment with intermediate education (%)	8.48	7.54	10.28	9.03

Source: World Bank

4.2 Discussions

In the Philippines' case, according to the World Wildlife Fund (2020), an estimated 2,175 tons of food scraps in Metro Manila are thrown in the garbage every day. More than 13 million Filipinos can't afford three square meals a day. With almost half of the population living in slum areas, it is no wonder that residents in slum areas of the Philippines **take** food waste to be pagpag. Eating or selling pagpag is a way of life in the slums. In addition, this is reinforced by the high prevalence of food insecurity in the Philippines. As revealed by Ladicola (2013), they cannot choose healthy and clean food and end up eating pagpag which is leftover food from the trash. Coupled with the fact that the Philippines has a high dependence on other countries to supply its food products.

In the case of food waste in Indonesia, Indonesian people are still less concerned with this issue, it was seen from the high level of household food waste estimate for Indonesia. Indonesians **leave** their food waste. This is in line with Kariyasa and Suryana (2012) result study. This is because the increased performance of agriculture in Indonesia gives the impression that food insecurity is not a big problem in Indonesia so that people do not feel guilty about their food waste. They can easily find various food products in the markets, although sometimes the price is higher. Next, the public has also become more critical of the quality of food commodities so that food products that are considered not to pass the quality check end up becoming food waste. This is as explained by Kariyasa and Suryana (2012). Ironically, with the amount of food waste in Indonesia, food industry waste is the second-highest imported agricultural commodity (Ministry of Trade Republic of Indonesia). Indonesians **take** it as input for fertilizer industries and animal feed.

Moreover, the lack of education of the Indonesian people regarding food waste management, which can be approached by the low school enrollment of tertiary education from secondary, contributes to food waste in Indonesia. Indonesians **leave** their food waste. As stated by Kariyasa and Suryana (2012) in their research that Indonesian people buy too much food even though they do not know how to manage the leftover food and tend to store food for too long, so it rots and is eventually thrown away.

Culture and eating habits also affect food waste in Indonesia, one of them through the internet. The use of the internet which is quite high today makes information spread very quickly through social media. Therefore, there is a trend of food delivery services that provide many discounts and tempting variations of food so that people go crazy buying food, although they are not hungry then some of it ends up in trash as food waste. For this reason, Indonesians **leave** their food waste. This is in line with the results of research by Prasetyo and Ratna (2020), and Kariyasa and Suryana (2012).

Meanwhile, poor education and lack of skills are the main factors behind job poverty in the Philippines. Workers with less than secondary education face substantially worse labor market prospects than those who completed high school. Their earnings are significantly lower, and the risk of poverty is much higher. With this low income, they are forced to **take** food waste and eat them. They finally accepted pagpag culture. This shows a clear policy implication that investing in access to quality education is the most effective way to combat extreme poverty that can encourage them to eat pagpag, as stated by Ladicola (2013).

Most people work in the Philippines, and few are unemployed. Economic growth creates jobs, but hardly improves their quality. And the condition is exacerbated by the high inflation in the Philippines. So, like it or not, some Filipinos **take** food waste and make it as a food ingredient. This is in line with the research results of Jan Rutkowski (2015), that having a job does not provide a way out of poverty. Workers employed in low-productivity jobs have a higher risk of poverty than those who are unemployed.

Conclusion and Implication

Comparison of the behavior of the Indonesian population with the Filipino population towards food waste has a fairly large difference. Indonesia is the country with the largest population in ASEAN, while the Philippines is in second place, with a large population, food waste is an issue in both countries. In the case of Indonesia, the things

that cause food waste are mindset problems in food availability, cultural problems, and lack of knowledge about food waste management. The things that cause food waste in the Philippines are poverty due to low education, low-income workers, and acceptance of pagpag culture.

In Indonesia, people usually don't know how to manage leftovers and tend to keep food for too long and then throw it away. Meanwhile, in the Philippines, the poorest poor people eat pagpag which is leftover food from the trash.

One way to tackle the food waste problem is to align the private sector and government efforts towards the fight against hunger, and cutting current household food waste, for example, would go a long way in solving the food waste problem. The logic is simple, no food is wasted if people take the time to plan their food consumption. Aside from that it will be more useful if there are further studies undertaken with better measures since this paper is only descriptive research.

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