

REPORT ON
CONSUMER INFORMATION
FOR SUSTAINABLE CONSUMPTION AND PRODUCTION
IN FOOD SUPPLY CHAIN IN BANGKOK



Submit to United Nations Environment Program (Thailand)

Prepared by Thailand Environment Institute

September 2021

CONSUMER INFORMATION
FOR SUSTAINABLE CONSUMPTION AND PRODUCTION
IN FOOD SUPPLY CHAIN IN BANGKOK

CONTENTS

1. OVERVIEW	3
1.1 General Information of Bangkok	3
1.2 Food Waste Situation in Bangkok	5
1.3 Policy Analysis and Stakeholder Mapping	8
2. A STUDY ON THE USE OF TECHNOLOGY ON FOOD WASTE MANAGEMENT	14
2.1 A survey on adoption of technology for management of food waste in Bangkok	14
2.2 Case study on technological solutions	15
2.3 Application of economic incentives and behavioral interventions	21
2.4 Opportunity analysis to adopt technology for food waste management	22
3. POLICY RECOMMENDATIONS ON FOOD WASTE MANAGEMENT IN BANGKOK	26
ANNEX Roles of the key stakeholders on food waste management in Bangkok	29

CONSUMER INFORMATION FOR SUSTAINABLE CONSUMPTION AND PRODUCTION IN FOOD SUPPLY CHAIN IN BANGKOK

Sustainable Development Goals (SDGs) Goal 12 - Ensuring sustainable production and consumption patterns which was announced by the United Nations in 2015. The third target under this goal (Target 12.3) calls for cutting in half per capita global food waste at the retail and consumer level, and reducing food losses along production and supply chains (including post-harvest losses) by 2030, and to enable member States to reduce food loss and food waste through systematic management. It has a Global Food Loss Index for measuring losses over a range of agricultural production from post-harvest to retail and the per capita food waste (kg/year) index, which measures food waste in the range from retail to consumption.

As the most of the food waste is a problem for urban society, which is a society of consumption rather than production. There is little space which is a barrier to disposing of food waste. The complexity of such society and infrastructure poses a challenge in managing food waste in metropolitan areas around the world. Therefore, this study which conducted based on the Global initiative on Green Technology on Food Waste launched in 2020 to the large urban contexts. Bangkok Thailand is selected as one of five studies area for appropriate use of technology with an intention that the experiences and lessons of the study can be applied to other urban areas.

1. OVERVIEW

This section on the food supply chain in Bangkok indicate situation analysis, identification of drivers or root causes, and provision of information on stakeholders, existing policies and measures, and lessons learnt. It also presents a stakeholder mapping and local policy analysis.

1.1 General Information of Bangkok

Bangkok is the capital of Thailand, governed by a special local government, occupying about 1,568 square kilometers and covering large areas. It therefore, was divided into 50 districts in order to expand administrative services throughout all areas which Bangkok Metropolitan Administration (BMA) is actively responsible for.

At the end of 2020, the registered Bangkok population is about 5.59 million people. Regarding the non-registered it was presented by Department of City Planning, BMA research found it was not less than 5 million people. Therefore, total number of Bangkok population is about 10.59 million people, with the population density of 6,754 people per square kilometer. Land use in Bangkok is dense in the center of Bangkok and expanding around. There is a limited cultivated area, which remains as a rice fields, vegetable plots, ornamental flowers, etc. Therefore, it cannot support for Bangkok people consumption. Consequently, Bangkok people are relying on food from other sources outside the area.

The food supply chain in Bangkok mobilized through wholesale and retail mechanism which has the food entrepreneurs scattered throughout the area. While there are about 60 large retail-wholesale in

Bangkok and spread in neighboring provinces distribute along the main roads that leave Bangkok to other provinces and regions.

The case of modern trade in Bangkok with a large number of branches, including Top Supermarket, Macro, Lotus, 7-eleven, which has grown from sales of both fresh food and dry food. They have developed infrastructure to support the development of business practices lifestyle and provide customers with convenient access to products as well as growing from ready-to-eat and chilled products with a tendency to increase in number and be able to grow well from consumer behavior that likes convenience. While the trend of expanding branches of large retailers such as hypermarkets has begun to slow down and turned to focus on expanding small branches near communities to reach more target customers, such as Max Value and Villa Market. But there are customers in the group of consumers with high purchasing power, focusing on building a good image and select high quality products for sale. Currently, most of wholesales and retrials have being adapting an online service to meet the needs of customers.

Fresh market is another form of food distribution sources that is important for Bangkok people. In general, the fresh market is regulated by many agencies. Currently, there are approximately 485 markets, 95 percent of which are privately owned markets, and 2.5 percent are market offices, BMA, the rest is the market of other agencies. The various markets are supervised by the Department of Health, Department of Internal Trade, and Market Organization, Mistry of Interior. These organizations promote a good hygiene and environment for the markets but no food waste management criteria.

According to the study review for scoping this report, it found that the framework for food waste management capable to be applied to food consumption chain analysis of Bangkok will be divided into 3 parts, consisting of;

- 1) **Food distribution** – hypermarket, supermarket, convenient store, and market; mainly due to fresh food and short-lived products that deteriorated, damaged products from customer’s behavior, products with the shapes are not according to the criteria, and nearly expiration date which are discarded. In addition, there are leftover products due to market competition and poor economic conditions.
- 2) **Food services** - hotels, restaurant, food court, cafeteria, catering service; mostly are scraps from the food preparation in the kitchen and are discarded, as well as leftovers from the party and leftover food on the customer's plates.
- 3) **Households**; it is found that general residence in horizontal style has a higher rate of waste per person per day than those in high-rise buildings or in a verticle style, because of they are bigger family and more frequently cooking. In addition, most of the food wastes found in the kitchen, expired food, deteriorated food, and the leftover food on the plate, respectively.

1.2 Food Waste Situation in Bangkok

The amount of solid waste generated in Bangkok tends to increase continuously. The highest volume in 2018 was 3.91 million tons or 10,705 tons per day, accounting for 17% of the total waste generated in the country. Then, the amount of waste in Bangkok was reduced in 2019 and 2020 to 3.85 million tons and 3.48 million tons, respectively, due to the COVID-19 pandemic situation with the use of lockdown measures and many businesses were temporarily closed. A number of people returned to their homeland and there were no foreign tourists visiting Thailand for a period longer than a year. However, during the COVID-19 pandemic, the non-recyclable plastic waste or plastic not worth recycling, as well as non-recyclable paper have been increased. This has the linked to online food ordering behavior with a large use of plastic and paper packaging. When those packages are contaminated with food and grease, there is a difficult process to recycle, therefore they are being discarded together with general waste.

Regarding food waste that occurred in Bangkok during the past 10 years, the proportion was in the range of 42-52% of the waste generated (as shown in the picture), with the trend of food waste changing in line with the change of total amount of food produced in Bangkok. The amount also declined during 2019 and 2020. It is not yet clear where most of the food waste came from because there is no clear data collection system.

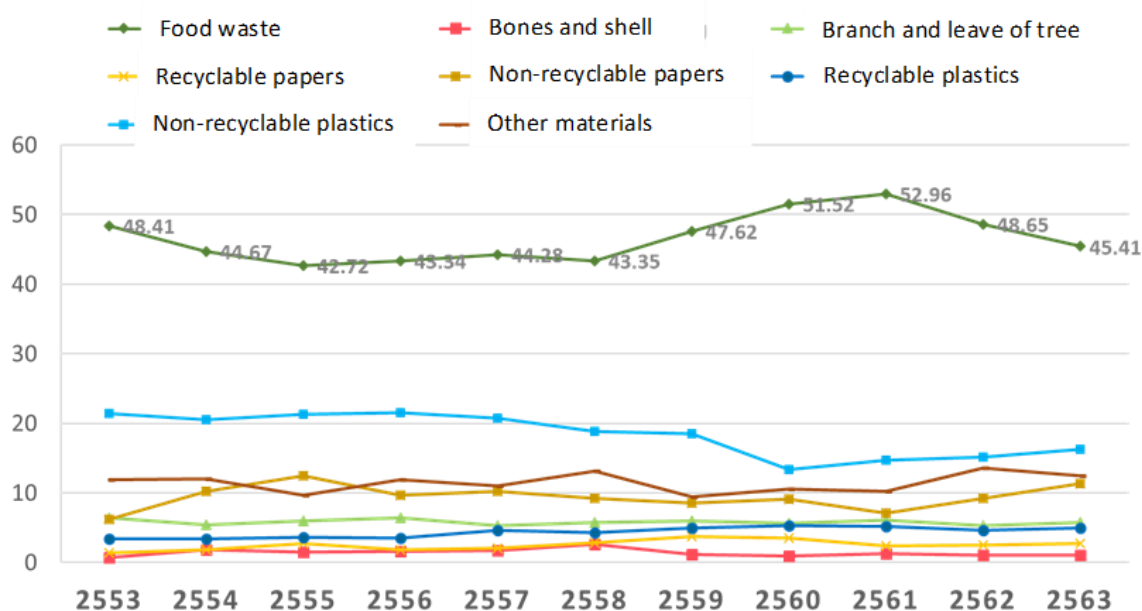


Figure: Proportion of food waste and other waste types in Bangkok area during 2010-2020

Source: Data form Department of Environment, Bangkok Metropolitan Administration (BMA)

About 1,600 tons per day of waste produced in Bangkok are composted by the disposal system at On Nut sistrict with composting technology supports 1,000 tons per day, and organic composting plant supports 600 tons per day. About 320 tons per day of food scraps are collected and fed to animals. Hazardous waste includes the remains of electrical and electronic products will be disposed of by incineration by Akkie Prakan Public Company Limited. Infectious waste will be burned by Krungthep Thanakom Company Limited at On Nut. The waste that occurs in the southern zone of Bangkok, some

will be disposed of at a waste disposal plant that generates electricity for the environment which is an incinerator system at Nhong Khem district that can support 500 tons per day. Additionally, BMA will manage the remaining waste to landfill located in Chachoengsao Province and Nakhon Pathom Province.

For the causes of food waste, from the interviews with relevant stakeholders and review of relevant studies which used to conduct surveys about the occurrence of food waste from various groups in Bangkok. Through the interviews with entrepreneurs and observation of activities in the sample areas are as follows:

1) Food distribution

- **Transportation problem;** most supermarkets have a system to return products damaged in transit. The damaged products mostly on the packaging such as the product label is broken which must be eliminated. And often there is a problem with the large markets that are purchased by contractors and long-distance transport.
- **Product storage problem;** it is often a problem of large markets with selling place for wholesale products without proper management. In the small markets, there is not enough storage equipment. Other problem includes markets without air conditioning system causing damaged to vegetables and fruits easily.
- **The problem of deteriorated short-lived products;** occurred in supermarkets and convenience stores, products such as milk, ham, short-lived products that are close to expiration are regularly discarded and especially in the markets without refrigeration system.
- **Security requirements issue;** causing the need to eliminate food products that are not suitable for each company's distribution, contribute to increased food waste, damaged or scratched packaging causing the entire package to be disposed of even if the product inside is not deteriorated or damaged.
- **Customer behavior problem;** usually occurs in supermarkets and convenience stores where products are placed on shelves for customers to choose for themselves, where the product is touched and damaged.
- **Employee shortcomings;** supermarkets and convenience stores change employees frequently. Employees in some establishments are migrant workers who do not yet understand.
- **Economic competition problem;** supermarkets and stores that sell the same products would have regular promotions to attract customers, causing food products may not be sold out and deteriorated.
- **Problems with the shape of agricultural products;** which are mixed in size, color, and shape that do not meet the criteria. It's a big wholesale market problem with a big lot or wholesale purchasing and then select the products that do not meet criteria out later.
- **Problem of disposing expired and leftover food;** some establishments have regulations that have to dispose leftover food. They don't donate due to fear of affecting the image of the organization if there are complaints which would be difficult to control.

2) Food services

- **Transportation problem;** for the hotels or large restaurants, there will be a purchasing department to manage the damaged foods in transit. Smaller restaurants tend to buy by themselves from nearby vendors, therefore, there is rarely a problem from transportation.
- **Product storage problem;** it is found in small restaurants that do not have enough equipment to store the foods. Weather has become another factor when at certain times it might be too hot.
- **Customer behavior problem;** leftover foods on the plate caused by ordering too much, or over taking the buffets, or ordering food to try and doesn't taste good.
- **Employee shortcoming;** when the staff wrote down the details of the orders that did not match what the customers ordered, causing food returning. This also include changing of the person responsible for cooking which can change the taste of food.
- **Problem on raw materials left from cooking;** most cooks would use only some ingredients in cooking process, and the rest must be discarded. While there are some large hotels or restaurants having menu where almost all parts of the ingredients and even the excess food from the sales can be used to make other dishes.

3) Households

- **Problem from the lack of planning for food purchase;** lack of food inspection on what are available or necessary, as well as from the store's marketing strategy that stimulates sales, causing consumers to buy more than necessary to them.
- **Food storage problem;** both on storage in the temperature is not suitable and the lack of a proper food storage system, causing food residues to deteriorate.
- **Confusion over food age information;** there is a misunderstanding or confusion between the symbols "Best before" and "Expiry date", on what is the difference between these two symbols?
- **Problem of refusing to accept products with unusual shapes;** such as distorted fruit, alkaline color, will be discarded because no consumer will purchase these products.
- **Problem with raw materials from cooking;** cooking is another stage of household food waste from cutting, decorating or discarding inedible parts such as mature leaves, vegetables with not good appearance, hard stems or roots that are not edible. Some parts would only be used as ingredients in the cooking process, the rest must be discarded without knowledge of other uses or not at all having attention to those raw material scraps

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_31027

