

USING GREEN AND DIGITAL TECHNOLOGIES TO REDUCE FOOD WASTE AT THE CONSUMER LEVEL

CASE STUDY: BANGKOK, THAILAND

SEPTEMBER 2021



Consumer food waste in Bangkok

A survey conducted in 2019 by the Office of Natural Resources and Environmental Policy and Planning (ONEP) found that in Bangkok, food waste accounted for 53% of municipal solid waste (MSW).¹ Another study found that the average amount of food waste in households is 0.38kg per person per day before separating liquids, and 0.25kg per person per day after separating liquids.² The Bangkok Metropolitan Administration (BMA) is directly responsible for waste management and controls the three main transfer stations (Onnut, NongKheam, Sai Mai) located in different parts of the city where collected waste is separated and processed for disposal. According to BMA, in 2020 the city generated 3.47 million tons of municipal solid waste, or 9,519 tons per day; 51.17% of that amount was food waste.³

The Green Tech and Consumer Food Waste project in Bangkok⁴ found that lack of separate waste collection, inadequate policy incentives, limited awareness and understanding of the food waste problem, absence of suitable technology and data scarcity are the main challenges for food waste reduction and management in Bangkok.

¹ Office of Natural Resources and Environmental Policy and Planning (ONEP) (2019), Full Report on the Study of Food Loss Management for Sustainable Consumption. Ministry of Natural Resources and Environment.

² Pharino, Chanathip (2019), Rate of Food Waste Generation in Thailand and the use of Voluntary Carbon Market. Department of Local Administration, Ministry of Interior.

³ Environment Department, BMA (2020), Components of MSW in Bangkok.

⁴ UNEP project "Using Green and Digital Technologies to Reduce Food Waste at Consumer Level": <https://www.unep.org/explore-topics/green-economy/build-back-better>.



53% of municipal solid waste was composed of food waste in Bangkok in 2019.



Average amount of food waste in households in Bangkok is **0.38kg** per person per day before separating liquids.



Thailand's Environmental Quality Management Plan (2017-2022) calls for unified efforts to support food waste reduction by the public and private sectors.



Bangkok's 20-year Waste Management Strategy, puts forward a vision to manage municipal solid and hazardous wastes based on the "zero waste" principle.



Tackling the waste problem

Thailand is tackling the food waste problem through a number of ways:

- The Policy and Plan to Promote and Preserve the National Environmental Quality (2017-2036) notes the issue of food waste management, and public information – through the development of a modern data collection platform – is highlighted. There is also an emphasis on developing strategies for reducing food waste in businesses and households.
- The Environmental Quality Management Plan (2017-2022) calls for unified efforts to support food waste reduction by the public and private sectors.⁵ It also calls for a clear strategy to reduce waste across the entire food supply chain – from production, distribution, transportation and processing in the agricultural industry and food businesses to the household level.
- The Sustainable Production and Consumption Plan (2017-2037) stresses the need to empower local authorities to manage waste, including food waste, more effectively.
- The Draft Action Plan (2021-2027) for Thailand's development of a Bio-Circular-Green Economic

Model (BCG) highlights the need for the use of technology to combat food loss and food waste, as well as the urgency to change public behaviour through awareness-raising and knowledge-sharing activities in all segments of society.

- Bangkok's 20-year Waste Management Strategy, announced in 2013, puts forward a vision to manage municipal solid and hazardous wastes based on the "zero waste" principle to reduce, reuse and recycle.⁶ This plan is divided into three stages: upstream, midstream and downstream.
- Through community-based programmes, BMA is encouraging household composting in Bangkok's 50 districts through knowledge sharing and pilot projects, and working closely with vendors in local fresh markets; conversion of food waste into bio-fermented water and animal feed is also encouraged.

⁵ Karatna, Patcharasorn (2017), Thailand Environmental Quality Management Plan 2017-2021. ONEP. https://www.unescap.org/sites/default/files/ONEP%20_%20NEQMP.pdf.

⁶ Lammawichai, Janya (2017), Solid Waste Management in Bangkok. https://www.jesc.or.jp/Portals/0/center/training/10thasia3r/8.10thasia3r_bangkok.pdf.



Role of green and digital technologies

The upsurge in the number of mobile phone users in Bangkok – 92 million mobile subscribers and 55 million active mobile internet users⁷ – provides a great opportunity for green and digital technology, especially for many young entrepreneurs and start-ups. One example is Yindii, which uses digital tech to connect surplus food providers with consumers. Through its mobile app, individuals can purchase surplus food from restaurants across the city and join the fight against food waste. There are also emerging circular business models that link food waste with sustainable urban farming. Two social enterprises, Wastevegetable and Bangkok Rooftop Farming, collaborate to form a closed-loop business

model. While the former collects and converts food waste into compost, the latter transforms commercial and office building rooftops into urban farms where compost is used to grow vegetables. However, gaps still exist. According to a UNEP online survey, there is a lack of awareness and information of using green and digital technologies for food waste reduction, especially information of good practices in the upstream "prevention" stage.⁸

⁷ Leesa-Nguansuk, Suchit (2019), Thailand tops global digital rankings. Bangkok Post. <https://www.bangkokpost.com/tech/1631402/thailand-tops-global-digital-rankings>.

⁸ "Online survey to engage with public opinion on the management of food waste in Bangkok" by UNEP and TEI, launched between 9-19 May 2021.



The way forward

An enabling policy environment is needed to ensure that green business champions get rewarded for their efforts in adopting and innovating green tech. This includes offering economic incentives, modifying legal frameworks and regulations, providing affordable infrastructure to reduce operation costs, such as transportation and internet connection, and connecting start-ups with investors, incubators and expert communities. Policy instruments such as tax rebates and subsidies, banning or taxing food waste at landfills, and “sustainability labels”, can stimulate changes in business practice and consumer behaviour. An important step could be replacing the current “fixed rate” waste collection fee with one that is proportionate to the volume of waste generated. Policies also need to focus more on prevention and reduction throughout the food value chain.

More support is also needed for small and medium-sized enterprises (SMEs) that lack capacity to take part in the fight against food waste. While some champions and pioneers have started piloting green business models on food waste reduction, they need to scale up and go beyond community-based small programmes. Some SMEs

are hesitant to take actions as they are worried about the cost of deploying green and digital technologies for food waste management.

Lastly, it is crucial to raise consumer awareness and understanding of the food waste challenge and green tech solutions. More data on the cost of food waste – including economic, environmental and social cost, and savings from waste prevention and reduction – could help consumers make better-informed decisions. Campaigns and advocacy activities could also encourage more sustainable consumption and lifestyle changes.



Project partners



Thailand Environment Institute (TEI)



Bangkok Metropolitan Administration (BMA)

This summary was prepared for the project “Using Green and Digital Technologies to Reduce Food Waste at Consumer Level” led by UNEP. More information about the project can be found at: <https://www.unep.org/explore-topics/green-economy/build-back-better>

Coordinators: Ying Zhang (UNEP), Pornphrom Vikitsreth (UNEP)

Editor: Mark Schulman (GGKP)

Designer: Yi-Ann Chen (UNEP)