

# **Solid Waste Management Inside Saphan Hin Park in Thailand Under the COVID-19 Control Measures**

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## **INTRODUCTION**

Saphan Hin Park is a famous public park in Phuket Town in Phuket Province, Thailand. It is located in the city center and is surrounded by the sea. Most of this area is used for exercise, relaxation, trade shows, and expos. It is an important location with a great view and sport centers, a sport field, and a stadium for competition at national and international levels. Other facilities include a swimming pool, computer center, youth center, and shrine. It is open every day from 7 a.m. to 7 p.m. (Phuket City Municipality, 2020). Since this park is a popular place for exercise and relaxation, many services are available. The number of people and the broad extent of activities inside the area are major factors that produce solid waste. During the study period, the park was open for service under the guidelines for the prevention of COVID-19 (Phuket City Municipality, 2020). Therefore, this paper aimed to study solid waste management inside Saphan Hin Park during the COVID-19 control measures.

## **MATERIALS AND METHODS**

Solid waste management was studied in two main areas inside Saphan Hin Park: sport centers that included two sport buildings and a pétanque field and a minimarket that were open daily. The study focused on the types and quantities of solid waste, waste storage and collection, waste transfer/transport, and disposal. The types and quantities of waste materials were studied by sort segregation and all waste was weighed. All collected data were classified into weekday and weekend during July and August 2020 under the COVID-19 control measures that were established after the lockdown restrictions were lifted on 30 April 2020.

## **RESULTS AND DISCUSSION**

### **Types and quantities**

The total amount of waste from the two main areas was 429.49 kg, which consisted of 135.23 kg of waste from the sport centers and 327.26 kg of minimarket waste. All waste in each group was categorized into weekday and weekend. The total amounts of waste from the sport centers on weekdays and weekends were 68.28 kg and 72.95 kg, respectively, and the rates of waste produced on the weekdays and weekends were in the range of 0.03-0.04 kg/person/day. At the minimarket, the total amounts of waste produced on the weekdays and weekends were 254.96 kg and 73.30 kg, respectively, and the rates of waste generation were in the range of 0.02-0.03 kg/person/day. The waste was categorized into four types: compostable waste, general waste, recyclable waste, and hazardous waste (Table 1).

**Table 1 Type and percentage of waste quantity**

| Types of solid waste | Sport centers (%) |         | Minimarket (%) |         |
|----------------------|-------------------|---------|----------------|---------|
|                      | Weekday           | Weekend | Weekday        | Weekend |
| Compostable waste    | 22.50             | 26.87   | 58.56          | 68.77   |
| General waste        | 36.82             | 32.93   | 32.55          | 19.25   |
| Recyclable waste     | 39.23             | 40.11   | 8.62           | 11.98   |
| Hazardous waste      | 1.46              | 0.10    | 0.28           | 0.00    |
| Total                | 100.00            | 100.00  | 100.00         | 100.00  |

### **Waste storage and collection**

None of the waste materials in the waste containers placed inside the two areas was separated at the source. The containers in the sport centers had black plastic bags placed inside medium sized baskets and plastic bins (sizes 100, 120, and 240 liters). At the minimarket, the containers had black plastic bags placed inside dark blue plastic bins (size 240 liters). All waste in the two areas was collected from the containers and moved to an incinerator plant directly by waste handlers employed by the municipality using compact garbage trucks. The areas in this study did not have, but should have had, bins for separate types of waste to reduce the amount of waste for disposal and easier management.

### **Waste transfer/transport and disposal**

The waste materials were transferred and transported from the sport centers and minimarket by three and four municipal waste handlers, respectively. All waste was transported from the containers by compact garbage trucks (size 1.44 tone) without waste separation. The waste was transported once daily at 9 p.m. for disposal by incineration. The vehicles for waste transfer/transport and the waste disposal method were suitable and met the guidelines, but some waste should be separated at the source before incineration.

### **CONCLUSION**

The waste materials from the sport centers and minimarket in Saphan Hin Park were studied. The waste was classified into four types: compostable waste, general waste, recyclable waste, and hazardous waste. All waste materials were placed in plastic bins and waited for transfer/transport by municipal waste handlers using compact garbage trucks. None of the waste was separated at the source. The final stage of all waste was disposal by incineration.

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### **REFERENCES**

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