

# THE STUDY ON HAZARDOUS WASTE MANAGEMENT OF MOTORCYCLE REPAIR SHOPS AT KATHU MUNICIPALITY, KATHU DISTRICT, PHUKET PROVINCE, THAILAND (\*)

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## Abstract

*The Study on Hazardous Waste Management of Motorcycle Repair Shops at Kathu sub district, Kathu district, Phuket Province has objectives to study the type, the quantity and the management of hazardous waste, to study the problems and the obstacles and to find solutions for hazardous waste management. The method of this research is to gather the information about hazardous waste types and quantities for 2 months, January and February 2019, in 14 shops. Concerning to the management, obstacles, problems and solutions of hazardous waste, the researcher gathered the information by using the questionnaire with 42 entrepreneurs of the motorcycle repair shops at the Kathu municipality.*

*The result showed that the hazardous wastes were 100 percent composed of engine oil, used gear oil, inner tubes, outer tires, oil cans, gear oil cans and scraps of metal. Concerning to quantities of hazardous waste, it was found that there were 318.7 liters of engine oil and used gear oil, 328 pieces of outer tires and 2,307 pieces of inner tubes. For the hazardous waste management, It was found that 100 percent of the following hazardous wastes, engine oil, used gear oil, oil cans, gear oil cans, car chain, sprockets, spark plugs, bearings, disk brake pads, batteries, containers for used oil, grease cans and oil-contaminated scraps of metal were sold to other companies. The entrepreneurs discard 100 percent of light bulbs and oil-contaminated containers in the municipal bin. The entrepreneurs reuse 100 percent of oil-contaminated hand towels. The other way of hazardous waste management is to sell 38.09 percent of outer tires to the fishermen for mussels' cultivation. It was found that 80.95 of light bulbs and inner tubes were discarded in the same bin of normal waste because the other companies do not buy them. This is the main problem of hazardous waste management. The study on the suggestion of hazardous waste management found that 59.52 percent of the entrepreneurs need the related authorities to collect correctly the hazardous wastes.*

**Keywords:** Hazardous Waste; Management; Motorcycle Repair Shops; Phuket.

## 1. Introduction

The pollution caused by hazardous waste is a major concern. If the hazardous waste contaminates the environment, it will cause negative impacts on living creatures, to the environment, to the food chain and to the health of habitants [1].

There are many motorcycle repair shops at Kathu municipality because there are a lot of demands for repairing the motorcycle or changing the oil. The motorcycle repair shops provide a repair service for motorcycles broken by use or accident.

The motorcycle repair shops must have equipment or material which contaminates the hazardous wastes for repairing the motorcycles. The hazardous waste can cause a danger to the user, for example, used gear oil or engine oil lost its original quality and it is composed of hydrocarbon organic substance, solvent, heavy metal, etc. The incorrect management of hazardous waste can cause severe danger to the environment, animals, plants and human beings [2]. Interested in this problem, the researcher focuses on the hazardous wastes originated from motorcycle repair shops at Kathu

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\* Exchange paper.



municipality, Kathu district, Province of Phuket. Therefore, the researcher studies the type, quality, and management of the hazardous waste caused by the motorcycle repair shops.

## 2. Methodology

The study on hazardous waste types and quantities was carried out with 14 motorcycle repair shops for 2 months, January and February 2019. Then the researcher analyzes the gathered information by using a basic statistic - percentage - and presents the information in the tables.

The study on hazardous waste problems, obstacles and suggestions was carried out with 42 entrepreneurs at Kathu municipality by using the questionnaire. Then the researcher analyzes the gathered information by calculating the frequency and percentage.

## 3. Results

The result of the study on hazardous waste types and quantities found that the hazardous wastes were 100 percent composed of engine oil, used gear oil, inner tubes, outer tires, oil cans, gear oil cans and scraps of metal. Concerning to quantities of hazardous waste, it was found that there were 318.7 liters of engine oil and used gear oil, 328 pieces of outer tires and 2,307 pieces of inner tubes.

The result of the study on hazardous waste management

The result of the study on hazardous waste management by storing the waste represent in the Table 1.

**Table 1. Methods of storing hazardous wastes of Motorcycle Repair Shops at Kathu municipality, Kathu district, Province of Phuket**

Waste types	Methods of storing	
engine oil, gear oil	Use 200 liters container for storing engine oil and gear oil.	Use 30 liters plastic container for storing engine oil and gear oil.
outer tires	Stack the used outer tires in front of or behind the shops.	Hang or stack the used outer tires at (on) the motorcycles.
inner tubes	Stack the used inner tubes beside or behind the shops.	Hang or stack the used inner tubes at (on) the motorcycles.
scraps of metal	Put scraps of metal such as sprockets, chain and wheel studs in a fertilizer sack.	Put scraps of metal such as chain, cog and bearing in a metal basket.
oil cans, gear oil cans	Put oil cans and gear oil cans in a fertilizer sack.	Stack oil cans and gear oil cans in the shops.
battery	Put unusable battery in a paper box without a container base and put it in the shops.	Put unusable battery without a container base and put it in the shops.

The result of the study on hazardous waste management by using the questionnaire found that:

- 100 percent of the following hazardous wastes, engine oil, used gear oil, oil cans, gear oil cans, car chain, sprockets, spark plugs, bearings, disk brake pads, batteries, containers for used oil, grease cans and oil-contaminated scraps of metal were sold to other companies which is in accordance with the study on Hazardous Waste Management of Automobile Repair Shops at Kathu municipality, Talang district, Province of Phuket of Sena Salea [3]. It showed that the other companies accepted to buy the engine oil and scraps of metal the most.

- 100 percent of light bulbs and oil-contaminated containers were discarded in the municipal bin.
- 100 percent of oil-contaminated hand towels were reused.
- The other way: it was found that 38.09 percent of outer tires were sold to the fishermen for mussels' cultivation.



### 3.1. The result of the study on problems, obstacles and suggestions presenting in the tables

**Table 2. Problems and Obstacles of Hazardous Waste Management**

Order	Suggestions	Frequency	Percent	Ranking
1	In your opinion, what is the cause of the problems of Hazardous Waste Management for your Motorcycle Repair Shops?			
	There is no specific area for Hazardous Waste.	16	38.10	2
	There is no container.			
2	Lack of knowledge and understanding of Hazardous Waste Management	20	47.62	1
	In your opinion, what is the cause that oppose separating the wastes?	6	14.28	3
	Lack of knowledge and understanding of Hazardous Waste Management	7	16.67	3
	There is no specific area for Hazardous Waste.	14	33.33	2
	insufficient container for each waste	19	45.24	1
	Waste of time to separate wastes	2	4.76	4

**Table 3. Suggestions for Hazardous Waste Management**

Order	Suggestions	Frequency	Percent	Ranking
1	They want the related authorities to collect correctly the hazardous wastes.	25	59.52	1
2	It should have specific bins for each hazardous waste.	12	28.57	2
3	The related authorities shall provide the motorcycle repair shops a seminar about hazardous waste management.	5	11.91	3

**Acknowledgement:** Thank you to the Environmental Science Program, Faculty of Science and Technology, Phuket Rajabhat University for their information and their valuable contributions to this research and for the accomplished research.

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