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TECHNOLOGY****OPTIMIZATION OF WASTE MANAGEMENT AT THE AUTOMOTIVE SHOPS IN
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ABSTRACT

This study assessed the waste management practices of the different Automotive Service Shops in Metro Cebu using the descriptive method. Results of the study revealed that most employees of the “All-Service Auto Shops” have no formal trainings on waste management contrary to the staffs of “New Cars Dealer Shops” that have formal training and equipped with waste management facility and equipment. Automotive shops utilized waste management practices like: collection, segregation, storage, treatment, disposal and recycling. Data show that All Service Auto Shops produced more hazardous wastes compared to New Cars Dealer Shops. Nonhazardous wastes generation was found to be minimal.

It can be concluded that All Service Auto Shops have lesser accord to waste management. Their production of more hazardous wastes could be attributed for catering service of old and used vehicles.

KEYWORDS: accord, material recovery facility, wastes treatment

INTRODUCTION

Waste management is a component of environmental science a new field of study brought about by the need to study nature and how human being is changing it (Tayo, et. Al., 2004). It emerged as an area of study as man realized his responsibility of protecting the environment by way of proper waste disposal in the midst of worsening problems of garbage disposal, pollution, climate change, and other related environmental degradation.

Every human activity is equated with waste. From the normal walking to travelling, even the simple eating to food processing, and much more on automobile servicing, each produces wastes that when not properly contained or disposed may cause some problems to the environment. Apparently some of the ill effects of these problems are being felt these days.

Moreover, the long years of people’s apathy or less concern to the environment have resulted to serious problems on garbage disposal, pollution, climate change and other related problems on environmental degradation. These are quite apparent on the several disasters affected the country and most particular on the flash floods that hit Metro Cebu on January 25, 2011 and typhoon Ondoy that devastated in Metro Manila last 2009. It also confirmed that climate change is real and improper waste disposal is contributory to flash floods that destroy lives and properties.

Societal change brought about by impressive growth in manufacturing productivity has resulted in the exceptional increased in material wealth and raising the living standard of the people as characterized in the 20th century. Consequently, in the mid-1990’s more than 50 million motor vehicles were manufactured each year. In which 37 million were passenger cars and the remaining 13 million were trucks and buses (Olney, 2007).

Likewise, the booming car sales that are happening in the country are phenomenon that cannot be taken lightly. Record shows that for 2009 a total of 500,959 motor vehicles were registered at Land Transportation Regional Office 7. This is consistent to the yearly increase of 5 to 10 percent (Sunstar, 2010). In addition, the chamber of

automotive manufacturers of the Philippines Inc. (Campi), reported that 168,000 units were sold in 2010. Vehicle sales in the country for 2015 reached at about 288,609 units. The country's automotive industry has this unprecedented growth in sales for the last five years.

More than this is the concern for the volume and the types of other wastes that could be generated out of the consequence of this currently big and continuously increasing number of vehicles every time servicing will be performed in keeping their road worthy condition.

This study was conducted in order assess the waste management practices of automotive shops in Metro Cebu as to: Training of personnel; Availability of waste facility and equipment; Volume of wastes generated and Awareness of the respondents in the compliance of environmental laws. Likewise, the conduct of this study is also in accordant with the automotive repair code of practice which requires management of proper containment and disposal of automotive wastes such as petroleum products also regulated are heavy metals such as grits and sands (<http://www.crd.bc.ca/wastewater/sourcecontrol/business/automotive>).

MATERIALS AND METHODS

This study was conducted in Metro Cebu which comprises the cities of Cebu, Mandaue, Lapu-lapu and Talisay. The respondents were managers and employees of the identified automotive shops in Metro Cebu. For fitness and suitability of this study, automotive shops were grouped into two categories: the All Service Automotive Shops and New Cars Dealer Shops as a way of identifying them. This is on the premise that All Service Automotive Shops they accept all types of servicing and repair for automotive vehicles regardless of model. While New Cars Dealer Shops they only provide service and repair for a specific brand or car model. As a result, a total of 47 All Service Automotive Shops was from Cebu City; 38 from Mandaue City; 7 from Lapu-lapu City and Talisay City have 12. For New Cars Dealer Shops category: Cebu City registers 5 shops; 8 from Mandaue City; and none from the cities of Lapu-lapu and Talisay. This paper utilized judgment sampling, a common non-probability method of determining respondents. Thirty percent (30%) of the registered All Service Automotive Shops and New Cars Dealer Shops were taken as respondents. Results from the survey were analyzed using simple statistical tools.

RESULTS AND DISCUSSION

Results of the study revealed that on the question of trainings and seminars on waste management and environmental laws, most of the employees of the *All Service Auto Shops* have no formal trainings and seminars on waste management. As shown in Table 1 of the 26 respondents only 12 or 46.15 % attended training on waste management and 14 or 53.85 % has no training. For training or seminar on environmental laws, only 10 respondents have training and 16 or 61.54 % have not.

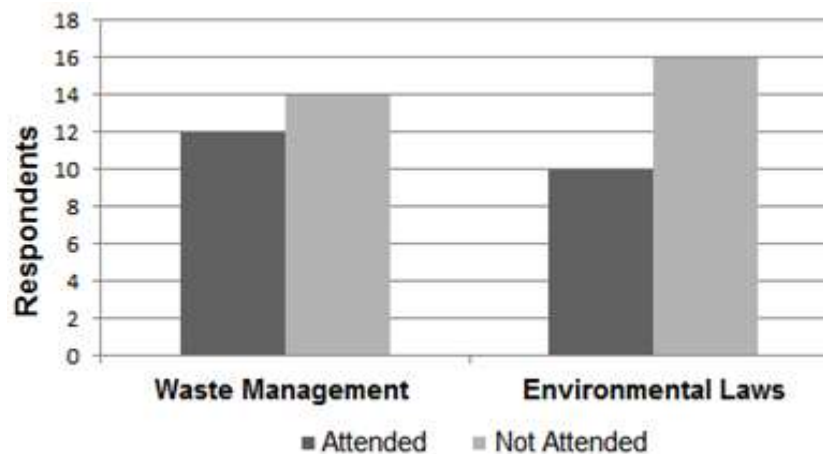


Figure 2 Trainings / Seminars Attended By All Service Auto Shop Respondents (n=26)

On the contrary the *New Cars Dealer Shop* respondents demonstrated a 100% of these trainings and seminars as presented in Figure 3.

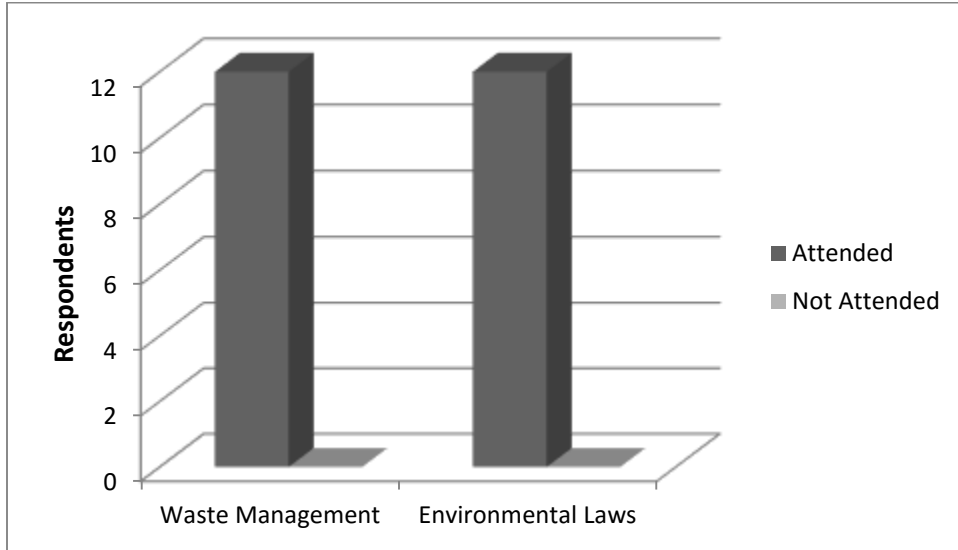


Figure 3 Trainings / Seminars Attended by New Cars Dealer Shop Respondents

Figure 4 also revealed that *All Service Auto Shops* have limited waste facility and equipment compared to *New Cars Dealer Shops* which is more equipped in waste facility and equipment.

Gathered results disclosed further that these identified auto service shops employed the usual waste management practices such as: Collection, Segregation, Storage, Treatment, Disposal and Recycling.

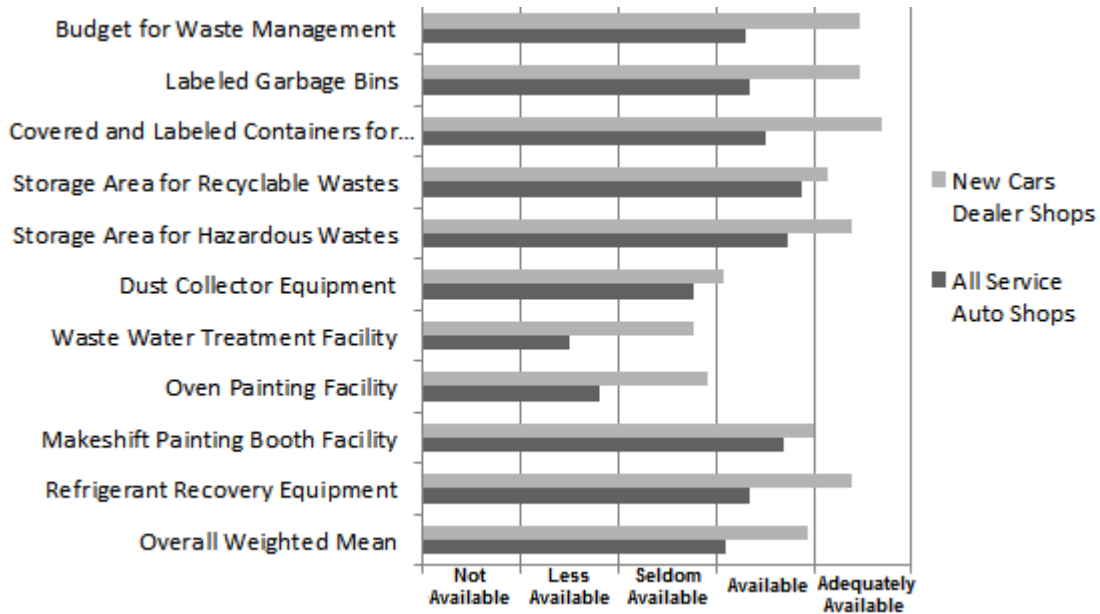


Figure 4 Available Waste Management Facilities and Equipment for Both All Service Auto Shops and New Cars Dealer Shops

As to the volume of hazardous wastes generated, Table 1 shows that *All Service Auto Shops* produced more hazardous wastes. The results indicated that automotive wastes such as: *discarded oil filters, spent diesel, spent kerosene, used oil, used flashing oil* were estimated to be produced by 4 to 6 kilograms a day.

Similarly as portrayed on the same Table, those previously mentioned wastes were estimated to be produced by only 1 to 3 kilograms per day by the *New Cars Dealer Shops* respondents.

On non-hazardous wastes generation, Table 2 indicated that both groups of respondents produced a minimal volume of these wastes and were mostly produced by less than a kilo per day. It was also established that the production of more hazardous wastes by *All Service Auto Shops* could be attributed of its service and repair of old and used vehicles. Also noted on the findings was the treatment of wastes at company sites was not practiced this is because of the presence of garbage collector in the area and the availability of Material Recovery Facilities in the locality.

Table 1 Volume of Hazardous Waste Generated By All Service Auto Shops and New Car Dealer Shops Respondents

Hazardous Wastes Generated	Estimated Daily Volume of Hazardous Wastes Generated															
	Less 1 kilos		1 to 3 kilos		4 to 6 kilos		7 kilos Or More		Less 1 kilos		1 to 3 kilos		4 to 6 kilos		7 kilos Or More	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
1. Discarded Clutch and Brake Linings	16	61.54							13	100						
2. Discarded Oil Filters	10	38.46			16	61.54			5	38.46	8	61.54				
3. Spent Diesel			6	23.08	15	57.69			5	38.46	8	61.54				
4. Spent Gasoline	16	61.54							13	100						
5. Spent Kerosene	6	23.07			14	53.85			6	46.15	7	53.85				
6. Spent Paint	15	57.69							13	100						
7. Spent Paint Thinner	16	61.54							13	100						
8. Spent Paint Remover	16	61.54							13	100						
9. Spent Penetrating Oil	17	65.38							13	100						
10. Spent Rust Converter	16	61.54							13	100						
11. Used Automatic Trans. Fluid	16	61.54							13	100						
12. * Used Battery								* 1 6	* 61.54						* 13	* 100
13. Used Brake Fluid	12	46.15							13	100						
14. Used Engine Oil					16	61.54		9	34.62		13	100				
15. Used Flashing Oil					14	53.84		9	34.62	3	23.07	10	76.92			
16. Used Gear Oil	16	61.54							13	100						
17. Used Grease	17	65.38							13	100						

*Figures may change occasionally, especially when Battery replacement occurs.

Table 2 Volume of Non Hazardous Wastes Generated By All Service Auto Shop Respondents & New Car Dealer Shops

Non Hazardous Wastes Generated	Estimated Daily Volume of Non Hazardous Wastes Generated															
	ALL SEVICE AUTO SHOPS (n=26)								NEW CAR DEALER SHOPS (n=13)							
	Less 1 kilo		1 to 3 kilos		4 to 6 kilos		7kilos or More		Less 1 kilo		1 to 3 kilos		4 to 6 kilos		7kilos or More	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
1.Biodegradable Wastes	15	57.69							13	100						
2.Discarded Cables	15	57.69							13	100						
3.Discarded Electrical Parts	16	61.53							13	100						
4.Discarded Electronics Parts	15	57.69							13	100						
5.Discarded Fuel Filters	16	61.53							13	100						
6.Discarded Gaskets	17	65.38							13	100						
7.Discarded Mechanical Parts	6	23.08			16	61.53					6	46.15	7	53.85		
8.Discarded Spark Plugs	15	57.69							13	100						
9.Discarded Tools	15	57.69							13	100						
10. Glass and Empty Bottles			14	53.85					13	100						
11. Papers & Cartons	21	80.77							6	46.15	7	53.85				
12. Plastic Materials			21	80.77					5	38.46	8	63.53				
13. Rubber Parts	* 16	61.53							* 8	63.53	5	38.46				
14. Scrap Metals					15	57.69	6	23.08	4	30.77	9	69.23				
15. Scrap Wires	15	57.69							13	100						
16. Used Sand Papers	19	73.08							13	100						
17.Used Welding Rods	17	65.38							13	100						
18. Used Rags.			16	61.53					6	46.15	7	53.85				

*Figures may change occasionally, especially when Tire replacement occurs.

On the problem of awareness of the respondents in the compliance of Environmental Law on Hazardous Wastes, the findings show that partial awareness was evident. As shown in Figure 4, it can be noted that *New Cars Dealer Shops* respondents indicated full awareness on the provisions of the said law than those of the *All Service Auto Shops* respondents.

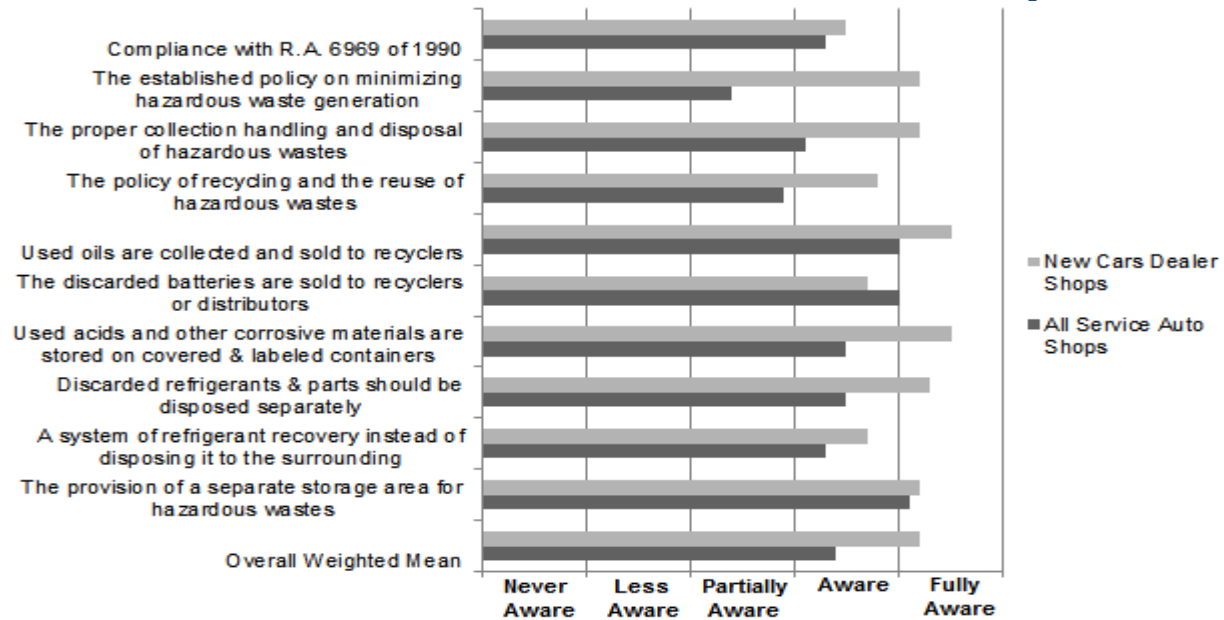


Figure 4 Extent of Awareness of the Respondents in Compliance with Environmental Law on Hazardous Wastes

Similarly, Figure 5 provides extent of awareness of the respondents in compliance with Environmental Law on Non Hazardous Wastes. As presented in this Table, it can be observed that *New Cars Dealer Shops* respondents were fully aware on the provisions on R.A. 9003 The Ecological Solid Waste Management Act of 2000 compared to the *All Service Auto Shops* respondents.

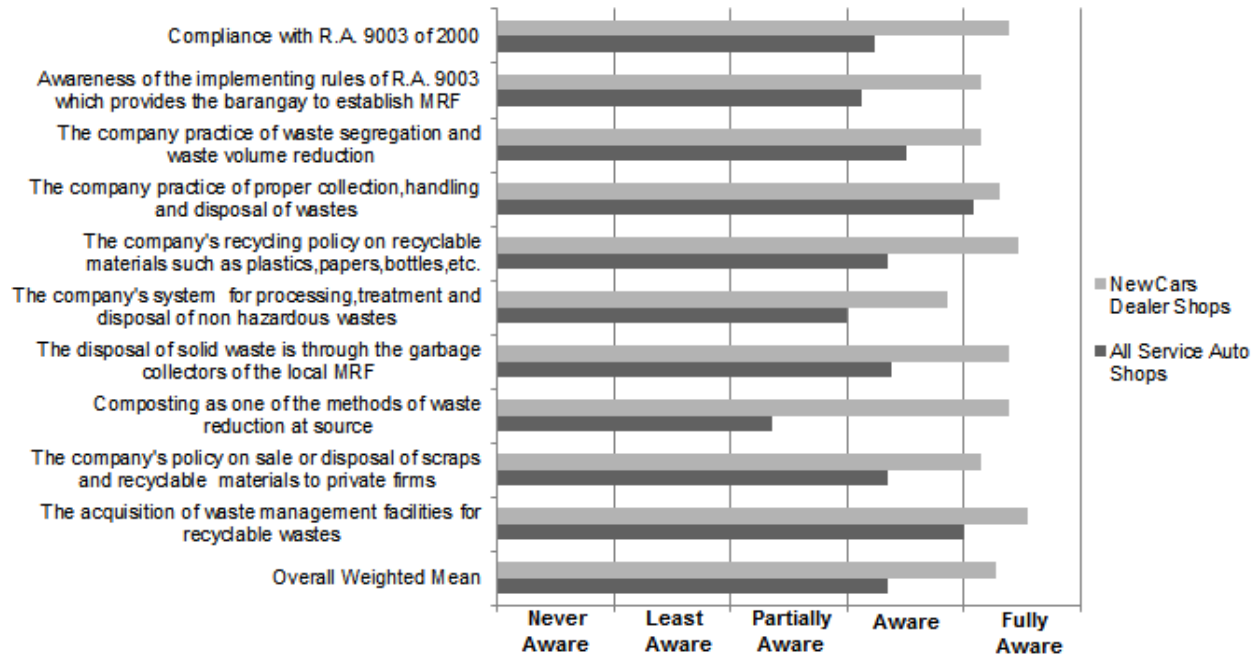


Figure 5 Extent of Awareness of the Respondents in Compliance with Environmental Law on non-Hazardous Wastes

In light of the findings these conclusions could be drawn: Employees of All Service Auto Shops have lesser accord to training on waste management and Environmental Laws than those of New Cars Dealer Shops. The production of more hazardous wastes by All Service Auto Shops could be attributed to its service and repair of old and used vehicles.

RECOMMENDATION

In order to intensify the implementation of the environmental laws, an approved Waste Management Plan must be complied with before the issuance of a license to operate by any establishment.

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