

## ANALYSIS OF CURRENT PRACTICE AND AWARENESS ON WASTE MANAGEMENT AND DISPOSAL TECHNIQUES IN SMALL SCALE FOOD INDUSTRIES

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### ABSTRACT

Food waste is increasingly being spotted as a considerable environmental and economic issue in the country. The objective of this research project was to investigate the currently used waste management techniques, knowledge and attitude on effective waste management practices among small scale food industries in Sri Lanka. Research was carried out based on a comprehensive questionnaire survey. Results revealed that the priority given on waste management in small scale food industries is low due to the constraints such as lack of knowledge, technology and financial issues. Majority of the industries generate solid and liquid waste whereas concern on gases wastes if any is very poor. Around 31% of the industries dump their biodegradable waste into the garbage truck where as only 20% do composting. Around 78% of the industries dump their non-bio degradable waste into garbage trucks and about 11% of them incinerate polythene, plastic and rubber. The most of organic and inorganic liquid generating industries discharges their waste into drains and waterways directly. Most of the industries do not adequately handle the bio-degradable wastes while majority is willing to get support and knowledge from the relevant authorities. It is recommended for the improvement of the function of relevant regulatory bodies and the strong commitment of the industries towards the implementation of practically viable waste management strategies while overcoming the technological and financial challenges.

**Key words:** Small Scale Food Industry, Waste Management, Knowledge

### 1. INTRODUCTION

As one of the rapidly developing countries in Asia, development of various industries has detectably increased the amount of waste generation in Sri Lanka during past few decades. Most importantly, in order to full fill the escalating demand for the food due to the growing population together with rapid urbanization there can be seen a significant increase in small scale food industries in the country during recent past [1]. Consequently, food waste is increasingly being spotted as a considerable environmental and economic issue [2].

In this context, implementation of waste management techniques with improved efficiency, minimize the waste generation by using proper processing methods and reduce the

direct dispose of waste to the environment are of crucial importance not only to overcome the socio economic challenges associated with waste generation but also to achieve the goals of sustainable development of the country.

This research project was conducted to investigate the currently used waste management techniques, knowledge and attitude on effective waste management practices among small scale food industries in Sri Lanka.

There is a significant increase in establishing of small scale food industries within Colombo district, as the commercial capital and the largest city with the highest population density of approximately 17,344 per km<sup>2</sup> in the country during recent past [1]. Consequently, the research project was conducted by selecting the small

scale food industries in Colombo district.

## 2. METHODOLOGY

According to the World Bank Report 2014 the industries with less than 25 labor force and invested capital of less than one million Sri Lankan rupees were defined as small scale food industries.

The study was conducted based on a questionnaire survey. Firstly, a pilot study was carried out by selecting 12 small scale industries in order to justify the content of the questionnaire and to ensure the feasibility of the application of the method in actual context and to do any improvements if needed prior to the actual survey.

Secondly, the actual survey was conducted by selecting different types of 35 small scale food industries within the Colombo district. These selected industries included dairy, bakery, sweets, beverages, food supplements and canned foods industries.

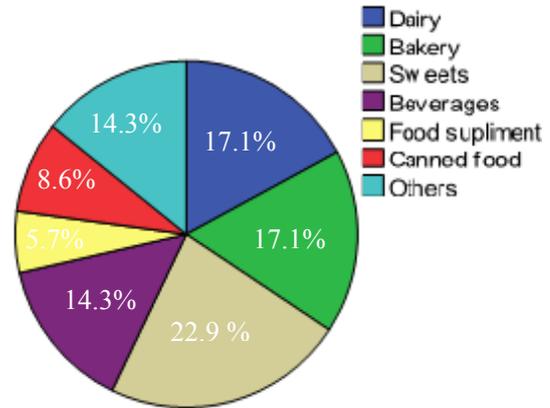
A collection of questions with possible responses and open ended questions was provided and were evaluated by face to face interviewing of an authorized personal in the industry. The data was collected on amount and type of the waste generation, method of disposal, knowledge and attitudes on waste management and minimizing strategies and waste disposal regulations and policies.

The data collected were analyzed using the IBM – SPSS (Statistical Package social Science) software and Microsoft Excel 2010

## 3. RESULTS AND DISCUSSION

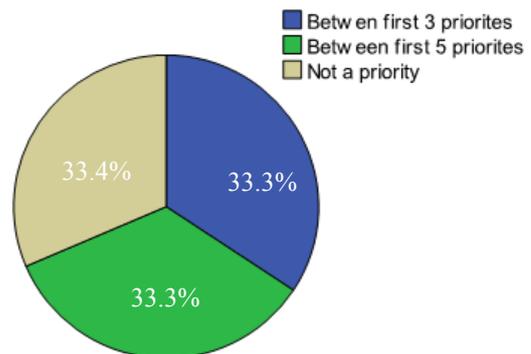
Figure 1 shows the composition of industries selected where 22.9% sweets, 17.1% dairy and

bakery, 14.3% beverages, 8.6% canned food, 5.7% food supplements and 14.3% of other industries which mainly included spice productions and macaroni productions industries.



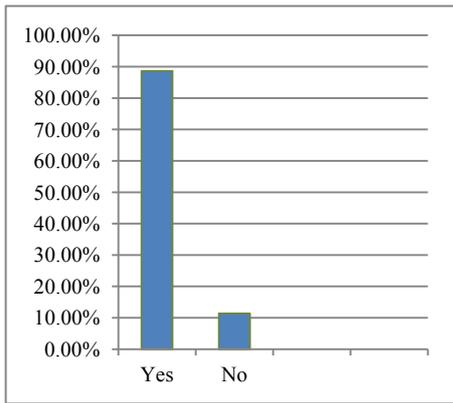
**Figure 1: Overall composition of industries that were interviewed**

Figure 2 shows concern of these industries on the waste management and disposal.



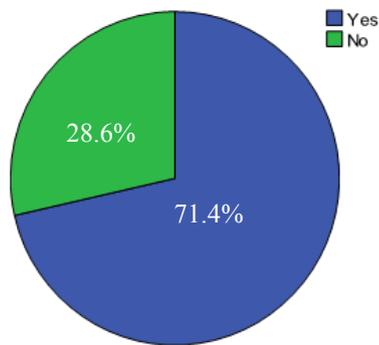
**Figure 2: Prioritization of waste management and disposal**

As can be seen in Figure 2, around only one third of the industries concerns on waste management and disposal between their first three priorities. On the other hand nearly the same proportion of industries gives less or no priority on waste management.



**Figure 3: Facilities for disposal of waste**

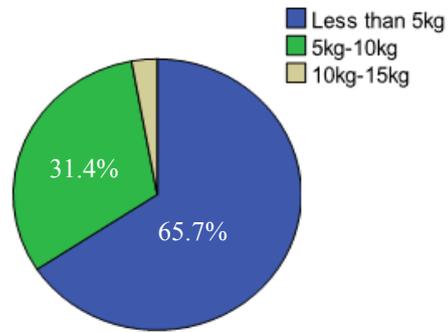
Figure 3 shows the responses made on the question on whether they have enough space to dispose waste or not. 88% of the interviewed industries have a sufficient space for their generated waste to be disposed within their premises. However, this is constrained due to the lack of awareness and understanding on waste management practices and financial issues.



**Figure 4: Categorization of waste**

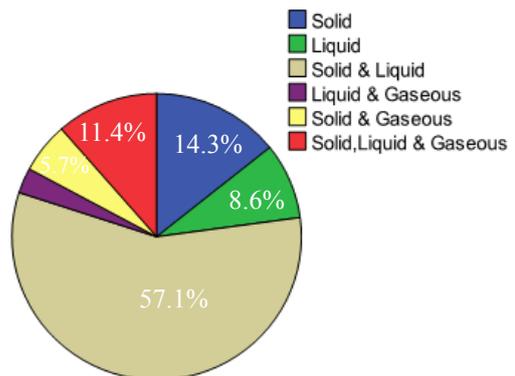
Figure 4 depicts the state of waste categorization practices among the industries. As can be seen in Figure 4, it can be noted that around 71.4% of the interviewed industries categorize their waste into solid, liquid and gas before dispose. This implies most of the industries concern about their waste management and disposal methods while around 30% of them directly discharge waste without categorization. During the interviews it was noted that some of the companies who categorize waste do it just because of the municipal council

asks to do so. Further, the companies do not categories waste does not aware on consequence on improper waste management and disposal at all and there is no any dedicated personnel working on that at all.



**Figure5: Approximate amount of waste generated within an industry per day**

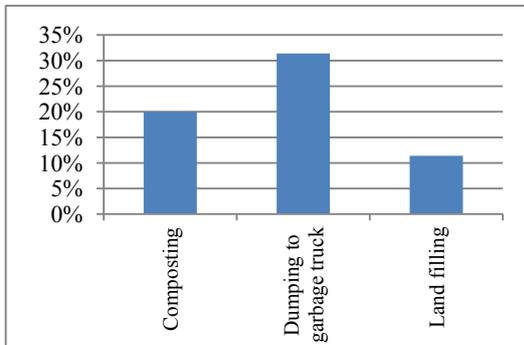
Figure 5 shows the categorization based on approximate amount of waste generation per day. It can be noted that 65.7% of small scale food industries hatches less than 5 kg of waste, whereas around 35% of the industries generates waste between 5 to 15 kg. It can be hypothesized that even though the amount of waste generated by each individual industry is relatively small, it could still have a considerable impact on the environment with the increase of the number of the industries and the density.



**Figure 6: Types of waste**

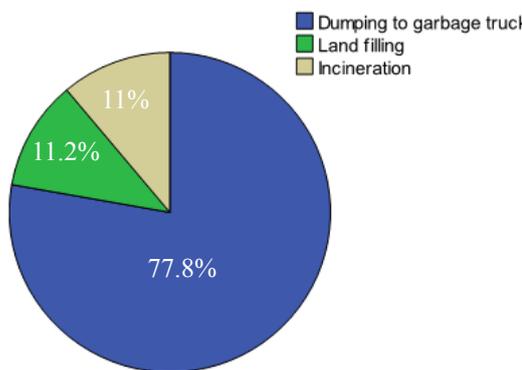
As shown in Figure 6, from the industries that categorize waste, around 57.1% gets solid and liquid wastes and less than 3% of industries

concerns about gaseous wastes. It was noted that, even though their industrial process generates gaseous waste, most of them do not identify it as a waste that they should concern about.



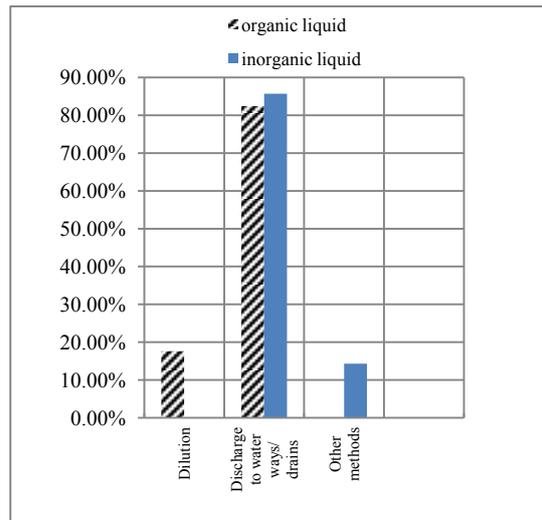
**Figure 7: Methods of disposing bio-degradable solid waste**

According to the study, 31.4% of the industries that generate solid wastes dump their bio degradable waste into garbage truck and about 20% of them compost their biodegradable waste. About 11.4% of them landfill their wastes since they generate small amount of waste and they do not have an access to a proper disposing methods.



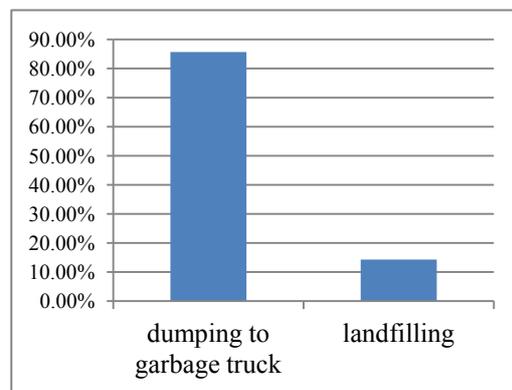
**Figure 8: Methods of disposing non bio-degradable solid waste**

It was noted that around 77.8% industries that generates non-bio degradable wastes, dumps their waste into garbage trucks and about 11% of them incinerate polythene, plastic and rubber.



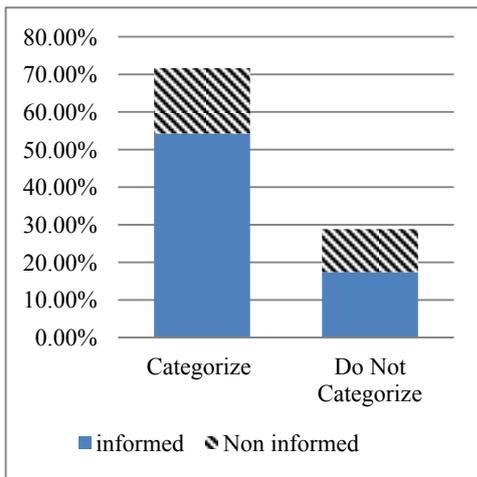
**Figure 9: Methods of disposing organic and inorganic liquid waste**

Liquid waste is segregated as organic waste and inorganic waste. As can be seen in Figure 9, the most of organic and inorganic liquid generating industries discharges their waste into drains/waterways directly causing for deterioration of water quality and hence eventually altering the ecosystem.



**Figure 10: Methods of disposing uncategorized solid waste**

More than 80% of the industries which do not categorize waste directly dump it into the garbage truck.



**Figure 11: Relationship between waste categorizing and acknowledgement on proper disposal techniques**

Figure 11 shows the relationship between industries who had informed on proper waste management techniques and industries who categorize their waste.

As shown in the Figure 4 around 71.4% of the total industries categorize their waste into solid, liquid and gas. This 71.4% is comprised of 54% industries, which were informed by the authorities on waste management techniques and 17.4% industries which were categorize waste, but not well informed. On the other hand it was observed that a percentage of 17.4% industries, from the 28.6% (Figure 4) who do not categorize, ignore the fact informed by the authorities and use an on effective way such as land filling and incineration to dispose their waste. I can also be noted a group of industries of about 11.2% who are neither informed nor categorize and use land filling and incineration to dispose their generated waste without categorizing.

#### 4. CONCLUSION

This study has been able to give an insight into present practice and awareness on Waste

Management and Disposal Techniques within Small Scale Food Industries in Sri Lanka. It can be concluded that the priority given on waste management in small scale food industries is low. Even though they are aware that as an important environmental issue the implementation and practice is below the expectations. This is mainly due to the constraints such as lack of knowledge, technology and financial issues. Furthermore, most of the industries do not get the maximum benefit from bio-degradable wastes while majority is willing to get support and knowledge from relevant authorities.

In this context, it is recommended for the improvement of the function of relevant regulatory bodies through the mechanisms such as awareness programs, training and demonstration on appropriate technology and provision of financial incentive schemes in the implementation of proper waste disposal strategies. It is also strongly recommended the commitment of the industries towards minimizing the waste generation and the implementation of adequate waste management practices in site. There should be a proper budget allocation for waste management activities and most importantly industries should be encouraged to employ dedicated professional towards the task and centralized waste management strategies.

#### 5. REFERENCE

- [1] Annual Survey of Industries 2012 - Department of Census & Statistics.
- [2] World Bank (1999), *What a waste: Solid waste management in Asia*, Urban Development Sector Unit, East Asia and Pacific Unit, World Bank, Washington, D.C.