

INVESTIGATION OF PUBLIC ATTENTIVENESS, ATTITUDE AND PRACTICE ON E-WASTE MANAGEMENT IN URBAN AND RURAL COMMUNITIES IN SRI LANKA

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ABSTRACT

E-waste or electronic waste is any broken or unwanted electrical or electronic appliance. Owing to new technologies and increase in demand for new and faster appliances there is an increasing trend in the manufacturing of electronic and electrical equipment. These new technologies and appliances are indeed beneficial in improving the livelihoods and comfort of many but at the same time are detrimental. Consequently, the disposal and effective management of E- waste has become a greater concern. This study aims to investigate the public attentiveness, attitude and practice on E-waste management in urban and rural communities in Sri Lanka. Data collection was mainly done through a questionnaire survey which was designed based on the data collected from the Central Environmental Authority. The results showed that, urban population is more aware about E-waste management techniques. Despite the awareness they tend to discard E-waste wrongly as a result of lack of support and facilities. It is also noted the importance of consideration of difference of peoples' attitude and willingness to commitment between urban and rural population when design and implementation of E waste disposal and management strategies. Furthermore, it is of crucial importance to target the below 30 age group when conducting E- waste management awareness programs in both urban and rural areas.

Key words: E- waste, Management, Urban, Rural

1. INTRODUCTION

As a developing country, regulatory authorities face considerable difficulties in collecting and recycling E-waste in the country. This is mainly due to the lack of understanding and knowledge on E-waste, its negative impacts on the environment and hence the socio-economic influences and also the E-waste management practices. The growing demand for electronics and the increasingly short life span of these devices make this problem much harder to handle. This problem is complex and solutions will not come quickly or easily.

The generation of E-waste from general consumption of the large household appliances represent the largest proportion of E-waste in the country [1]. As a result, the consumption of electrical and electronic products such as computers, mobile phones and televisions have been considerably increased in the country during past few decades [2]. Sri Lanka is now dealt with the problem of huge amounts of E-

waste generation and management. E-waste is of concern largely due to the toxicity and carcinogenicity of some of the substances if disposed or processed improperly. Overall, these hazardous wastes are currently disposed in road sides, dump yards and sometimes in home gardens [4].

The national policy on E-waste management has already been drafted and plenty of public and private partnerships have been established to manage the E-waste in a sustainable way.

The Ministry of Environment and Renewable Energy and the Central Environmental Authority (CEA) are heading the efforts as policy makers and enforcers of the law [3]. In addition to achieving a draft policy for E-waste management, the next best thing that Sri Lanka engaged in was the "Electronic Waste Management Project" implemented under the purview of the CEA. This project has been able to sign MOUs with 14 partner organizations in an effort to manage the E-waste in Sri Lanka.

The partner organizations comprised of telecommunications industry (Telecom, Mobitel, Dialog, Etisalat, Hutch, and Lanka Bell), home appliances industry (Singer and Abans), office appliances industry (Metropolitan, E-Wis, Virtusa, and ABC Trade & Investments), and service providers (Geo Cycle and Green Link).

This research project was conducted to investigate the extent of public attentiveness, attitude and practice on E-waste management in urban and rural communities in Sri Lanka. The knowledge generated through the research project aims to contribute to the decision making process and design and implementation of effective E-waste management techniques in the country.

2. METHODOLOGY

This research project was carried out in several steps. Firstly, a comprehensive literature survey which was mainly based on the publications of CEA was conducted to understand the current knowledge and practices on E-waste management in Sri Lanka. Secondly, a well structured questionnaire was developed to assess the awareness and usage of electronic equipment in the household in selected urban and rural areas. A pilot survey was carried out in the neighborhood of the university premises in order to justify the content of the questionnaire and to ensure the feasibility of the application of the method and to do any required improvements prior to the actual survey.

The questionnaire survey was conducted in four areas based on the amount of E-waste generation records collected from CEA library and discussing with the responsible government bodies. Consequently, Galle, Colombo, Kuruvita (Ratnapura) and Katukithula (Nuwaraeliya) were selected as research areas. . Four areas were again categorized as rural and urban in order to compare the awareness and attitudes of the residents towards the electronic waste.

The questionnaire survey was conducted by face to face interviewing from villagers from the selected areas. The data was collected on amount and type of electronic items that are currently using, method of disposal, knowledge and attitude on managing the E-waste and minimizing the health and environmental issues related to E-waste.

The collected data was then analyzed using univariate data analysis techniques with the support of Microsoft Excel 2014 software package.

3. RESULTS

Data analysis was conducted in two stages. Firstly, the gathered data were categorized as urban and rural.

Secondly, the gathered data was again categorized based on the age groups. Finally, the results obtained for each question of the questionnaire survey was analyzed to understand the extent of usage of E-waste sources, peoples' attitude and attentiveness on the different types of E-waste management strategies in urban and rural communities.

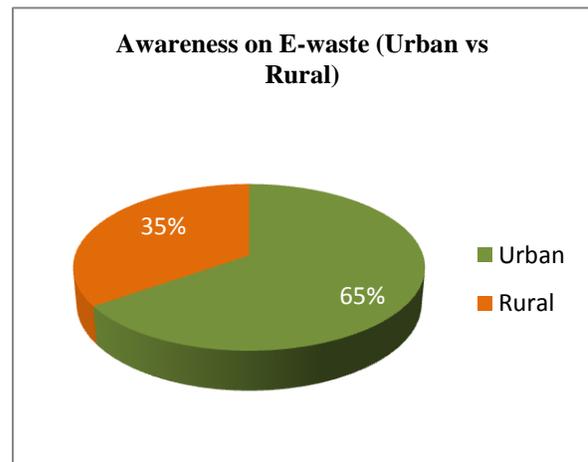


Figure 1: Awareness on E-waste

Figure 1 shows the awareness on E-waste of the people in urban and rural communities. As can be seen in Figure 1 urban population is more aware about E-waste. This can be attributed to the fact that the difference in the education level and the social and technological exposure in population in urban areas compared to the rural areas.

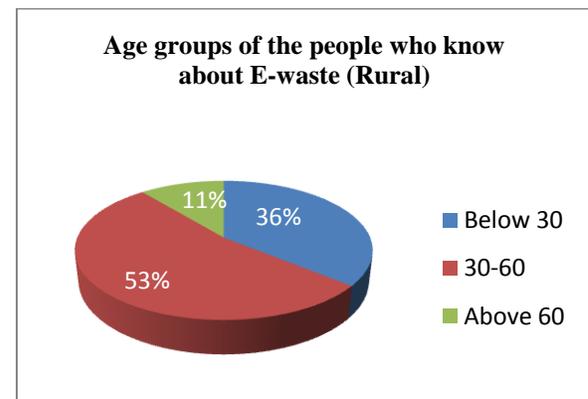


Figure 2(a): Age groups (Rural)

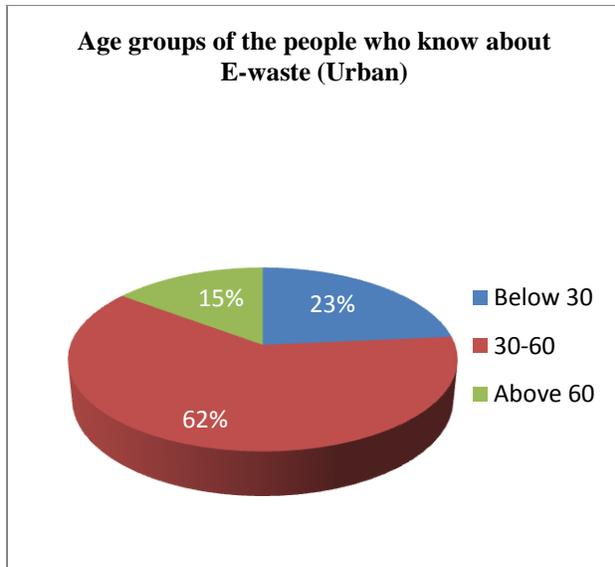


Figure 2(b): Age groups (Urban)

As can be seen in Figure 2(a) and 2(b) among both urban and rural populations, the awareness on disposal of E-waste is highest in the 30-60 age group which can be considered as the more matured and exposed age group to current socio-economic environment of the country.

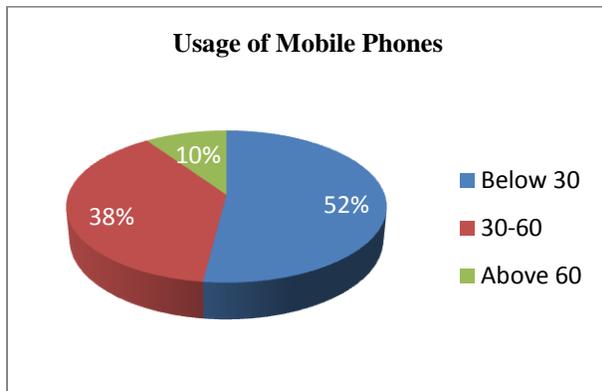


Figure 3: Use of mobile phones

According to Figure 3 it can be seen that the below 30 age group has the highest usage of mobile phones irrespective of the urban and rural communities. However, as seen in the Figure 2(a) and 2(b), the awareness on E-waste management of this age group is low. This highlights the need of education and motivation for this age group on E-waste management practices.

According to the Figure 4(a) and 4(b) it can be depicted that in both rural and urban populations, people who are aware on E-waste are willing to

support the implementation of E-waste management practices such as giving their E-waste to E-waste collectors.

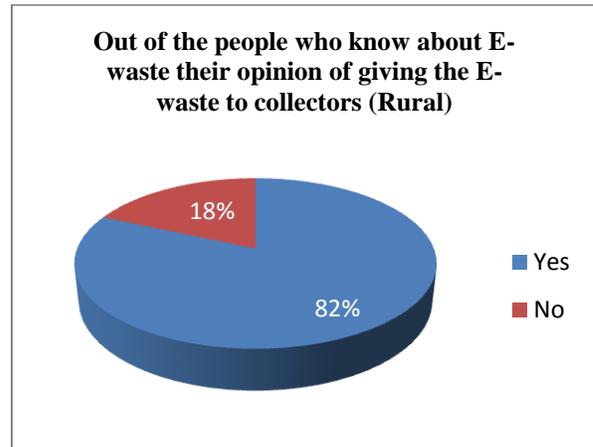


Figure 4(a): Opinion on giving E-waste to collectors (Rural)

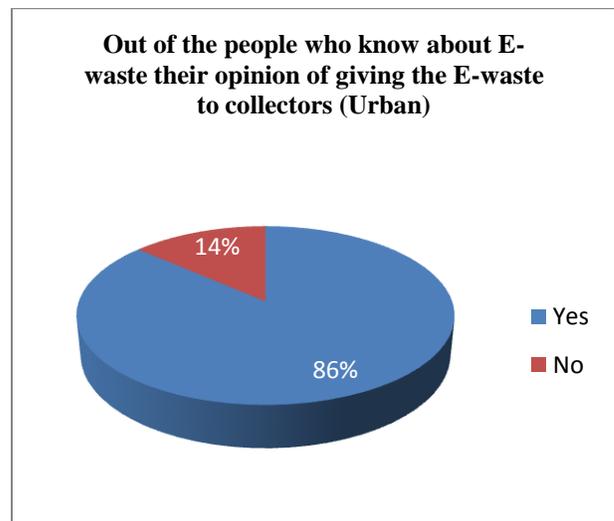


Figure 4(b): Opinion on giving E-waste to collectors (Urban)

As can be seen in Figure 5 urban population use their electronic equipment for a shorter period of time when compared to rural populations since they tend to switch to newer electronic equipment with the advancement of new technology.

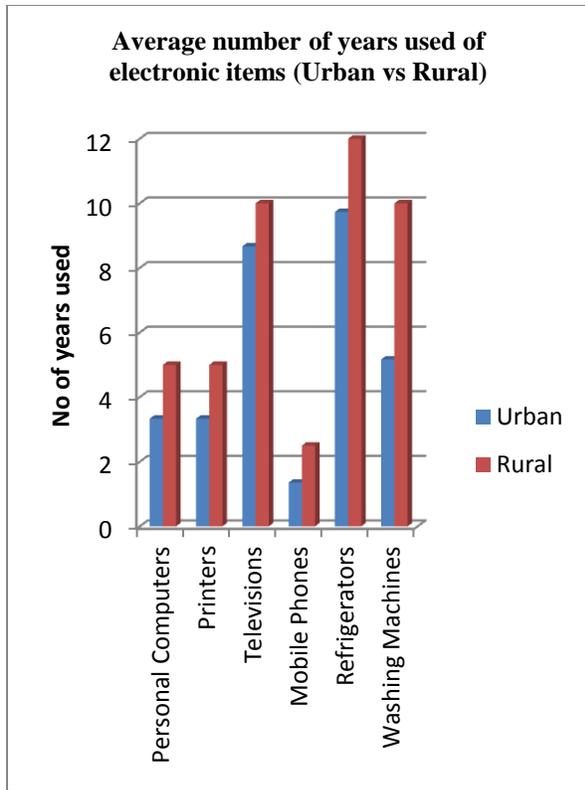


Figure 5: Usage of electronics items

As shown in the Figure 5 in both urban and rural populations, usage of televisions and refrigerators are higher compared to the other types of electronic devices considered. Furthermore, in an urban house a television is used for 8.6 years on average. When projected for year 2030, approximately 3 televisions will be disposed from each household. This indicates the need of increased awareness and attitude on E-waste management practices among both urban and rural populations.

As shown in the Figure 6(a) and 6(b), rural population do not dispose their electronic equipment that are out of order but keep it stored at home, while urban population throw their electronic equipment to the bin due to the lack of space. This suggests the consideration of these differences in the household waste management practices between the urban and rural population in the implementation of E-waste management strategies.

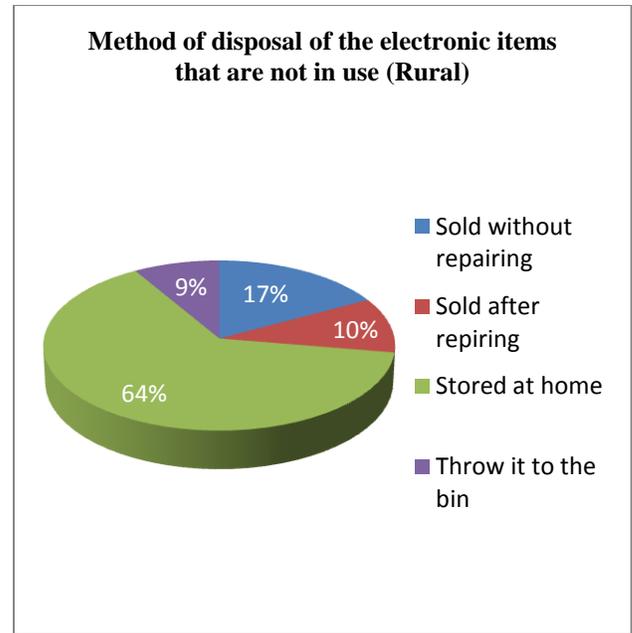


Figure 6(a): Method of disposal (rural)

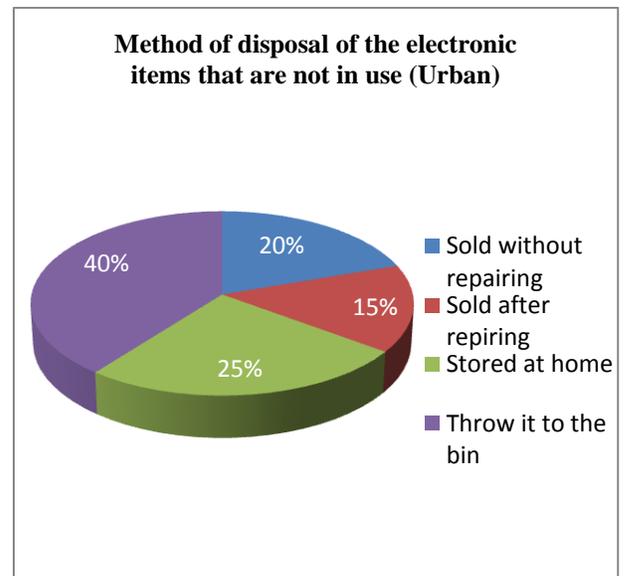


Figure 6(b): Method of disposal (urban)

According to the respondents, although there are lesser number of formal collectors in the rural areas, as shown in the Figure 7 they tend to give their collected E-waste to informal collectors as they are not aware about the formal collecting companies such as Abans, Singer, Dialog, Mobitel etc. Even though rural population tends to give their E-waste to informal collectors, companies such as Singer and Abans play a considerable role in the E-waste management.

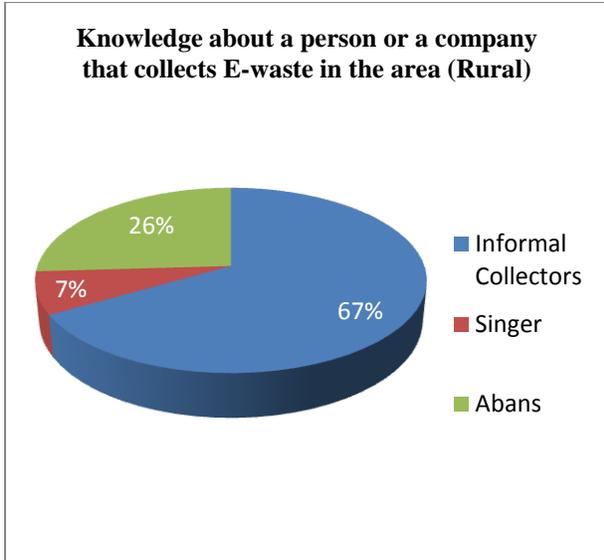


Figure 7 : Knowledge on E-waste collectors (Rural)

Comparatively, number of formal collectors in urban areas is higher than that of the rural areas. According to Figure 8, as for the formal collectors urban population is more aware about Singer, Abans and Dialog since they contribute more towards the E-waste management.

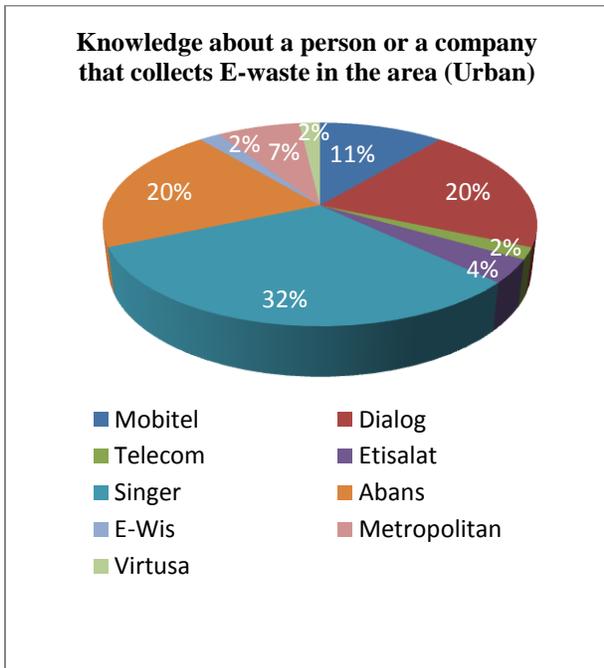


Figure 8 : Knowledge on E-waste collectors (Urban)

As shown in Figures 9(a) and 9(b) people in urban populations do not wish to take their E-waste to formal collection centers on their own due to their

busy work schedules while people in rural population have a lot of spare time to take their collected E-waste on their own. This indicates the difference in the peoples' attitude and commitment on E-waste management between the urban and rural populations. Consequently, this further strengthens the need of consideration on these differences in the attitude, commitment and awareness on E-waste management in the implementation of E-waste management strategies effectively.

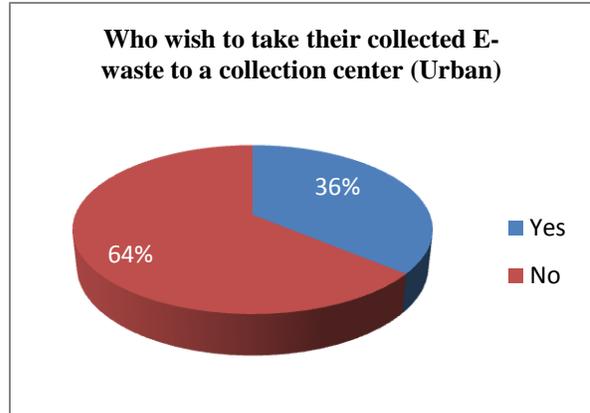


Figure 9(a) : Peoples' perspective on E waste management (Urban)

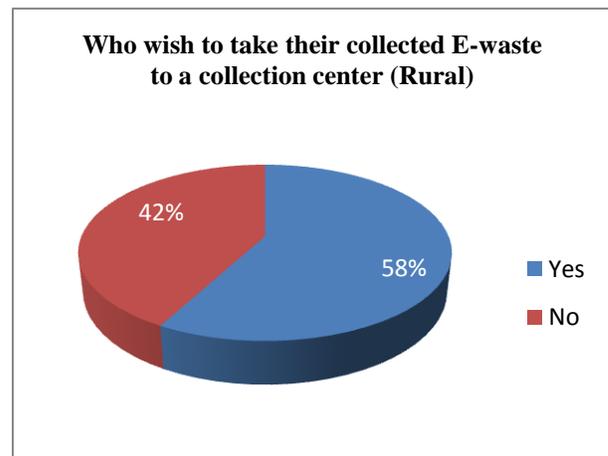


Figure 9(b) : Peoples' perspective on E waste management (Rural)

4. CONCLUSION

This research has been able to provide an indication of the current household electronic waste management practices in urban and rural areas of the

country and the peoples' attitude and perception on the E-waste management techniques.

Urban populations are more aware on the E-waste management techniques compared to rural populations. Although urban populations are more aware, they generate the highest amount of E-waste among the researched areas. This can be attributed to the major constraint which is the lack of support and facilities from the responsible authorities.

The authors would like to suggest, to target the rural populations and the below 30 age category of both rural and urban populations when conducting E-waste management awareness campaigns and other public awareness programs.

Furthermore, most of the people are willing to support the implementation of proper E-waste management and disposal strategies in the area because most of them would like to manage E-waste if they get enough support facilities. This implies the regulatory authorities about the feasibility of implementation of proper E-waste management strategies in the country if the necessary financial and technology requirement can be satisfied. However, it is also important to consider the difference of peoples' attitude and willingness to commitment between urban and rural population when design and implementation of E waste disposal and management strategies. .

5. REFERENCES

[1] L P Batuwitige, *"The report of outcome of the study on "Development of a National Implementation Plan for Electrical and Electronic Waste Management in Sri Lanka,"* Ministry of Environment and Natural Resources, 2007.

[2] M.B. Samarakoon, *"A Review of Electrical and Electronic Waste Management in Sri Lanka"*

[3] C. Rodrigo, *"Utility Vs. Environment: Sri Lanka's policy outlook on managing E-waste,"* Institute of Policy studies, Sri Lanka, June 2013.

[4] Status Report on E-waste Management In Sri Lanka. *Central Environmental Authority*, August 2010.