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Author: Dr. Thesara V.P. Jayawardane

University of Moratuwa, Sri Lanka

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# RECYCLING AND WASTE MANAGEMENT PRACTICES ADOPTED BY THE SRI LANKAN ENTREPRENEURS

Dr. Thesara V.P. Jayawardane

*Department of Industrial Management, University of Moratuwa, Sri Lanka.*

*thesaraj@uom.lk*

## **ABSTRACT**

According to the United Nations environment programme, about 280 million tonnes of waste is produced globally each year and only a very small percentage is recycled. According to the waste management authority and the central environmental authority, Sri Lanka generates 7000 metric tonnes of waste per day with the capitol city Colombo, accounting for nearly sixty percent of waste generation. Waste management presents practical management challenges for the Sri Lankan government. The need for better waste management has become increasingly obvious with the rise in population. The objective of writing this paper is to identify the current practices related to the various waste management techniques adopted by the Sri Lankan entrepreneurs, as well as recognise the various barriers they face in doing so. The next objective is to provide some suggestions and recommendations to improve the waste management practices followed by these entrepreneurs in Sri Lanka. Further, this paper will examine the role of Sri Lankan entrepreneurs in waste management in terms of the emergence of numerous entrepreneurial firms working to making a profitable business out of conserving and returning resources. This paper is based on secondary research. Existing reports related to waste management and recommendations prepared by engineers, academics, planners, charitable

organisations, consultants, ministries of the government and key industry experts are studied and analysed. This paper recognises that these Sri Lankan entrepreneurs will not only build social capital and create environmental awareness in Sri Lanka, but also will contribute to the development of the country.

Keywords: Sri Lanka, Recycling, Waste Management, Entrepreneurs

## **INTRODUCTION**

Entrepreneurship is identified as the generation of an idea and culminates in realization of the project objectives (Archer et al., 2009). Entrepreneurship in waste management contributes to environment protection, economic restructuring and job creation. Entrepreneurial activities in waste management are observed in the areas of waste collection, handling, sorting, storage, transport, transformation and energy recovery. Entrepreneurs can not only invest money in waste management sector, but also infuse new ideas, technologies and skills which can transform waste from being a liability into an asset. Involvement of the entrepreneurs will certainly increase the efficiency of waste management (National Strategy for Solid Waste Management, 2002). Entrepreneurial projects related to waste management can be seen in sole proprietor

ventures to large-scale projects involving many skilled and unskilled workers. Waste management is a labour intensive process with plenty of opportunities to generate new jobs and such entrepreneurial involvement include waste collection, transportation, reuse and recycling, upcycling and power generation. According to the World Bank, Sri Lankan municipalities spend 20 to 50 per cent of their annual budget on waste management, but only less than 60 per cent of waste is collected and less than 50 per cent of the population has access to municipal waste collection services (Colombo Environmental Improvement, 2003). Entrepreneurs contributing to waste management should realise that it indeed requires ample amount of resources. Constant flow of revenue is needed to make these waste management projects sustainable. As individuals who are working towards sustainable waste management and environmental protection, they must recognise this and act accordingly. Thus, entrepreneurs must sought revenue from payments made for services offered or through funds from national and international governments, corporate, philanthropy and other welfare organizations under various programs.

### **Research Problem**

Sri Lanka, being a developing country, is faced with the major challenge of improving its inadequate and unsustainable waste management systems. Sustainable development is a global objective to overcome the economic, environment and society disasters around the world. Therefore, a major requirement has arisen for research to be developed in order to create project ideas for social and environmental entrepreneurship to contribute to the creation of a waste management system which will become a sustainable entrepreneurial development.

Waste management is an obligatory function of all the local authorities in Sri Lanka such as municipal councils, urban councils, and pradesiya sabhas (Fernando, 2006). With the rapid pace of urbanisation, the situation is becoming uncontrollable with time. This research aims to find the relationship between sustainable development, entrepreneurship and waste management. The key requirement of this research is to create awareness transmit a genuine cultural orientation towards sustainable behaviour in waste management.

### **Objectives**

To identify the techniques adopted by the Sri Lankan entrepreneurs in maintaining sustainable waste management.

To examine the key issues faced by the Sri Lankans entrepreneurs related to sustainable waste management in Sri Lanka.

To specify methods that will improve the waste management practices followed by the Sri Lankan entrepreneurs.

### **LITERATURE REVIEW**

Around the country, especially in the Colombo District, one may see how waste accumulates without being properly disposed. You will literally see garbage bags simply lying around in front of walls, at the corners of streets, clogging drainage channels, and in many empty lands as piles. Dengue is one of the most common fatal diseases carried by mosquitoes that are bred in the mountains of empty tins, coconut shells and scattered plastic bottles filled with rainwater. Flies move in dozens in the piles of organic waste mixed in with household and industrial waste. Since there is no proper mechanism for waste collection, people tend to leave their garbage in bags in front of their house. This invites scavenging by animals and the

scattering of garbage everywhere. "Due to a lack of sufficient land and resources, as well as poor planning and erratic service, most of the waste in the country is unmonitored and is disposed of into unmanaged dumpsites in wetland areas, and along the roads, streams and rivers resulting in leakage of toxins into drinking water. Open burning of mixed wastes is common in both rural and urban settings, contributing to poor air quality and a number of health concerns. Haphazard wild dumping is the most commonly practiced means of waste disposal." (Pilapitiya, 2006). "The government structure of Sri Lanka is divided into National level (the President, Parliament, Ministries and connected departments, etc.), Provincial level (headed by the Provincial Councils), District level (headed by Government Agents), Division level (headed by Divisional Secretaries), Pradeshiya Sabhas, Municipal and Urban Councils, and the Grama Seva Nildaris which generally have a Public Health Inspector assigned to them and who is responsible for solid waste management. The Ministry of Forestry and Environment and the Central Environmental Authority are responsible for solid waste management policy making." (Van Zonn, 2000).

A National Waste Management Strategy has been drawn up and legislation enacted to effect sustainable solutions to the waste issues in the country. However, implementation has fallen short (Pilapitiya, 2006). Local authorities (Urban Councils and Pradeshiya Sabhas) are responsible for the collection and disposal of solid waste. Currently household, industrial, medical and other wastes are all being disposed of together without precautionary measures (Van Zonn, 2000).

Many charitable organisations and non-governmental agencies do contribute to the public and environmental health of Sri Lanka. The Central Environmental

Authority which is funded by such foreign organisations works with the government, to find and implement solutions to the sustainable waste management.

In this research, literature on Sri Lanka, Malaysia and Singapore was investigated and compared in order to get a sense of the waste management in countries facing challenges similar to Sri Lanka. Singapore faces similar challenges as far as population and limited land but has access to resources and technology that have enabled it to implement innovative, expensive solutions that can provide insight into what might be possible in the future for Sri Lanka.

A few years ago, open dumping type landfills were the only type of landfill available, but there are now newly developed sites using modern technologies to reduce environmental pollution caused by leachate and gas emissions. Thus entrepreneurs must encourage the involvement of foreign environmental companies to manage the waste issue in a sustainable manner. Landfill gas harvesting and recycling are emerging businesses around the world. According to ISA (2003), Korea has installed 100 methane gas extraction wells into an existing landfill site and uses the captured gas to heat and cool neighbouring households and businesses.

"Sri Lanka has implemented numerous solid waste management projects over the past ten years, with some degree of success but, without a significant shift in the situation. It would appear, actually, that the situation is worsening as the country continues to develop economically" (Bandara, 2003). In addition, "Country wide sustainable waste management infrastructure is weak, equipment is old and ill maintained, absenteeism is extremely high among municipal waste collectors, and resources that are spent are often misspent on duplication of efforts or corruption (Pilapitiya, 2006).

Sri Lanka is facing the challenge of lack of financial and human resources to obtain and implement expensive technologies, and has a shortage of skilled experts. Literacy rate in Sri Lanka is extremely high but the graduates are completing higher education without gaining necessary amounts of practical, applicable skills and experience (Gunawardena, 2006). Well-written, progressive reports are generated and published but do not get implemented.

## **METHODOLOGY**

The research was done mainly with secondary data obtained from materials from existing reports related to waste management and recommendations prepared by scientists, engineers, academics, planners, charitable organisations, consultants, ministries of the government and key industry experts. This research extracted, studied and analysed those data to obtain the necessary information on entrepreneurs of Sri Lanka and sustainable waste management.

Additionally semi-structured interviews and environmental education and awareness building programs provided data for the inquiry. This research was qualitative in approach and employed formal and informal interviews, focus groups and questionnaires. Data obtained from a survey research was also extracted and analysed for the purpose of this research. The standardized five point's Likert questionnaire which was used by many researchers with a proven reliability and validity was used in order to respond to the research after the review of related literature and scrutinizing documents and library sources. The questionnaire contains 15 components in which 3 components related to the general demographics of the entrepreneur and 12 components related to sustainable waste management.

Out of that data-base population consisting two hundred (200) interviews and case studies, twelve (12) entrepreneurs were chosen from convenience sampling. Convenience sampling is useful where it is otherwise difficult to elicit a sufficient level of response (Bell and Bryman, 2007). These selected entrepreneurs represented the key characteristics and attributes of the total sample group. They were interviewed face to face at a location of their convenience with similar questions that were raised in the data base interview. They elaborated the responses given in previously to provide a wider understanding to the researcher. All these entrepreneurs shared their experiences with the researcher in terms of garbage disposal, waste reduction, reusing of plastic bottles and bags, recycling of glass, plastic and metal, and composting. Participating entrepreneurs were encouraged to form their own environmental task force responsible for upholding the commitment of environmentally sound waste management in their communities.

### **Validity and Reliability**

Results were also presented for the respondents to see if the answers have been interpreted correctly. Furthermore, the validity of the result has been discussed with the supervisors, academic consultants, experts of the industry with valuable feedback. Cross checking of the information was done with the aid of industry experts and professional bodies.

In terms of reliability measurement repetition of the study was conducted. Randomly selected few respondents were asked to do the interviews again with a third person. This was done in order to see if the same results were to be obtained. Because of the lack of time, it was not possible to conduct the study more than once for all the respondents. But the

chosen sample reiterated that the findings or the answers were more or less identical.

## **KEY FINDINGS**

The research reviewed the existing literature to understand and relate the waste management practices adopted by entrepreneurs of Sri Lanka. It was also analysed to identify if these practices are meeting the techniques and standards of the comparative countries. During the research it was understood that the Sri Lankan government and local authorities do take part actively in tackling the waste management situation but when compared to countries such as Singapore or Malaysia that are well streamlined and established, there is a gap existing.

Key issues faced by the entrepreneurs

This is a brief summary of key issues faced by the Sri Lankan entrepreneurs related to waste management.

### **Health and environmental issues**

Waste management certainly impact the health and wellbeing of people's and the environment in general. Unplanned and illegal waste dumping creates breeding grounds for various pathogens and other harmful organisms, and exposes people to chemical and mechanical hazards in case of hazardous waste. By polluting the ground, the surrounding air, and water will spread diseases and enhances exposure to harmful chemicals beyond the immediately affected areas. Non-composted organic waste, by its anaerobic decomposition, contributes to greenhouse gas emissions (Solid Waste Management in Sri Lanka, 2007).

### **Technical issues**

- Waste treatment and disposal

Waste, in many (planned and unplanned) areas is frequently just dumped along the wayside, in drainage channels and other water courses. In Sri-

Lanka, the highest proportion of waste consists of potentially compostable, and thus valuable, organic waste. Illegal dumpsites, unmanaged and without the minimally required lining and fencing, and equally unmanaged company dumpsites contribute to environmental and social degradation. In many places, municipal authorities have set up large scale mechanised collection systems, using skip buckets or containers at selected transfer stations without, however, coming to grips with the neighbourhood-level waste management.

Entrepreneurs should promote the three-R strategy of Reduction, Re-use, and Recycling (Solid Waste Management in Sri Lanka: Policy & Strategy, 2007).

### **Collection**

Municipal authorities do the collection but it is not simple as collecting waste from transfer stations using expensive trucks, skip buckets, and containers, but instead the entire transport chain from the household level upwards needs to be studied. Can the entrepreneurs contribute or take initiative for transport taking place between the household level and the transfer station and make the process be better regulated, recognised, safe, effective and efficient? Can they encourage their employees to become a part of a socially and economically valuable operation?

### **Institutional and organisational issues**

The various skills and activities required by the entrepreneurs and their respective employees has become an issue when it comes to sustainable waste management. The requirement of formal contracts and licensing agreements, creation of these and implementing has become a key issue. The procedures to follow to be aligned with the financial institutes and government bodies also come as a key issue to these entrepreneurs.

### **Legal, political, and policy issues**

Solid Waste Management in Sri Lanka (2007) states, “governance can be described as the manner in which public and private actors in society interact, democratically and transparently, and the general state of the urban environment is widely regarded to be an excellent indicator of the state of governance. Hence it is safe to assume that in a specific sense, governance means the manner in which laws and regulations structure the waste management policies and laws. But, governance mostly is an intensely political process focusing on power relationships between actors and sector in society and waste management is no exception. Therefore it is vital for the entrepreneurs to understand the manner in which politicians and political candidates value the importance of waste management in their constituencies in order to make it a sustainable venture. It is also essential to realise that the development and sustainability of community-based waste management is better than any formal licence or agreement.

### **Financial and economic issues**

When actively involved in sustainable waste management, the entrepreneurs come across various financial and economic issues. These include analysis of annual budgets, audits, reports, and minutes of the municipal council related to waste management, municipal fee schedules, subsidies, and the political basis for them, permits, fines, and sanctions, taxation policy and records, capital and operating cost as well as recycling proceeds.

### **Socio-cultural issues**

The manner in which people perceive their environment, and the manner in which waste is perceived, is closely related to their cultural background (Ghosh,

2000). Entrepreneurs located in the heart of Colombo, where densely packed, fast growing, slums are present, find it hard to convince the others of sustainable waste management and make it effective.

## ***DISCUSSION***

Below described are various methods found during the research, which will improve the sustainable waste management techniques followed by Sri Lankan entrepreneurs.

### **Institutional responsibilities**

Even though the waste management is an obligatory function of all the local authorities in Sri Lanka, which includes the municipal councils, urban councils, and pradesiya sabhas, the service they perform in waste management is so poor, which results in problems of health, sanitation and environmental degradation. The entrepreneurs must take action to promote and contribute towards sustainable waste management.

There is an increase in the country's urban population at the rate of 2.5% which is far ahead of the annual population growth rate of 1.5%. With this rapid pace of urbanization, the waste management situation is becoming uncontrollable for entrepreneurs. There needs to be improvement in institutional weaknesses, social responsibility and environmental accountability of each citizen, means to fund for inadequate financial resources, improve technical competency, and create public apathy towards waste management, in order for entrepreneurs to contribute satisfactorily towards this cause.

### **Waste composition and volume**

The total municipal solid waste generated in the country is assumed to be around 6,900 tonnes per day but the daily waste collection by local authorities is only 2700 tonnes. According to the available data, waste composition in Sri

Lanka consist of 62% biodegradable waste, 6.5% of paper, 6% polythene and plastic, 6% of wood 2% glass (Colombo Environmental Improvement, 2003). Therefore, it is safe to assume that the average Sri Lankan municipal waste consists of a large proportion of compostable material.

### **System issues**

The waste management practices in Sri Lanka needs a proper technique. Initially, the sorting of waste needs to be more methodical. Domestic, trade and institutional waste including hazardous biomedical/healthcare waste and industrial waste are also disposed mixed with municipal wastes. Garbage is thrown on the streets, footpaths, drains and water bodies treating them as receptacles of waste. Recyclable waste material is also not segregated at the source and is disposed of along with the domestic, trade and other waste.

Construction and demolition wastes also pose serious problems as this waste is deposited on the roadside or open spaces, obstructing traffic and causing nuisance (Solid Waste Management in Sri Lanka, 2007). General public continuously speak ill of the system but do not contribute for handling their waste social responsibly. Since most waste that is found everywhere has resource recovery potential, waste cannot be considered useless. Therefore, entrepreneurs must treat waste at all times as a commodity that has an economic value.

### **RECOMMENDATIONS**

The key issues found the entrepreneurs faced while sustainably managing the waste in Sri Lanka and the ways to improve their techniques were discussed above. The following are the recommendations this research presents in terms of methods that will improve for an

improved and efficient waste management by entrepreneurs in Sri Lanka.

#### **On waste disposal**

- Community and neighbourhood level recycling and composting activities, as much as possible reducing and re-using waste at the source.
- Transfer stations, waste separation facilities, disposal sites and sanitary landfills, to create minimum health and environmental standards by securing and lining of landfills.
- Centralised composting facilities, to deplete nutrients by ever exploding cities.

#### **On national policy**

- Discuss the national waste management policy and strategy with relevant parties and contribute to drafting a national policy on waste management.
- Assist in analysing the institutional and legal reforms, transfer of technologies and capacity building, financing mechanisms and promotional campaigns.
- Support discussions on future of the national platform on waste management.

#### **On management**

- Waste management should be managed by entrepreneurs, adhering to the waste management hierarchy where the emphasis is on reduction of waste generation, reuse, recycling and resource recovery to the maximum extent possible, followed by appropriate treatment and finally by the disposal of residual waste.
- Adhere to national environmental standards developed under the provisions of the National Environmental Act.
- Resource maximisation should be ensured by promoting sustainable production and consumption and enforcing producer responsibility

approach throughout the Product Life Cycle.

- Partnerships to be created in order to encourage efficient and cost effective collection, transportation, storage and treatment of waste and disposal of residues.

#### **On financial mechanisms**

- Appropriate resource mobilisation strategies should be followed with sustainable financing mechanisms for waste management.

- Obtain assistance from local authorities to ensure self-financing for waste management by effective revenue generation mechanisms.

- Appropriate financial incentive schemes should be explored and established by entrepreneurs to promote waste management.

- Carbon financing could be promoted as an incentive for promoting waste management practices in line with the existing clean development mechanism policy.

#### **On legal mechanisms**

- Entrepreneurs can assist to strengthen the existing regulatory mechanisms through appropriate legal reforms.

- Support effective law enforcement in order to ensure maintaining the accountability of stakeholders.

#### **On research and development**

- Awareness, education, training and capacity building on integrated waste management should be promoted among all stakeholders, especially employees and customers of the entrepreneurs.

- Research and development on waste management, should be encouraged and promoted and funded by the entrepreneurs.

- Best environmental practices should be implemented in all areas of their respective business.

### **CONCLUSION**

Sri Lanka's current consumption, in the form of various goods, must end up in the waste stream and the responsibility is to either innovate in the field of waste management or to keep continuing the existing polluting methods of waste disposal. However, this field has lot of challenges and it takes persistence and providence to overcome them, as the root of the problem mostly lies in the minds of the people. To solve this ongoing challenge, smart minds need to come up with innovative solutions. Therefore, emerging entrepreneurs have a special task and responsibility towards this objective. An entrepreneur is one who plays significant role in the economic development of a country and the Sri Lankan entrepreneur is regarded as a person who has the initiative, skill and motivation to set up an enterprise of their own and who always looks for high achievement.

The objectives of this research paper was to identify the techniques adopted by the Sri Lankan entrepreneurs in maintaining sustainable waste management, to examine the key issues faced by the Sri Lankans entrepreneurs related to sustainable waste management in Sri Lanka and to specify methods that will improve the waste management practices followed by the Sri Lankan entrepreneurs.

The outcome of the study resulted from secondary data obtained from materials from existing reports related to waste management and recommendations. This research extracted, studied and analysed those data to obtain the necessary information on entrepreneurs of Sri Lanka and sustainable waste management.

Additionally semi-structured interviews and environmental education and awareness building programs provided data for the inquiry. This research was qualitative in approach and employed formal and informal interviews, focus groups and questionnaires. Data obtained from a survey research was also extracted and analysed for the purpose of this research.

The key issues identified by these entrepreneurs when implementing sustainable waste management were Health and environmental issues, Technical issues, Institutional and organisational issues, Legal, political, and policy issues, Financial and economic issues, and Socio-cultural issues. They were discussed in this research along with various methods to overcome the said challenges which includes Institutional responsibilities, Waste composition and volume System issues, and Justification for a National Policy. Recommendations were made for future for these entrepreneurs in the areas of waste disposal, national policy, management, financial mechanisms, legal mechanisms, and research and development.

Sri Lankans cannot wait for the government to develop solutions to sustainable waste management. They must take responsibility for their garbage and develop appropriate, community driven solutions to protect their, and their children's, lives and futures. Entrepreneurs can facilitate the necessary shift in consciousness, and behavioral change, that has so far failed to occur through other interventions. Today the situation in Sri Lanka has changed to a certain extent and several of the local authorities now indeed recognise their presence. The next stage is that it is seen that working together with entrepreneurs is much more fruitful and efficient than working in isolation of each other.

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