

The Importance of Recycling To Waste Management

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Abstract

Due to the fact that the amount of garbage produced by households is continuously growing, it is essential to carry out research projects in which recycling practices are investigated in order to ascertain whether or not recycling is a sustainable practice. The creation of garbage is one of the most significant challenges that every nation in the world faces, and waste management is an ongoing process that solves this issue. The vast majority of the research, on the other hand, concentrate on the relationship between recycling behaviors in households and either income or level of education. In contrast to this, the purpose of this study is to identify the attitudes of families regarding recycling without making any connection between such views and income or level of education. The findings of this study were gathered for the express goal of determining whether or not recycling can be considered a form of environmentally responsible trash management in Paarl. This kind of research has not been carried out in Paarl as of yet. A total of one hundred homes in a variety of residential locations were given questionnaires that were developed and disseminated. Through the use of a wide range of questions, it was discovered that attitudes and behaviors toward recycling are not yet conducive to the sustainability of recycling in Paarl until further investigation is conducted. There is, however, the possibility of achieving sustainability for recycling in the not too distant future, since more than fifty percent of the inhabitants who filled out the questionnaires expressed a willingness to take part in recycling-related activities.

keywords: Waste Management and Recycling of Materials.

I. INTRODUCTION

In order to meet the energy requirements of transportation, the manufacturing of consumer goods, and building, an excessive amount of natural resources have been required. This results in an imbalance in the ecosystem, the depletion of these resources, and changes in the environment, as well as the generation of economically and socially problematic situations. Construction is one of the activities that has a greater influence on the environment; nevertheless, it is also regarded to be one of the activities that generates more employment and revenue in Brazil.

A report published by the National Foundation Getúlio Vargas in 2009 indicates that the building sector in Brazil generates a total revenue of R \$ 224 billion and constitutes 8.3% of the country's gross domestic product. Nevertheless, it is responsible for the use of nearly 75% of natural resources, as well as 44% of the total energy consumption in our nation. Furthermore, it is responsible for the generation of approximately 40% of all trash that is created by the activities of men, which amounts to approximately 500 pounds of trash of Construction and Demolition each individual. For there to be a balance between the financial rewards made by this activity and the reduction of the harm caused to the environment, it is necessary to invest in technical innovation that is paired with sustainability.

As a result of the installation of new network equipment and infrastructure, as well as urban regeneration projects that were developed by governments in order to address issues with the quality and comfort of the environment in cities, there is a fragmentation between the new urban fabric and the current urban fabric. The physical causes for these technical and social developments, along with the economic and political tendencies, as well as concerns about the environmental sustainability, are the basis for their implementation. Because of these changes, buildings will be demolished, which will result in a significant amount of garbage from the construction industry.

Waste from construction and demolition, also known as CDW, is comprised of leftovers from all types of building materials, including but not limited to mortar, sand, ceramics, concrete, wood, paper, metals, plastics, stones, bricks, paint, and so on. This waste is generated during construction projects, restorations, and demolitions. In recent years, there has been a growing concern over the recycling of these wastes; nevertheless, this method has been utilized since ancient times in the cities of the Roman Empire. In these cities, demolition materials were recycled and used as aggregate in the construction of new buildings.

By the year 1860, Germany had already recycled cement concrete blocks into artifacts. However, applications did not become essential until the conclusion of World War II, when Europe was confronted with the destruction of the majority of its structures and a shortage of construction materials throughout the continent. Since that time, European nations have been doing more study on this topic in order to get recycled aggregates of a higher grade, which are more resistant to compression and more long-lasting.

With the rise of industrialization and population growth in the middle of the 1980s, particularly in urban centers, the residues of construction became a major social and economic problem. This is due to the fact that the amount of waste has significantly increased, which has resulted in a scarcity of deposition area, problems with public sanitation, and environmental contamination. The process of recycling was first implemented in Europe in the year 1950, but it wasn't until thirty years later that it was implemented in Brazil. This resulted in a significant delay in the development of technology and the implementation of this process in our nation. Our experiences are restricted to municipal efforts that try to decrease expenses and environmental effect. We do not have any concerns regarding the knowledge of the public or industries that are accountable for the garbage.

With the exception of cement and steel, this topic is still more prevalent in the scientific community in Brazil than it is in its practical application. Cement is the industry that recycles the most goods from the construction sector. At the moment, Brazil is the first country to implement the practice of co-processing, which involves the burning of trash in cement kilns. This practice helps to reduce the amount of waste that is disposed of in landfills and the amount of energy that is consumed. As a result of the fact that a significant portion of the steel composition of the concrete that is produced in the nation is nearly entirely composed of scrap, the steel sector is another significant recycler.

During this presentation, two examples of successful projects involving the recycling of building waste from recycling facilities will be discussed. The first one will be on the program of Correction Provisions Boyz and Recycling Rubble that is being carried on by the Municipality of Belo Horizonte. This program is one of the first Brazilian experiences that is targeted at the appropriate management of these leftovers. This case has garnered a lot of attention both in the country and globally, and it has been recognized with a number of prizes. It has also been widely covered in scientific publications and in television news shows, and it has become a model that many other countries are attempting to emulate.

There are already two recycling plants of CDW 23 Units Receive Small Volumes of Debris that are part of this program, and a third plant is currently in the process of being implemented. Reclamation and assistance for waste transporters are two complimentary acts that are included in this program. Additionally, this program provides advice and supervision to the agents that are participating. A number of advantages have been acquired by Belo Horizonte as a result of these facilities, including a reduction in the expenses incurred for the management of the CDW and the purchase of materials for the construction of new municipal facilities.

The second illustration is the Model Private Waste Management of building in California which is an ecological park that was developed by Raisch Products Company and is dedicated to the reuse and recycling of demolition and building waste. The business merged with other businesses, and now they handle various kinds of construction and demolition waste (CDW) at the same location. These CDW are then sold to local contractors at a reduced price. In addition to these advantages, there are a variety of community services, such as the reduction of trash, the provision of training and job placement, the rehabilitation of drug addicts and juvenile criminals, and the creation of educational programs.

Information and Recycling Behaviour

Despite the fact that the "individual" has been called into question as a unit of analysis in recent times, the "individual" continues to be the single most important factor in determining whether or not an individual would engage in a recycling program, regardless of the circumstances. As a consequence of this, the "individual" is free to exercise their own personal discretion on the decisions they make regarding whether or not to engage in environmentally conscious actions, taking into account the many elements that contribute to the decision-making process. There are a variety of elements, including demographics, socioeconomics, scheme design, and identity, that have been highlighted in the past as having the potential to impact recycling behavior. Although these elements have been identified in detail in the research that has been done on recycling at home, the factors that influence recycling at work (as well as in other contexts) are still not well understood. Despite the fact that there is no guidance on the components or how to build a communication plan, it has been recorded that the relevance of information on recycling systems in increasing public engagement has been highlighted. As an instance, it was noticed that having sufficient knowledge about what to recycle through the supply of recycling information and feedback was positively significant to recycling behavior at home. The results of a research that was quite similar to this one indicated that publicity and promotion had a beneficial impact on the recycling behavior of households. Additionally, the study found that there was a positive correlation between recycling awareness and the recycling behavior of households. In light of this, it appears that information on

recycling, whether it be in the form of feedback, publicity, promotion, or a communication plan that has been thoughtfully crafted, is a powerful tool for engaging individuals and improving their recycling behavior at home.

However, it has been observed that behavior returned to the baseline level not long after the intervention was discontinued, which suggests that there were inconsistencies in behavior over a considerable amount of time with the intervention. However, there is a lack of knowledge on the elements that are likely to encourage recycling at work, despite the fact that the factors that influence recycling at home have been extensively established and recorded. Nevertheless, research has been done in the past to study the impact that knowledge has on recycling policies at the workplace. It appears from the findings of these research that knowledge has a significant impact on the manner in which recycling is carried out in the workplace. It is therefore possible for information about recycling initiatives to act both as a motivator and a barrier to recycling, not just at the workplace but also at home.

Despite the fact that research has sought to relate recycling success to the information that is now available on recycling, there is no known study that has defined how and in what format this recycling information should be delivered, including the frequency at which it should be presented. Therefore, providing detailed information on what (recyclables and non-recyclables), where (location of recycling containers), and how to recycle would be beneficial in terms of encouraging environmentally responsible behavior. Despite the fact that the effect of information is mixed and thought to be behavior-specific, it is possible that it can separate those who are believed to recycle from those who are not considered to recycle. Furthermore, the significance of a well-designed information to the involvement in recycling is sometimes overlooked, and our current expertise regarding the manner in which information on recycling need to be structured and presented is currently inadequate. This comprises information that is pertinent and significant regarding the recycling process, the recycling scheme, and the collection of recycling facilities that are available and have the potential to stimulate recycling. Consequently, it is necessary to have an awareness of the actions that result in the generation of trash (by means of comprehensive information on the dynamics of waste, beginning with the manufacturing of materials and ending with their consumption). The purpose of this research was not just to improve scheme design but also to encourage citizens to recycle with greater frequency.

OBJECTIVES

1. In order to conduct research in order to ascertain the number of residents who recycle or the proportion of those who do so.
2. To conduct research in order to better understand the factors that contribute to people's lack of recycling.

II. RESEARCH METHODOLOGY

In this research, which is a review of the literature, secondary data played a significant role, as is the case with the majority of desktop studies, which make use of previously collected material for the purpose of analysis and drawing important findings. The research draws its information from a variety of sources, including but not limited to books, journal articles, unpublished studies, government reports, private and organizational websites, and private and organizational websites. In situations when a significant amount of work has already been done on a research issue and where the purpose of the study is to answer particular questions based on past works, this sort of research technique is utilized. As a result of these factors, the current work made use of this methodology in order to investigate the ideas that many academics have expressed regarding wastes, their classification, and their management.

Because the questionnaires that were given out to residents provided a clear idea of their opinions on recycling, their knowledge of recycling activities, and their attitudes towards recycling, a quantitative survey proved to be the best research design for this particular study. This is because the questionnaires did not link it to income or level of education, as was explored in the majority of the previous studies. For the purpose of making analysis more straightforward, respondents were asked closed-ended questions.

III. DATA ANALYSIS

There were a total of 220 persons living in the 70 houses that took part in this research project. This figure was determined by totaling up all of the people who lived in each household, as declared by the participants in the questionnaire's question titled "number of people in household."

Taking part in the recycling process

Figure 2 illustrates the first question that was asked in the questionnaire, which was about whether or not households engage in recycling activities.

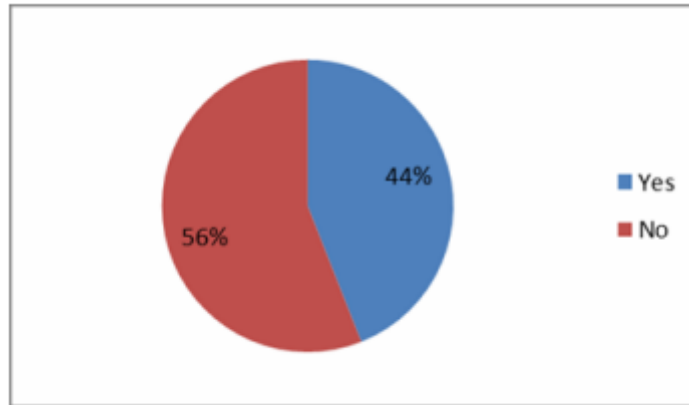


Figure 2: Percentages of households that do and do not recycle

39 homes, or 44%, said that they do participate in recycling activities, while 39 households, or 56%, reported that they do not participate in recycling activities.

Motives for not recycling materials

It was requested of the 39 families that had previously indicated that they do not recycle that they provide an explanation as to why they do not recycle. The varied options was presented as reasons for not engaging in recycling a s may be illustrated in Figure 3 below as percentages on a pie chart.

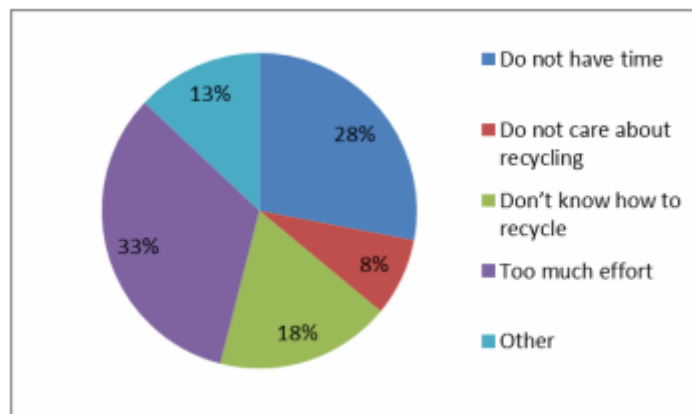


Figure 3: Reasons for not recycling

There were eleven families who picked the option that stated they "do not have time," while thirteen households selected the option that stated they "too much effort." Among the homes who participated in the survey, seven households said that they do not know how to recycle, while three households selected the option that they do not care about recycling. The option labeled "other" was selected by five households. The families that opted for the alternative were given the opportunity to submit an explanation for their decision. Some of the reasons that were given included the fact that there were no facilities available, that there were no more recycling bins, and that they were unsure of where they could take their rubbish to be recycled.

As a result of the fact that knowing the reasons behind people's decisions to engage in recycling or not offers a sense of their attitudes towards recycling and suggests opportunities for development, this question constitutes a very essential component of this study. The problem can be solved after it has been identified as such. It is concerning that the majority of families that do not recycle have stated that recycling requires an excessive amount of work (13 out of 39 households' responses). This demonstrates that people have a negative attitude about recycling, and it is highly probable that recycling will continue to be an excessive amount of effort in the future unless measures are taken to make recycling even simpler than it now is.

The reason that was selected as the second most common cause for not recycling was that families claimed that they do not have the time to recycle (for eleven out of the thirty-three homes). Sixth, there are a lot of people who do in fact have extremely busy work schedules, and when they get home, they might not want to deal about things like recycling. The simpler choice for them might be to just rid of all of their waste together. This is another significant problem that arises when it comes to recycling promotion. Even though only seven out of the 39 houses gave this response, it is still 18% of households that may be persuaded to engage in recycling if they are genuinely aware of how to recycle. This is despite the fact that some of the households said

that they do not know how to recycle. This does not imply that they have negative sentiments toward recycling; rather, it just indicates that they are not knowledgeable about how recycling operates. It is possible that this issue may be resolved more simply than issues involving those who believe that recycling requires an excessive amount of effort or those who do not care about recycling at all, as three of the 39 homes have mentioned. In this particular scenario, the number of homes that do not care about recycling is rather low, and in the present time, this is not a very significant concern. It is nonetheless something that ought to be taken into consideration. Another reason that participants indicated for not recycling was that they were asked about it.

IV. CONCLUSION

As part of this exercise, we will examine the current state of waste management practices in India, as well as the consequences these practices have on public health and the environment, and we will also consider the possibility of adopting more effective methods of disposing of solid waste in India. Recycling, composting, anaerobic digestion, incineration, and land filling are some of the ways that these approaches may be utilized. The purpose of this research was to investigate and discover the many methods that are now being utilized for the disposal of the massive amount of solid waste. Composting facilities have expanded from 22 to 40 during 2008, a significant increase from the previous year. At the moment, India is home to more than 80 composting processing factories. When compared to the previous time period, the number of landfills has grown from one to eight. The remaining waste is composed of water vapour and carbon dioxide that is produced throughout the composting operations. Up to sixty percent of the input trash is thrown away as composting rejects and land filled during the composting process. Every municipality has a waste plan that addresses all different kinds of garbage and outlines the steps that must be taken in order to dispose of it in a way that is both environmentally friendly and efficient with resources. Despite the fact that they concentrate on domestic garbage as well, waste plans frequently incorporate measures for waste flows of different types. This process, which is also known as benchmarking and target setting, may be advantageous for waste management organizations since it can give valuable benchmarking data that can assist in and regulate the creation of trash.

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