National Research Journal of Human Resource Management
Volume No: 12, Issue No: 1, Year: 2025 (January-June)
PP: 123-129
ISSN No: 2349-059X
Peer Reviewed & Refereed Journal
National Research Journal

A CASE STUDY ON PLASTIC RECYCLING PLASTIC PRACTICES OF ECO -HOUSING SOCIETIES IN MUMBAI

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ABSTRACT:

Plastic recycling is a critical process aimed at reducing plastic waste, conserving resources, and minimizing environmental impact. The recycling of plastics involves the collection, sorting, and processing of used plastic materials to create new products, thereby closing the loop in the plastic lifecycle. Various recycling methods, including mechanical, chemical, and biological processes, each offer unique advantages and challenges. Mechanical recycling, the most common method, involves shredding and melting plastic to form new products, but it is limited by material degradation and contamination. Chemical recycling, on the other hand, breaks down plastics into their monomers, enabling the production of higher-quality products but at a higher cost. Despite these challenges, advancements in technology and the increasing demand for sustainable practices have led to innovations in the plastic recycling industry. Effective recycling not only mitigates the environmental harm caused by plastic waste but also contributes to the circular economy by promoting the reuse of valuable raw materials. The success of plastic recycling hinges on the collaboration between governments, industries, and consumers to improve recycling infrastructure, raise awareness, and enhance material recovery rates.

Keywords: Plastic, recycling, conserving resources, reuse, valuable raw materials, circular economy, sustainable packaging

1.INTRODUCTION:

India is facing an alarming increase in plastic trash due to its fast-expanding urban population. The enormous volumes of plastic produced have overloaded garbage handling systems, particularly in cities like Mumbai. Mumbai, a centre of culture and the economy, has a lot of problems controlling its garbage, especially plastic. Mumbai generates approximately 8000 metric tonnes of waste daily, a significant portion of which is plastic. According to Brihanmumbai Municipal corporation plastic waste accounts for around 10% of the total waste generated. The improper disposal and inefficient recycling of plastic have resulted in environmental pollution, clogging of drainage systems, and destruction of marine life.

To address these issues, some of the city's eco-housing organizations have taken the initiative. Residential communities that include sustainable principles into their planning, management, and operation are known as eco-housing societies. By reducing waste, conserving energy, conserving water, and recycling—including plastic—these cultures hope to lessen their environmental impact.

In today's world, single-use plastic has become commonplace. We employ plastic in a variety of ways. Packing materials and carry bags are the most widely used formats. It is widely acknowledged that single-use plastic poses a risk to the environment as a whole. When

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single-use plastic enters the environment, it has a negative impact on the ecology. According to a CPCB estimate, India generates 25,940 tonnes of plastic garbage every day. Plastic takes a long time to decompose and has a number of detrimental environmental effects. Plastic waste that is not collected eventually ends up in the environment untreated. Only 13,000–14,000 tonnes of the 20,000 tonnes of plastic that are produced daily in the nation are collected, according to the Environmental Ministry.

Waste made of plastic is well known for its detrimental effects on the environment and lack of biodegradability, especially in metropolitan settings. Examining plastic recycling is necessary since plastic waste is so common. Plastic recycling is crucial for several reasons, as it plays a key role in addressing environmental, economic, and social challenges caused by plastic waste. Here are the main reasons why plastic recycling is important:

1. Reducing Environmental Impact

- **Mitigating Plastic Pollution**: Plastics are non-biodegradable, meaning they do not break down naturally in the environment and can persist for hundreds of years. When plastic waste is not recycled, it often ends up in landfills, rivers, oceans, and other ecosystems, causing long-term harm to wildlife and the environment.
- **Preventing Ocean Pollution**: A significant amount of plastic waste ends up in the oceans, threatening marine life and ecosystems. Recycling helps reduce the amount of plastic that ends up in the sea, preventing marine animals from ingesting or becoming entangled in plastic debris.
- **Conserving Natural Resources**: The production of plastic requires fossil fuels, water, and other resources. Recycling plastic reduces the demand for these raw materials, preserving natural resources like petroleum, which is a non-renewable resource.

2. Reducing Carbon Footprint

- **Lowering Greenhouse Gas Emissions**: The process of recycling plastic generally uses less energy compared to producing new plastic from raw materials. As a result, recycling helps reduce greenhouse gas emissions and contributes to the fight against climate change.
- **Energy Efficiency**: The recycling process for plastics requires less energy than the extraction, transportation, and processing of virgin materials. This helps reduce the overall environmental footprint of plastic production.

3. Reducing Landfill Waste

- **Decreasing Landfill Pressure**: Landfills are increasingly overflowing with waste, including plastic. Recycling helps divert plastic waste from landfills, reducing their environmental burden and the need for new landfill space. Plastics are bulky and take up a lot of space in landfills, so recycling is a critical method of waste management.
- **Preventing Toxicity**: When plastics break down in landfills, they can release harmful chemicals into the soil and water. Recycling helps reduce this risk by preventing plastics from degrading in landfills.

4. Economic Benefits

- **Creating Jobs**: Plastic recycling creates jobs in the collection, sorting, processing, and selling of recyclable plastic. The recycling industry contributes significantly to the economy and helps create green jobs in the community.

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- **Supporting Circular Economy**: Recycling contributes to the circular economy, where materials are continuously reused, reducing the need for virgin resources and helping maintain a sustainable economy.

5. Promoting Sustainable Consumption

- **Encouraging Responsible Consumption**: Recycling can raise awareness about plastic consumption patterns and promote a more sustainable lifestyle. It encourages consumers to think more carefully about the products they purchase, the waste they generate, and their environmental impact.
- **Encouraging Eco-Friendly Product Design**: As demand for recyclable plastics increases, manufacturers are motivated to design products with recycling in mind, making it easier to recycle materials and reducing overall plastic waste.

6. Innovations in Recycling Technologies

- **Development of Advanced Recycling Techniques**: As recycling technologies advance, it's becoming easier to recycle more types of plastics that were once considered non-recyclable. New techniques, such as chemical recycling, offer potential solutions to recycling complex plastics that cannot be processed using traditional methods.
- **Creating Recycled Plastic Products**: Recycled plastic can be used to create a variety of products, from new plastic containers to construction materials, clothing, and even furniture. This creates a market for recycled materials, encouraging further recycling.

Given the pervasiveness of plastic trash, examining the recycling practices of plastic in these sustainable communities offers important insights into efficient waste management techniques as well as possible solutions for other Indian towns and housing societies.

With an emphasis on how these communities have addressed plastic waste, the strategies they have used, and the results of their efforts, this study intends to investigate the plastic recycling procedures in Mumbai's eco-housing societies.

An **eco-housing society** is a residential community designed with a focus on sustainability, environmental conservation, and resource efficiency. These societies aim to reduce the ecological footprint of their inhabitants by incorporating eco-friendly technologies and practices in the construction, operation, and daily functioning of the community. The goal of an eco-housing society is to create a living environment that is both comfortable and environmentally responsible, offering a more sustainable alternative to traditional housing developments. eco-housing societies are built with the aim of balancing modern living standards with the need to protect and preserve the environment, contributing to sustainable development goals (SDGs).

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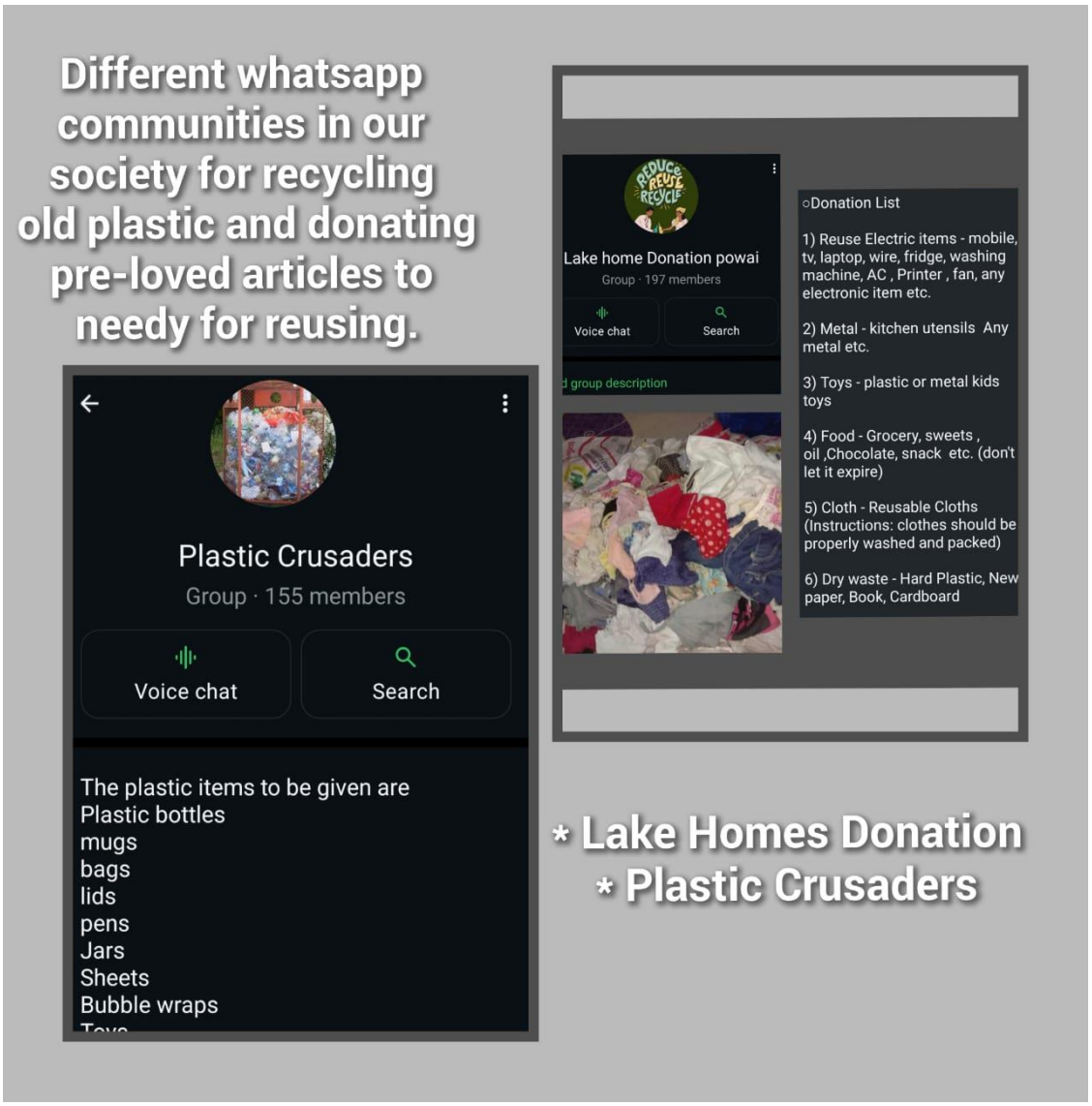

2. LITERATURE REVIEW

In recent years, the concept of eco-housing has gained popularity as a means to reduce environmental impact. Eco-housing societies are characterized by green construction methods, renewable energy use, and waste management strategies aimed at reducing the ecological footprint. According to Sharma et al. (2019), eco-housing initiatives in urban India are integral to sustainable development, particularly in cities like Mumbai, where rapid urbanization exacerbates pollution.

Plastic waste management is an issue that has garnered significant attention from both government and non-governmental organizations. Various studies (Singh, 2018; Rathi, 2020) suggest that although India has made strides in waste segregation, plastic recycling remains inefficient and underdeveloped. Eco-housing societies, however, provide a model of self-sufficiency in waste management, often implementing on-site segregation, composting, and recycling, with plastic being one of the key focus areas.

Several international case studies (e.g., in cities like Singapore and San Francisco) have shown the positive impact of community-driven recycling programs. These have served as inspiration for Mumbai's eco-housing initiatives, where communities adopt plastic recycling systems that align with their broader sustainability goals.

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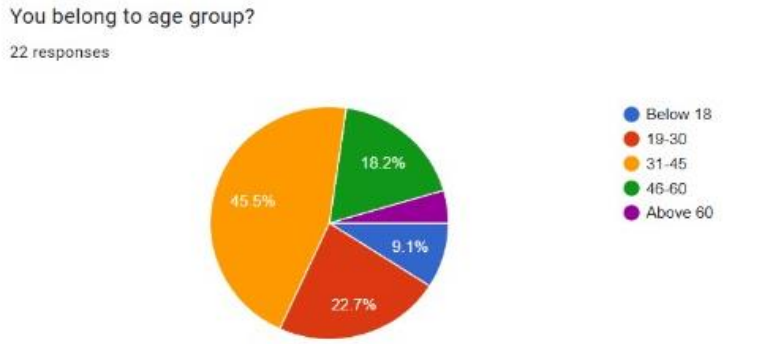
3.OBJECTIVES OF THE STUDY:

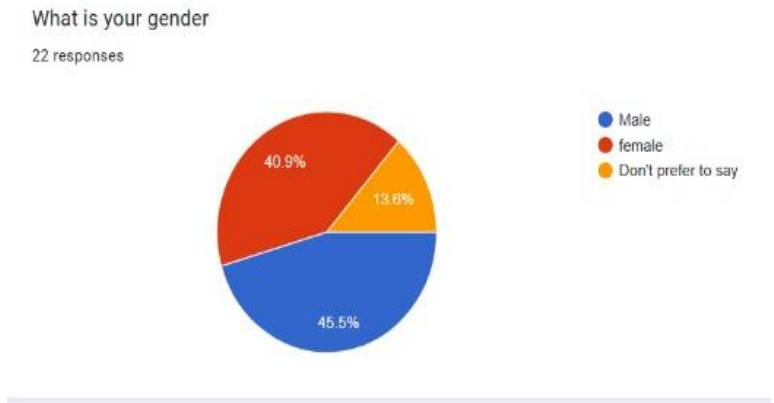
This research paper seeks to:

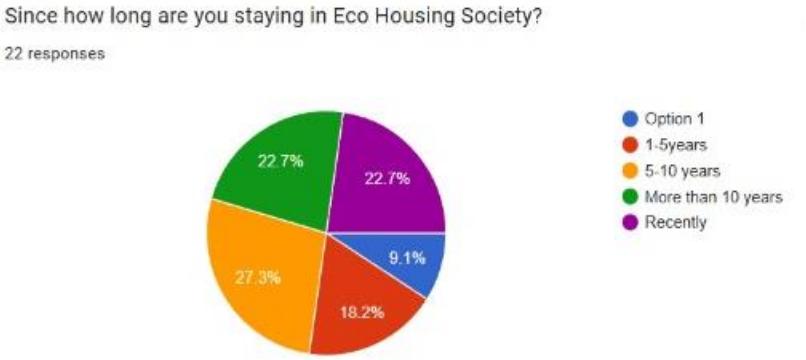
1. To study the plastic recycling practices implemented by eco-housing societies in Mumbai.
2. To understand the strategies used for collection and recycling of plastics.
3. To understand the role played by local community involved

4.RESEARCH METHODOLOGY:

It is more of descriptive research in nature and the primary data shall be collected through questionnaires while secondary data is collected from journals, magazines, newspapers, etc.







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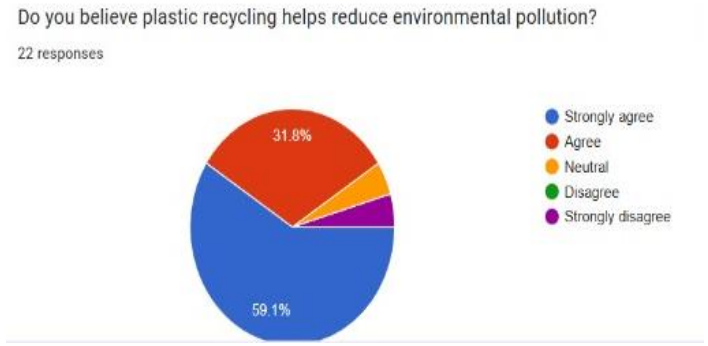

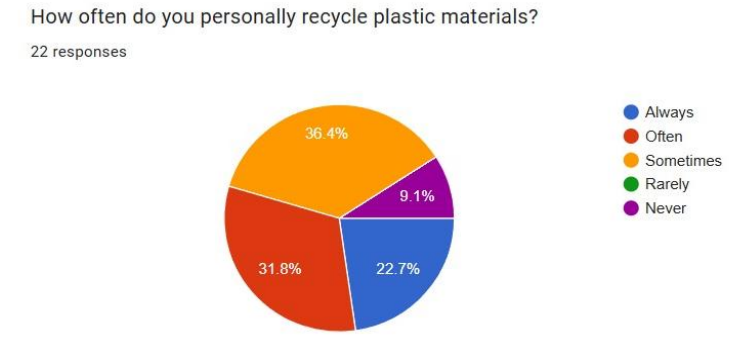

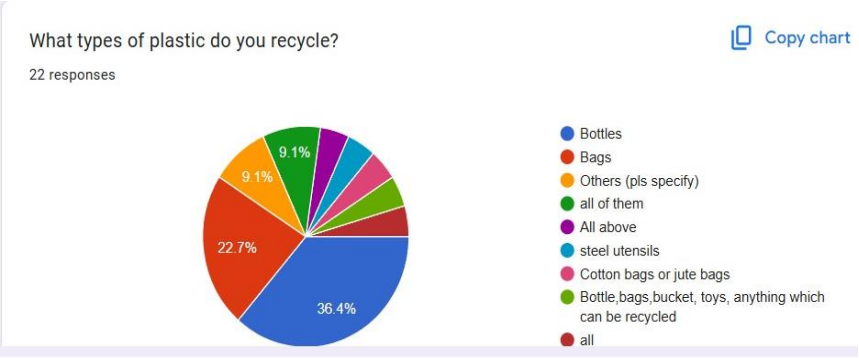

5. FINDINGS:

The residents of eco-housing societies are actively embracing sustainability by reducing plastic waste and opting for environmentally friendly alternatives like paper, cotton, and jute bags, along with reusable materials such as steel and glass bottles. Their conscious shift toward eco-friendly practices reflects a growing commitment to environmental responsibility and contributes to a larger sustainability movement.

In addition to adopting alternatives, effective plastic waste management in these societies is driven by a combination of strategies, including segregation at source, collection points, and door-to-door collection. While segregation at source improves recycling efficiency, it requires community awareness and participation. Collection points and color-coded bins provide accessible disposal options, but proper maintenance is essential. Door-to-door collection enhances convenience but demands consistent resources and coordination. The integration of these methods creates a well-rounded recycling system, fostering greater participation, efficiency, and long-term sustainability in waste management.

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6. CONCLUSION:

Residents of eco-housing societies are making significant efforts to reduce plastic waste by adopting sustainable alternatives like paper, cotton, and jute bags, along with reusable materials such as steel and glass bottles. Their commitment to eco-friendly practices aligns with a broader environmental movement, emphasizing the importance of sustainability in daily life. The role of the local community is crucial to the success of these recycling practices. Residents actively participate in recycling initiatives through educational programs, workshops, and incentive systems that encourage consistent engagement.

In addition to these choices, effective plastic waste management relies on segregation at source, collection points, and door-to-door collection. While each method has its challenges, their combined implementation enhances recycling efficiency, participation, and long-term sustainability. Despite the need for greater awareness and resource management, these efforts contribute to a cleaner environment and promote responsible waste disposal within communities

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