



# PLASTIC AND PAPER RECYCLING

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## CHAPTER-1 ABSTRACT:

Plastic recycling is the reprocessing of plastic waste into new products. When performed correctly, this can reduce dependence on landfill, conserve resources and protect the environment from plastic pollution and greenhouse gas emissions. Although recycling rates are increasing, they lag behind those of other recoverable materials, such as aluminum, glass and paper.

Plastic must be crushed or shredded into tiny flakes as a crucial step in the recycling process. The cleaned and sorted plastic is fed through shredders where it is broken up into smaller pieces. To guarantee the creation of a pure stream of material, additional sorting may be necessary.

## INTRODUCTION:

In today's world, pollution has become a highly prevalent problem. We all take note of the garbage generation and disposal processes in our cities and houses. Waste disposal has always been done carelessly, whether in towns, villages, or cities. However, because of the massive population growth, trash generation and disposal are becoming a major challenge. Waste management has emerged as a serious challenge having major implications not only for human health and social life but also for the environment. Recycling plastic is crucial since it has a terrible impact on the environment. Recycling our waste materials results in less trash being buried in landfills, which is beneficial for the environment. Fish and other aquatic creatures suffer when rivers and oceans are contaminated by plastic. Every year, a large number of animals suffer harm or are put to death because they tangle in plastic bags and wrapping or choke while attempting to consume them. Toxins build up in the bodies of fish that consume microscopic plastic particles, which are ultimately consumed by people or other animals. The more plastic that is recycled rather than sent to thrown into rivers and seas or sent to landfill, the fewer fish and other sea creatures will suffer, and the less the effects of swallowing plastics will be passed on to humans. Recycling plastic also lowers the amount of non-

renewable energy used to make new plastics because it requires substantially less energy to make new plastics from existing plastic than to make new plastics from raw materials. This reduces the strain on the power grid, meaning oil and coal is saved and carbon emissions are reduced. PET bottles, which are used to make water or carbonated beverage bottles, make up 90% of all plastic bottles. Plastic bottles may be disposed of easily. By squashing them, you may add extra space to your trash bin and ensure that they are clean and empty. Lids can be put back on the bottles, as they can be recycled too.

### How Does Plastic Recycling Work?

The first step in the processing chain is to sort out the different plastics. PET, one of the four primary forms of plastic, is typically used to create plastic bottles. Then there is HDPE, a durable plastic that can be used for pipelines or toys. PVC is utilized in packaging, building materials, medical equipment, and footwear, whereas PP is used for garden furniture, automobile bumpers, and containers. After being sorted, the plastic is next broken down into tiny pieces by being shredded or granulated. The plastic is then washed, dried and separated. The last step is to grind them into pellets, which are then given to other producers to use in the creation of new goods.

## CHAPTER-2 REVIEW OF LITERATURE PLASTIC RECYCLING

### Articles:

1. "Everything You Need to Know About Plastic Recycling" by Resource Recycling Systems.
2. "An Overview of Plastic Recycling" by Science Direct.
3. "What Types of Plastics Can Be Recycled?" by Treehugger.
4. "5 Critical Economic Benefits of Plastic Recycling to the Global Economy".
5. "The Environmental Benefits of Plastic Recycling," from The Plastics Industry Coalition.
6. "A comprehensive guide to Plastic Recycling" by Earth911.
7. "The Economic Benefits of Recycling Plastics".
8. "The Adoption of Plastic Recycling Legislation and Its Effects on the Environment: A Case Study of Germany".
9. "The Impact of Plastic Recycling Laws on the Environment: A Comparative Analysis of Europe and Asia".
10. "Analysis of Plastic Recycling Policies and Practices in Australia".

1. "Everything You Need to Know About Plastic Recycling" by Resource Recycling Systems

Plastic recycling is the process of sorting and reclaiming materials that have been collected from various sources, such as households, businesses, and industry. Plastic can be recycled in a range of different ways, including mechanical recycling, chemical recycling, pyrolysis, and gasification. Mechanical recycling is the most commonly used method because it is the simplest and most cost-effective. It involves crushing, washing, purifying, and melting down plastic before it can be further recycled.

2. "An Overview of Plastic Recycling" by Science Direct

The author has provided a thorough explanation of the different processes involved in plastic recycling. They have done a good job of explaining the various methods, such as mechanical, chemical, pyrolysis, and gasification. They have provided clear descriptions of each process and have discussed some of the benefits and drawbacks of each. The article also provides a comprehensive overview of the current state of plastic recycling and the potential for growth in the future. Overall, it is a well-written article and provides a good overview of plastic recycling.

3. "What Types of Plastics Can Be Recycled?" by Treehugger

This article discusses the challenges of plastic recycling and explains the recycling processes for various types of plastics. It identifies that most plastic waste ends up in landfills or oceans, which can cause environmental issues. Furthermore, the article looks at the implications of increasing plastic consumption, and ways to reduce and reuse plastic. It provides an overview of the existing policies and challenges of recycling plastic, and suggests possible strategic objectives and solutions. Finally, it provides recommendations for future research aimed at increasing the recycling rate, improving the existing technology, and promoting public awareness and education.

#### 4. "5 Critical Economic Benefits of Plastic Recycling to the Global Economy"

The five key economic benefits of plastic recycling to the global economy are:

1. It reduces production costs.
2. It creates jobs and generates income.
3. It reduces the need for raw materials, decreasing the use of fossil fuels.
4. It reduces the amount of solid waste in landfills and incinerators.
5. It decreases the environmental impacts of plastic production.

#### 5. "The Environmental Benefits of Plastic Recycling," from The Plastics Industry Coalition

The article, "The Environmental Benefits of Plastic Recycling," from The Plastics Industry Coalition provides a comprehensive overview of the environmental benefits of plastic recycling. It explores topics such as reducing plastic waste to landfills, saving energy and natural resources, and reducing emissions of greenhouse gases. It also discusses how recycling plastic can create jobs and create new products, as well as how businesses can benefit from plastic recycling.

#### 6. "A Comprehensive Guide to Plastic Recycling" by Earth911

The article "A Comprehensive Guide to Plastic Recycling" by Earth911 provides a comprehensive overview of plastic recycling, covering topics such as the benefits of plastic recycling, processes, and steps to recycle plastic materials. The article also highlights obstacles in the plastic recycling industry, such as confusion and access to recycling programs. The article emphasizes the importance of responsibly discarding plastic waste, underscoring the danger of unsafe disposal methods. Ultimately, the article provides useful tips and solutions to help make plastic recycling easier.

#### 7. "The Economic Benefits of Recycling Plastics"

The World Economic Forum conducted a study that found that transitioning to a "circular economy"—a system that emphasizes recycling, reuse, and responsible waste disposal—could reduce up to 90 percent of plastic waste by 2030. This would enable a dramatic decrease in ocean plastic pollution and save resources. Additionally, a 2020 study from Tappi Journal explored the factors that enable successful plastic recycling, such as the stability of the materials and the appeal of the recycled materials. The study also highlighted the challenges in plastic recycling, such as contamination and lack of adequate processing facilities.

#### 8. "The Adoption of Plastic Recycling Legislation and Its Effects on the Environment: A Case Study of Germany"

This article looks at the impacts of plastic recycling legislation in Germany, focusing on how it has impacted recycling rates, the economy, and the environment. It was found that plastic recycling laws have had a positive impact on the environment, with Germany's recycling rate going up from 44% to 74%, and plastic waste coming down significantly. Additionally, the article found that while plastic recycling laws have been beneficial in terms of the environment, they have had a somewhat negative impact on the economy, as costs have gone up to incorporate the new regulations.

## 9. "The Impact of Plastic Recycling Laws on the Environment: A Comparative Analysis of Europe and Asia"

Plastic recycling laws have had a significant positive impact on the environment in both Europe and Asia. This can be seen through the decrease in plastic waste, an increase in plastic recycling, and a reduction in emissions from the burning of plastic. In addition, the laws have had an effect on the public consciousness of plastic pollution, leading to greater awareness of the issue. Overall, this article offers a comprehensive analysis of the impact of plastic recycling laws on the environment in both Europe and Asia.

## 10. "Analysis of Plastic Recycling Policies and Practices in Australia".

This article focuses on the analysis of plastic recycling policies and practices in Australia, and the consequences of their implementation. It provides a detailed overview of the current state of plastic recycling in Australia and suggests potential ways to further increase their success. The article also examines the overall impact of plastic recycling on the environment, tackling issues such as emissions from burning and landfills, as well as the impacts on communities and local businesses. The article ultimately points out that technological advances, as well as strategic collaborations with state and local governments, are necessary for the successful reduction of plastic pollution in Australia.

## REVIEW OF LITERATURE PAPER RECYCLING

The recycling of paper is the process by which waste paper is turned into new paper products. It has a number of benefits which includes the saving of waste paper from occupying the homes and causing filth in the environment. The process of recycling of paper protects the environment and goes a long way to reduce the number of trees that are cut down in the quest of paper production.

### PAPER TO OTHER PRODUCTS (GARY M. SCOTT, 2011)

The various processes used to recycle paper into other products are in numerous ways. The processing of recovered paper into usable fiber for papermaking often results in a secondary stream which known as 'sludge'. Although the stream is considered as a waste product of the recycling process, it can be used to produce a number of different products. Paper being an organic material, has a relatively high energy value and can make an excellent fuel. Through the use of combustion technologies, paper can be converted into energy and can be turned to fertilizer through insulation. The most common form of paper recycling which is common to all households is the recycling of egg cartons or crates into construction materials and other products.

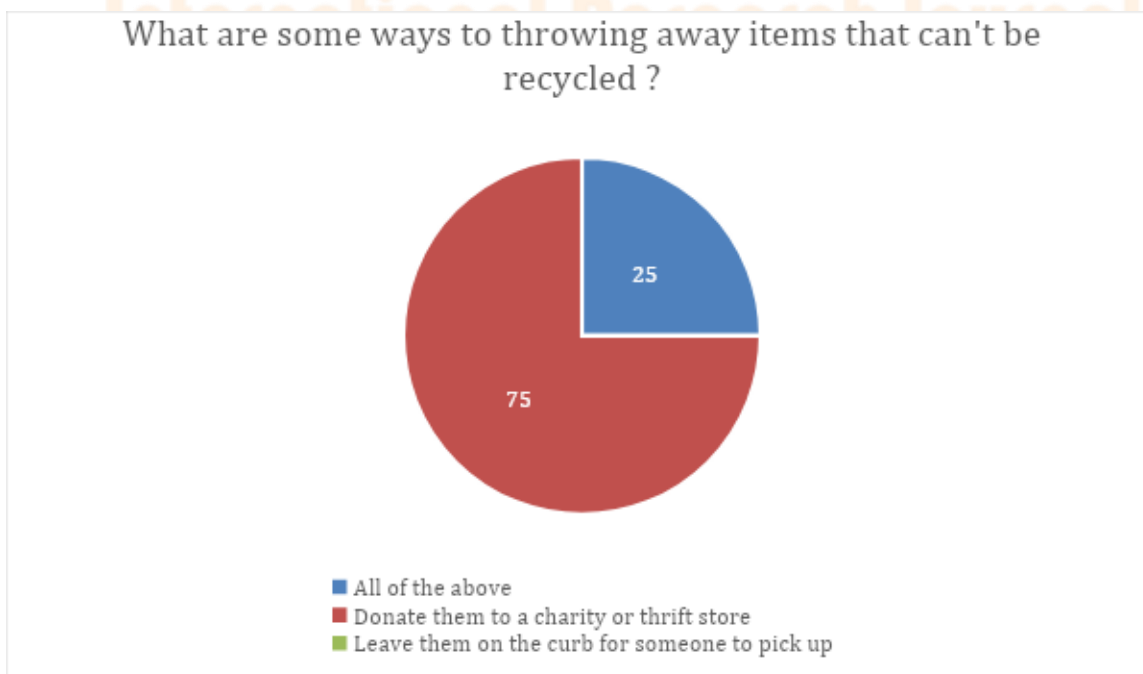
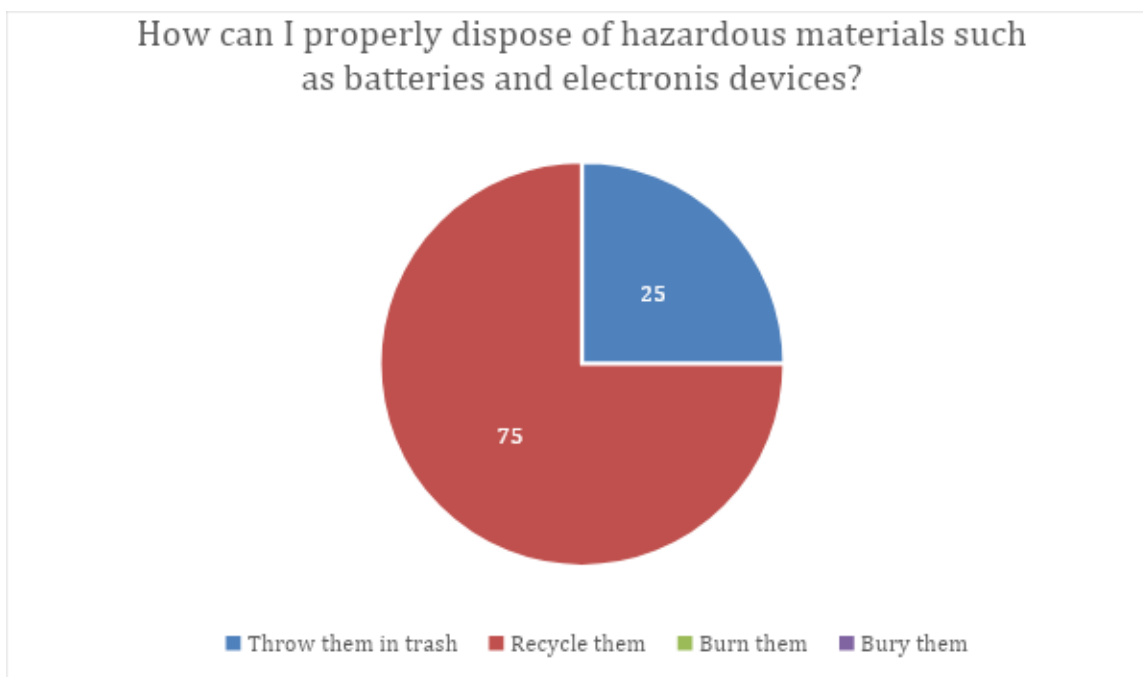
### ENVIRONMENTAL ASPECTS OF RECYCLING: HEALTH DANGERS CAUSED BY THE USE OF RECYCLED PAPER

In as much as paper recycling has numerous benefits to both man and the environment, it also has some dangers and threats it poses to the health of man as well. According to a project started by the German Federal Environmental Office in 1981, there were no visible and significant differences found between paper from its primary sources and recycled paper in its use as writing, copying or printing. Just like paper from primary sources, quality differences among recycled paper depends on the quality of waste paper, the additives used and the finishing process. Waste paper is sometimes said to contain certain pathogens that are expected to cause diseases to man when used. This means that, there is no apprehension that waste paper might be hygienically intolerable.

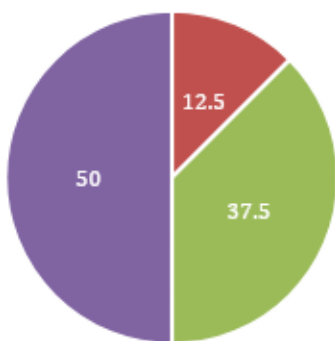
## BENEFITS OF PAPER RECYCLING

The process of paper recycling protects the environment. The usage of recycled paper to make new paper reduces the number of trees that are cut down thereby conserving natural resources. Studies in recent times show that, every ton of recycled fiber saves an average of 17 trees. Also, recycling of paper saves landfill sites disposal space and reduces the amount of pollution in the air from incineration. By using waste paper to produce new paper disposal problems are reduced. Recycling paper reduces the volume of waste while helping to boost the local economy through the collection and sorting of waste paper.

## CHAPTER-3 RESEARCH METHODOLOGY

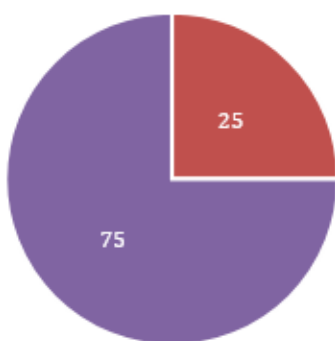


### How can I reduce the amount of food waste that goes into my garbage disposal?



- Use your garbage disposal less frequently
- Compost food waste instead
- Donate excess food to a local food bank
- All of the above

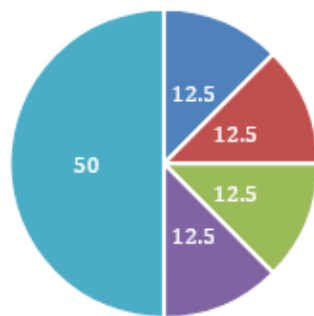
### How can I safely dispose of old medications and medical supplies?



- Flush them
- Throw them in trash
- Recycle them
- Check your local pharmacy or police station for medication disposal programs

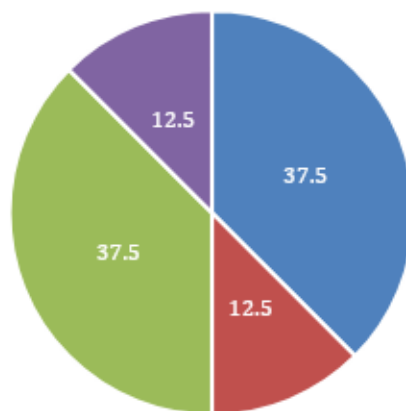
Research Through Innovation

### How can I dispose of paint and other chemicals in an environmental friendly way?



- Pour them down the drain
- Throw them in trash
- Bury them
- Keep them for future use
- Recycle them

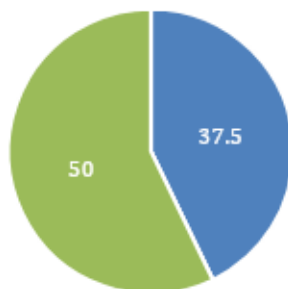
### Is it possible to recycle glass? And if so, what should I know about recycling glass?



- Yes
- No
- Glass can only be recycled if it is of a certain colour, such as green or brown
- No Idea

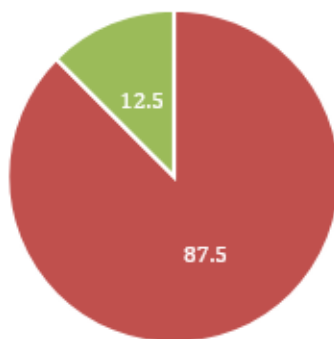


### Is it better to compost food waste or use a garbage disposal, why?



- Composting is better because it produces essential nutrients for crops to grow healthy and provide a better yield
- Using a garbage disposal is better because it saves time and effort
- Both methods are equally effective and environmental friendly
- Neither of the methods is environmental friendly
- Other

### Can I recycle old clothing and textiles? If yes, what should know about it?

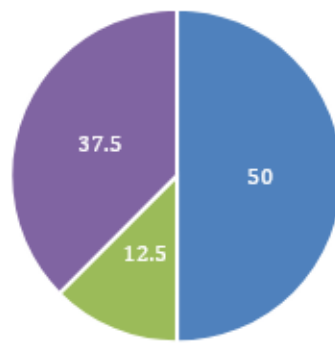


- No, clothing and textiles cannot be recycled
- Yes, they can be recycled at designated collection points
- Yes, they can be recycled in curbside programs
- No, they can be donated to a charity or thrift store





How can I determine if certain materials are recyclable in my area, and what should I do if they are not accepted?



- Check with your local waste management authority or recycling stores
- Look for recycling symbols on the instructions of packaging
- Research on the material online to know if it can be recycled
- All of the above

#### CHAPTER-4 CONCLUSION RECYCLING AWARENESS

- Plastic recycling is one of the most essential ways of preserving nature.
- Plastic should be recycled in a delicate way in order to use it properly.
- Our moto is to give back to the nature by protecting her.
- It's not possible to stop using plastic completely but the least we can do is to dispose it properly.
- The more we are lazy the more harm is caused.
- Paper recycling is also an essential element of the nature.
- It is biodegradable but it cannot be thrown carelessly.
- Proper segregation and proper disposal of paper is also necessary.
- Paper can be disposed wisely or can be recycled at home itself.
- Trash bot does the work of a human by separating and identifying the waste.
- It is a smart recycling bin that that sorts at the point of disposal.
- Use of AI in this field is necessary in order to preserve nature.
- It identifies the contaminated items and keeps them from entering the recycling bin.
- A necessary element in all the places where the disposal of trash is high.