



## Study on Quality of Recycling Paper Unit Products and Its Environmental Effects: A Pilot study

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**Abstract :** In India, polythene bags are used by the majority of the consumers. But these bags are non-biodegradable and make environmental pollution. To avoid these consequences, paper bags are the best alternate source and it is biodegradable. Hence, the present study aimed to develop the paper based products from the waste paper. In Periyar Maniammai University, the recycle paper unit plant has been established and the students' written examination papers are collected, processed and converted into various products. In conclusion, the quality of recycled paper products is comparatively good and also environmentally not polluted.

### Introduction

It is well known the paper production (likewise the other brands of industry) has enormous effects on the environment. The using and processing of raw materials has a variety of negative effects on the environment. At the other hand there are technologies which can moderate the negative impacts on the environment and they also have a positive economical effect. One of these processes is the recycling, which is not only the next use of the wastes. The main benefit of the recycling is a double decrease of the environment loading, known as an environmental impact reducing (1,2,3). From the first view point, the natural resources conserves at side of the manufacturing process inputs, from the second view point, the harmful compounds amount leaking to the environment decreases at side of the manufacturing process outputs. Recycling is not a new technology. It has become a commercial proposition since Matthias Koops established the Neckinger mill, in 1826, which produced white paper from printed waste paper. However, there were very few investigations into the effect of recycling on sheet properties until late 1960's. From then until the late 1970's, a considerable amount of work was carried out to identify the effects of recycling on pulp properties and the cause of these effects (4,5,6). In the late 1980's and early 1990's, recycling issues have emerged stronger than before due to the higher cost of landfills in developed countries and an evolution in human awareness. The findings of the early 70's on recycling effects have since been confirmed, although attempts to trace the cause of these effects are still not resolved (7).

Paper recycling plant is one in which waste paper is recycled to form a new product that is a recycled paper. Here the paper that is written or used are redeveloped to form a new Qualities of fresh paper for the use of the next generation. In India there are vast number of paper recycling units are present that recycles waste paper to a useful writing papers, craft papers, tissue papers, chart papers, and some other paper items like paper bags, files, etc. At present stage, even government of India has seriously taking steps to prevent polyethylene bags and make market to use paper bags and this action has been seriously taken out to clear environmental problem from polythene bags and make use of paper bags for better environment. And thus recycling paper unit has emerged globally for greater extent. The raw materials used for paper making are formed from wood pulp

or plant fiber, paper is chiefly used for written communication. The earliest paper was papyrus, made from reeds by the ancient Egyptians. Paper was made by the Chinese in the second century, probably by a Chinese court official named Cai Lun. His paper was made from such things as tree bark and old fish netting. To study the process techniques, industries with the production and supply in the industry and to study the environmental issue concerned with the waste water emerging out of the paper industry and to study the quality checking of product and waste water.

## **Materials and Methods**

Periyar Maniammai University a paper recycling unit is present which is called as Periyar TBI Paper Reprocessing Unit, which recycles waste paper i.e., exam written paper to recycled paper where they transform waste paper to paper bags, office files, etc.

### **Process**

As per the process in Periyar TBI Paper Reprocessing Unit There are five process here namely Hydro pulper, beating, refinery, paper making machine, finishing process.

### **Hydropulper**

Hydropulper is the pulp making machine which consist of a agitator in it. It consist of an agitator and hydropulper of capacity 50Kg. where 40Kg of paper is kept in it 10Kg of water and grinded to pulp.

### **Beating**

Here half the quantity of pulp is sent to beater where 25Kg of pulp is mixed with 400litre of water and beating process takes place. Here the pulp is nicely beaten to form as a fine quantity of pulp. For the finishing process of pulp alum is added which gives smoothness to pulp and improves the quality of paper to skinniness and is known as finishing process.

### **Refinery**

Here we use refinery as a storage tank. Were we store pulp before sending to the paper making machine.

### **Paper making machine**

Here is the paper making machine were pulp is rolled in between two rollers and made in to papers thus after made in to the paper the wet sheets are dried in the solar drier and made in to paper.

### **Finishing process**

As a process of finishing process the paper which is fully dried is sent in between two roller at high pressure so that we get well finished paper in the process as a result. Thus, the finished paper is made in to paper files, paper bags etc.

## **Results**

This study indicates that waste paper recycling play a vital role in conserving the environment. In the present study observed that environmental conservation activities by recycling the waste paper and making saleable products. The products are made in various shapes and sizes according to the intended functions. Many of the products shown in these figures (Fig.5) are sold to the locals as well as complement to the visitors of PMU. Some of these products are also sold to neighbouring institutions and commercial merchant shops.



**Fig1. Hydro pulper**



**Fig 2: Beater**



**Fig 3: paper making machine**



**Fig 4: calendaring**



**Fig5. Finished paper products**

The use of a large volume of waste papers that goes into the making of these commercially valuable goods helps in the conservation of not only the physical environment but also in poverty reduction among the members those who engaged in this process.

## Conclusion

This study indicates that Waste paper especially the examination papers in an institution is a very big problem and it also negatively impact on the environment if proper management systems are not put in place. Recycling presents an opportunity for extracting economic and environmental benefits from waste. The benefits derived from small scale waste recycling by PMU from reducing the amount of waste management, restricting environmental pollution, promoting environmental awareness and creating employment and additional income-generating activities. Periyar Maniammai University is pioneer to these kind of recycling process and very much keen in the green environment.

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