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**Optimizing Currency notes waste utilization towards environment protection and waste utilization: Potentialities and prospects**

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# Abstract

Recycling is not an obligation, but rather it is a way of living for a sustainable future. In today’s competitive world, manufacturers creates low cost products resulting less product life, thereby generating huge amount of waste, which harm’s our nature & environment. To fulfill the same ‘7R’, an effective tool for recreation & long lasting life of products is utilized**.**

With the growing demand of handmade paper both in the domestic and export markets, the Indian handmade paper industry has been confronting with the major issue of scarce availability and cost prohibitiveness of the cotton hosiery waste, the traditionally used principal raw material for making handmade paper. As a result of the exhaustive R&D work carried out at Kumarappa National Handmade Paper Institute, various ligno-cellulosic raw materials available as waste biomass in different parts of country and the recycled waste paper particularly the shredded currency waste of Reserve Bank of India has been found to be very good and cost effective raw material for making good quality handmade paper. The recently developed process of recycling the shredded currency waste through bio-enzymatic pulping produces not only a quality handmade paper but also resulted in a large saving of the precious resources like water, energy and chemicals. Physical strength properties of the handmade paper developed from shredded currency waste were found to be better than that produced from mixed office waste (MOW). Besides, shredded currency waste is available at a much cheaper rate than the waste paper. The strength of the paper produced from it could be improved further by blending it with the pulps prepared from mixed hosiery waste or other long fiber pulps. The paper thus produced can be utilized for making strong cany bags so as to substitute the polythene bags mat are going to be banned because of their recalcitrant nature. The process has been successfully up-scaled to the pilot-plant level and is also found to be economical. Thus the adoption of the shredded currency waste as a raw material and its processing through enzymatic route might help in improving the cost-competitiveness and environmental status of the Indian handmade paper industry.

**Old currency notes pulp mixed with wood pulp used as hardboards in South Africa**

Hundreds of thousands of old currency notes of Rs 500 and Rs 1000, declared invalid by the Government in the recent past, are making the rounds in far-away South Africa. The invalid notes, turned into a pulp and mixed with wood pulp, are being used as hardboards in South Africa, where general elections are scheduled in 2019. The exported hardboards are being used as placards and hoardings in the election campaign. The Logical Indiancommunity appreciates the initiative taken by WIP and the RBI where the invalid notes are being put to good use by being recycled and used for election campaigns in South Africa. Around 800 tonnes of demonetised currency was received by the company from the Reserve Bank of India’s regional office in Thiruvananthapuram. Each ton of notes is bought by WIP from the RBI for Rs 128. The entire process is undertaken at the WIP headquarters in Valapattanam in Kannur. The RBI sends the shredded notes to WIP which is then cooked at high temperature. The technique of thermo mechanical pulping is used to high-quality pulp currencies. The pulp is then put into a defibrillator (a refiner which grounds pulp material using steam). After that, it is mixed with wood pulp to make it strong enough to build into hard boards.

# Navsari Agriculture University (NAU) making long lasting currency notes

The Navsari Agriculture University (NAU) in Gujarat has standardized a process of manufacturing high value paper from Banana fiber, which it claims has the property of making currency notes lasting for about a Century. The paper has been tested in the Central Institute for Research on Cotton Technology. During the research, it was found that paper made out of this fiber has shelf life of over 100 years as it is the strongest of the long fibers ever found application of Banana fiber is viable as its availability is not a constraint. It is generated from stem of the plant which usually goes as waste and has no other application. From one hectare of Banana cultivation about 600 to 800 kilogram of fiber shall be available. The university has filed five different patents from various usage of Banana plant, which includes making of yarn for textiles, paper and candy.

# Conclusions

# The enormous increase in the quantum and diversity of waste materials generated by human activity and their potentially harmful effects on the general environment and public health, have led to an increasing awareness about an urgent need to adopt scientific methods for safe disposal of wastes. While there is an obvious need to minimize the generation of wastes and to reuse and recycle them, the technologies for recovery of energy from waste can play a vital role in mitigating the problems. Besides recovery of substantial energy, these technologies can lead to a substantial reduction in the overall waste quantities requiring final disposal, which can be better managed for safe disposal in a controlled manner while meeting the pollution control standards. While most paper used for such items as newspapers and books is primarily made of wood pulp, the currency paper made specifically for the Bureau of Engraving and Printing (BEP) is composed of 75% cotton and 25% linen – with the security thread and watermark built in. In India currency notes are made up of pulp containing cotton and balsam with special dyes to make the currency notes that should be resilient, durable, with quality to resist from wear and tear and not to be faked easily. The materials used in the making of Indian currency notes have been starch paper blended with the textile fibers. While making currencies, these papers are instilled with gelatin to give strength to the currencies. Banknotes also consist of a watermark and thread compromising of fluorescent, magnetic, metallic and micro print elements. Chinese were the first to make currency notes and in ancient times Chinese currencies were made up of paper with mulberry bark and currently Japan has been using this fiber to make Japanese Yen currencies. Sometimes the shredded currency is also recycled to make files, calendars and paper weights and ballpoint pen shells, tea coasters, cups and small trays as souvenirs for guests.

This paper explores the potential of currency waste utilization towards environmental protection in Indian economy.

# Keywords: Banknote destruction, disposal, and recycling, banana fiber, biotechnology in processing of shredded currency waste, effective tool for recreation of products.