

SUSTAINABLE DEVELOPMENT THROUGH ECO-FRIENDLY PROGRAM FOR ZERO PAPER WASTE IN INSTITUTES AND UNIVERSITIES

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ABSTRACT

Paper is the most basic necessity for life on campus for students, teachers, in school and college and any other businesses. With the increase in population; paper consumption is expected to grow-unless we take steps to reduce usage. We realize the impact upon the environment and are willing to accept a challenge to change our ways to reverse the increasing trend of paper consumption. Paper waste is increasing day by day and it has become one of the worst cause of pollution in the world. To tackle this problem; is the need of the hour. Sustaining the environment and its resources for future is a great concern. Cutting of trees for various purposes have resultant in crises called global warming. The world is in a great danger as it is losing maximum forests to cater the needs of ever progressing mankind.

Knowing the seriousness of this alarming situation, we have proposed a model for the colleges and universities that can implement eco-friendly approach to save this ever decreasing green world. Keeping the current scenario in mind about our education system and its requirement for teaching and learning process, our attempt to make this system paperless by eco-friendly model can be a beneficial factor for the ages to come. This paper presents a substantial remedy so as to recycle the large amount of paper and in turn convert and contribute it back to the institution itself and also to the society as a whole. It can act as the world's most unique, economical and eco-friendly program for sustainable development.

Key words : Waste Paper, Recycle, Eco-friendly Program, Sustainable Development

INTRODUCTION

“The greatest threat to our planet is the belief that someone else will save it”. But the fact is, we human beings ourselves have to strive ahead to preserve it. In today's electronic age, the world is starting to consider the fact of going paperless. But there is a long way to go before we lose our dependence on it. Especially, looking at its importance in the Education System of a country like India. There was a time when paper was considered to be a rare and precious commodity. But today, we are staggering a large amount of paper and thus making it look insignificant, leading to its wastage.

RATIONALE AND CONTEXT

Pulp and paper is the 3rd largest industrial polluter of air, water and soil and we all are facing its hazardous consequences. It is estimated that by 2020, paper mills will be producing 500,000,000 tons of paper and paperboard

each year. We obviously need this product and a reduction of use is not in the horizon.

As per research on web, more than 199 tons of paper has already been produced. 324 litres of water is used to make 1 kilogram of paper. To print a Sunday edition of the Times of India requires 58,000 trees. Every tree produces enough oxygen for 3 people to breathe. Paper accounts for 25% of landfill waste and 33% of municipal waste. With all the paper, we can build a 12 foot high wall of paper around the circumference of our country. Currently, we consume a large quantity of paper at our institutions and we are not as sustainable in this area as we could be. Producing baseline data and taking the steps outlined in the research; it will allow us to move in a more sustainable direction.

CRITICAL AREAS

Three critical areas that we are focussing on are as per the following:

- a) Understand the general sequence that a basic examination/general paper undergoes in a college or university.
- b) Explain regarding the current manner in which the paper is being used up in the colleges.
- c) Find substantial remedy so as to recycle this large amount of paper and in turn convert and contribute it back to the institution itself and with the outcome of this idea, contribute to the society as a whole.

OBJECTIVES

- a) To give the reader an idea regarding the necessities to create a unit sheet of paper and thus show its importance.
- b) To find various techniques and methods to convert this paper as a bulk into a substantially useful commodity.
- c) To enlighten the readers regarding the amount of paper being saved due to the process of recycling.

METHODOLOGY

- a) Collection of Used Resources such as Old Books, Administrative Papers, Old used Journals and many more through Book Collection Rallies as an Innovative Intra College Competitions so as to motivate the students to do their bit.
- b) Making a collection of all these resources, transfer it to companies which help in recycling of paper efficiently and economically.
- c) Recycled paper then can be bind together to make books, receipts, magazines or circulars or even sell it loose to the college and the students of the college itself.
- d) The amount of profit acquired from this mission can be contributed towards Tree Plantation Drives or Charities and NGOs which promote the same.

SURVEY

A student in Engineering college or any other college uses almost 20-25 pages a day and when taken into account six subjects per semester in examination at a college estimated to have approximately 2000 students. This brings to a total usage of 3 lakhs sheets of paper every day. Now, if this is the usage only with examination, then you can estimate how much amount of paper is used throughout a year in a college.

ECONOMY

The costs of using paper inefficiently in the workplace are too significant to be ignored. The expenses from supplies such as toner and paper, as well as equipment maintenance

can add up fast. Perhaps more significant than these costs is all the staff time wasted adjusting printers and copiers, filing documents, and then trying to find them again—often just to throw them away. Some findings from productivity research studies: “Inefficient use of printers, copiers, and fax machines can waste between 1 and 3 percent of company revenue annually”. For every rupee spent on copying, companies incur another 6 Rs. in handling and distribution, and half of all documents printed are thrown away within 24 hours. An average of 17% of everything printed is considered as waste.

SOCIO-CULTURAL ASPECTS

Using less paper can save your organization's money and can also help with several environmental problems. Of all the trees harvested for industrial use, 42% go for making paper. Unfortunately, the degradation of forests is the only part of the story. The pulp and paper industry is also the largest industrial user of water, the biggest water polluter, and the third largest emitter of global warming pollution in most industrialised nations. Chlorine-based bleaches are used during production which results in toxic materials being released into our water, air and soil. When paper rots, it emits methane gas which is 25 times more toxic than CO2.

Harvesting trees for paper making releases carbon (CO2). Recycled paper reduces this rate of release. When the rate of carbon absorption by the environment is more than the rate of release, it is sequestered. Carbon sequestration reduces greenhouse gases by removing some of the excess carbon dioxide from the atmosphere.

PROPOSED MODEL

We name the model called as “THE RITTLEHOUSE MISSION” to sustain the waste papers. It is named after the American Family that first contributed to the idea of Paper Recycling. It is a four step procedure to Recycle paper at our college level through techniques leading to sustainable development.



Flowchart showing Recycling of paper

Step 1: RECOVER

To recover all the paper that is used up throughout the year during exams, basic class work and the administrative work of the college through pooling resources such as Non-Biodegradable Banks, Book Collection Rally etc. and collect all the paper available to the college at one place.

Step 2: RECREATE

Using Industrial Support and Backing, recycle this huge collection of used paper back into its original form and use it as efficiently in printing various other books, college circulars and receipts or even the college magazines and newspapers. This we provide to the students at a more minimal amount as compared to products outside

Step 3 : RECTIFY

After using this paper into various kinds of spectres, we collect the amount of money that has been collected through this endeavour and eventually donate the same for a good social cause such as tree plantation drives for nature, rectifying the mistake that we did so far for the society and nature.

STEP4:REPEAT

Lessening of paper usage was predicted due to electronic revolution. But in turn it has increased the expected demand to double by 2030. By this plan, we can contribute to the college as well as the society as a whole and in turn sustain ourselves with ample amount of paper for the next coming years. This in turn will lead to avoiding major part of the 33% of municipal waste that is created due to paper.

Tangible and non tangible outputs By our model, we can contribute to the college as well as the society as a whole and in turn sustain ourselves with ample amount of paper for the next coming years.

Recycling material reduces waste. Recycling paper reduces major part of the 33% of municipal waste that is created due to paper the amount that goes to landfill. This in turn reduces the amount of waste produced by the company. Many garbage disposal companies cost their services according to weight or number of pickups per week.

Resource Plan

Current Existing Scenario	Proposed Scenario
<p>Spend 1 Kg Paper = Rs. 102/- (Reference: As per Amazon India) Cost of 1 ton of paper to the college = Rs. 1,02,648/- Paper sold in scrap in the year 2016-2017 (Returns) = Rs. 16,742/- only Total Amount Spent on Paper = Rs.85,906/-</p>	<p>Returns Cost of Recycling 1 Ton of paper = Rs. 68,000/- (Reference: Vinay Paper Mart, Recycled Paper Wholesaler, Near Indian Post Office, Bora Bazar, Fort Mumbai) Saving by college: Rs.17,906/- (Per Ton) Bonus Profit : Around 25,000/-Rs.</p>

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The College receives a major chunk of the utility in a comparative lower price and at the same time waver them off from the various kinds of inconveniences and economic inconveniences that is caused due to the Storing of the large chunk of used paper.

SUSTAINABLE PLAN

Recycling one ton of paper can save 17 trees, 7,000 gallons of water, 380 gallons of oil, 3.3 cubic yards of landfill space and 4,000 kilowatts of energy-enough to power the average home for six months- and reduce greenhouse gas emissions by one metric ton of carbon equivalent.

This represents a 64% energy savings, a 58% water savings, and 60 pounds less of air pollution. We want to contribute back to nature the chunk of it that we exploited by taking in necessary measures. From unique efforts, basic unit of Education system such as Paper can have its life and efficiency prolonged.

STAKEHOLDERS

Paperworks at Marinelines, a Mumbai based paper mill, deals in all kinds and grades of waste paper including specialty paper grades. In fact, they have developed a niche for specialty waste paper grades. Our deep study and assessment of the Indian market enables us to understand the particular requirements of the new paper.

Paperworks - represents a new beginning after the end game for paper. Specifically, the re-use and recycling of waste paper, and its systematic distribution to make it available to the appropriate users which are the paper mills who need a continuous and reliable supply of raw material.

And this is just one pebble in the sea, every year we can partner with hundreds of professionals, businesses and mills to recycle tons of paper materials.

SCALABILITY

With the university having a strength of approximately around more than 10 Million, we want to create the world's most unique, economical and eco-friendly program for sustainable Development.

CONCEPT AND INNOVATION

On a regular basis, one ton of pure paper costs a college a royalty, then the students use this as a necessity and when this scrap paper is sold it brings them in return, peanuts. And then this cycle goes on and on.

Our model of 'The Rittenhouse Mission', has a economical system that recycles the used paper to an estimated three times and in turn provide the college with cheap resource for the future, with a profit.

We recycle the paper three times to produce three grades of paper:

Grade 1 : Fresh Pure Paper for Question Papers and College Magazines

Grade 2 : Recycled 2nd level paper for College Examinations

Grade 3 : Office related Slips, Receipts and other college circulations

Now the question arises what after Grade 3, eventually the paper is wasted completely in the same way and will follow the same path. No..... This is where we bring a Simple scientific concept of Vermicompost to achieve Zero Paper Management.

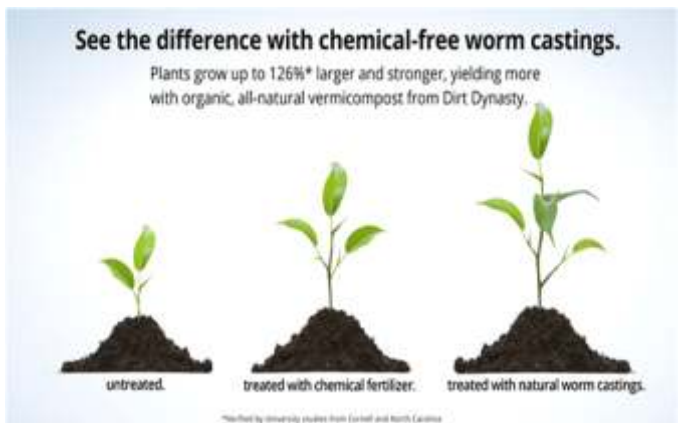
VERMICOMPOST

Referring to Muddasir Basheer and O. P. Agrawal's work on Management of paper waste by vermicomposting, we use the bonus profit of 25,000/- Rs. (Check proposed Scenerio box) to carry out Vermicomposting in our college campus. This technique is very simple and can be handled manually. Big rectangle boxes can be made on permanent basis in the garden and the gardener can handle this eco friendly technique of Vermicomposting. We shred the paper waste and add to the compositing material in the boxes. Earthworms can be purchased from vermiculture center from farms near Mumbai costing 110/- per kg. Using earthworms to convert organic wastes is an ecologically safe method that leads to an environmentally safe product. Two types of earthworms are recommended for this, they are: the Red Wiggler or manure worm (*Eisensia foetida*), and the Red Worm, another manure worm (*Lumbricus Rebellus*).



Above picture shows Rectangle Boxes prepared to make Vermicompost (Source: Internet images)

The breaking down of organic material is done by the earth worms. The end product of vermicomposting is a substance called vermicompost or "worm castings". Within a span of 2 months the process produces best quality of manure. This rich substance can be added to soil to increase its organic matter content and avail nutrients.



Above Picture shows differences in the growth of plants: Verified by University studies from Cornell and North Carolina (Source: Internet images)

Vermicompost is an eco-friendly natural fertilizer. It improves soil aeration, texture and soil tilth. It increases the water retention capacity of soil. The Vermicompost accelerates plant and promotes flowering and fruiting. It is more effective as an organic fertilizer than ordinary compost. It minimizes farm inputs and minimizes foul odour. And also, it is the best way to get rid of sensitive documents.

CONCLUSION

By introducing such a brave endeavour in our college; we aim to spread this awareness to various other colleges near and far and in turn grow and escalate this effort to national and international level. Such eco-friendly program will save paper and in turn save thousands and thousands of trees being cut and also protect our world.

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