

PAPER: Myths & Facts



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Introduction

We are living in a rapidly developing and modernized era where technology is taking charge in every walk of our life. This technology may come with many advantages and disadvantages as well. Every development is due to rapid modernization, improvement of old administration methods and the use of new technology to make things even better. However, with the growing modernization, human demand for knowledge is also increasing. Media serves an important role in keeping people informed about the events and innovations around the globe. This information may reach us traditionally in two forms, either through print media which is the oldest method, or the other one can be electronic media. In addition, in the modern era the third most emerging information channel is Digital Media via social network platforms. With the recent advancements of electronic media and daily reports on achievements, electronic media has dominated over print media during the past few years. Print media is the oldest form of Mass Media, due to rapid penetration of electronic media [1]; Print Media was taken a back seat. However, there is a growing concern about electronic media on various aspects, again the importance of Print Media and its presence may rise in the modern times. As in the case of Print Media the main consumable item is the “Paper”, it has the responsibility of sustainable production and energy conservation. The paper manufacturers are continuously adopting prudent practices to achieve sustainable goals.

Abstract: *Paper material had a rich history and heritage from ancient times to when first paper making process was early reported back in China during 2nd century BCE, to the most advanced current state of the art industrial paper production of times. The entire gamut of history, Paper has been remained as one of the sustainable and eco-friendly material despite of discovery of other versatile materials like polymers, ceramics, metals and nanomaterials. However, apart from Paper advantages, a plethora of misconceptions and critics created a few myths around the Paper material. This article highlights on most common myths and facts about Paper which is supported with basic background information. This article also looks broadly in to four aspects of myths and facts about Paper, viz. cutting trees/deforestation for paper, water consumption/effluent treatment, paper as a versatile material and environmental implications over electronic media. Paper is a versatile material with numerous uses in our daily walks of life, ranging from print industry to currency usage, decorative to packaging, and wallpaper to construction industry etc. On contrary, there are still needs of Paper which cannot be replaced by computer. We can still say that Paper will remain exists no matter digital technology grabs our society as it is used since 100 BC. Finally, this article spotlight on various myths about Paper to dispel and establishes certain facts to the understanding of the reader.*





2. Myths & Facts on Cutting Trees / Deforesting of Paper Industry

Paper Industry uses major % of non-wood fibers/ recycled fibers as raw material in the furnish conditions. In the world, no trees are 'saved' by not using paper. Our trees are grown specifically to be harvested, so that we can create valuable products from them.

Paper Industry replant harvested areas quickly. Table 1, discusses about few myths & facts about cutting of trees and deforestation for paper making process, it is clear that not only the paper industry consumes the wood but other sectors also consumes, however, only Paper Industry is harvesting back the consumed portions.

Table 1: Myths & Facts on Cutting Trees/Deforesting of Paper Industry

Paper Myth	Paper Facts
Trees are cut by only for Paper Industry.	Woods are cut for, <ul style="list-style-type: none"> • Construction and Fencing, Home Construction • Household Uses – Utensils, etc • Art Industry – Artworks, etc • Sports Equipment - Wooden Toys, etc • Commercial Uses – Furniture, etc 
Paper is made from only Forest Trees.	Sources of fiber for tree-free paper include, <ul style="list-style-type: none"> • Agricultural residues e.g. sugarcane , bagasse, husks and straw • Fiber crops and wild plants, such as bamboo, kenaf, hemp, jute, and flax • Textiles and cordage wastes • Figure 1 shows on other sources of major non-wood fibres which are widely used in the paper industry  <p style="text-align: right;"><i>Figure 1: Non-wood fibre materials</i></p>
Using less paper saves trees.	You cannot save a tree. We plant trees, which, like any other crop, are harvested when ready. You might as well say that by not drinking water you save the water. Paper Industry plant more trees than they harvest [2].
Making paper destroys forests.	Actually, the wood being used for production of paper is not being procured from forests at all. Paper Industry has joined hands with farmers to grow wood in largely degraded land unfit for any other use. Substantial amounts have been spent by the paper industry on plantation R&D, production of high-quality clonal saplings, technical extension services to improve agro/farm forestry services, hand holding of marginal farmers over a gestation period of 4-5 years [3].
Exotic plantation trees overtake the countryside.	Exotic species are not a problem if seeding into the local countryside is controlled. Exotic species found in the countryside are mostly a legacy of past practices by government, farmers and industry [3].

Paper Myth	Paper Facts
Commercial plantations compromise biodiversity.	Merely all human activity compromises biodiversity. About one third of the land we own or lease is managed to protect biodiversity. Plantations like other forms of agriculture are monocultures, but unlike most, we ensure that a variety of cultivars are grown on each plantation.
Sustainable forest management benefits people and the planet.	The Paper production process is not a threat to the ecosystem. The ground realities are very different. The industry has taken significant leaps in the last few years in technological upgradation, process-optimisation and introduction of Best Practices. The Industry has managed to bring down its energy consumption by about 20% in the last five years [2].

3. Myths & Facts on Water Consumption / Effluent of Paper Industry

Water is a precious commodity and nature's greatest gift to the living kingdom. Water consumption in agriculture is highest stands at 85%, followed by industrial section of 8% and domestic consumption of 6.6% [4]. The paper demand increases every day as a result of developed population and industrialization. Water and energy utilization and in particularly waste generation are becoming more important concern ever worldwide.

The information in Table 2 reveals that various efforts to reduce, reuse and recycle the water there by overall reduction in water footprint have been the emphasis of current paper industry. Moreover, with the advancements in water treatment technologies there is an increase in water conservation, effective effluent and process water treatment exercise, this will ensure to bring down the overall water footprint to the minimum levels.

Table 2: Myths & Facts on Water Consumption/ Effluent of Paper Industry

Paper Myth	Paper Facts
Paper industry uses More river water.	Water used for each section is reprocessed & utilised effectively. Integrated paper mills in India generate over 40% of the power they use by utilizing the biomass from the pulping process. Till a few years ago, the industry used to consume 200 cubic meters of water to produce a ton of paper. Now, the integrated mills have reduced that to less than 50 cubic meters [5].
An A4 sheet of office paper has a significant water footprint	A single sheet of our A4 office paper has a total water footprint of only 29 milliliters.
Paper Industry is Considered one of the most Polluting Industries.	Introduction of Counter Flows in washing & chlorine free bleaching stages reduced water consumption in Pulp mill. Better Technologies are used for waste water treatment such as Polyelectrolyte, Membrane & Resins. The treated water reused in production and also for crop irrigation after meeting all stringent pollution norms. Black Liquor wastes are used as fuel in Recovery Boiler. Also Green Liquor sludge's are burnt in kiln or sent for Cement Industry.

3.1 Role of Ion Exchange (I) Ltd on Water Consumption / Environmental Solutions

Ion Exchange India Ltd (IEIL) core business relates to water for five decades. The water is a precious natural resource, and essential for all human activity and for life itself. Ion Exchange India manages this increasingly scarce resource by providing total water management solutions. This is achieved by purifying water to ensure safe drinking water for homes and communities, treating water with care to meet the quality requirements for products and pollutants from wastewater, recycling and recovering water and valuable products, reuse and reducing waste and pollution. Using technology beneficially to conserve earth's most precious resource while improving quality of life and protecting the environment.

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3.2 From River to Reel

With increasing water scarcity, availability of water is a major problem for the paper & pulp industry which requires huge volumes of water for its production processes. Moreover, there are stringent environmental discharge norms that the industry has to meet. The solutions provided by IEIL to the paper industry are cost effective innovative technologies to treat water for process use as well as to reduce and recycle wastewater to achieve zero discharge.

In addition to above, IEIL have a complete range of speciality process chemicals for pulp and paper production.

Thus, with the most comprehensive range of technologies, best quality products, superior application knowledge and outstanding service support, IEIL can able to provide customised, one-stop solutions for the paper sector's varied needs. The total water management solutions offerings by IEIL are enlisted below which caters Pulp and Paper Industry to achieve environmental sustainable goals.


IEIL's Total Solutions for Water Loop Closure & Zero Discharge

- Pretreatment
- Process water treatment
- Boiler feed & cooling water treatment programmes
- Wastewater treatment and recycle to achieve zero discharge
- Comprehensive O&M of complete water systems and BOT projects
- Supply of consumables like ion exchange resins, membranes, adsorbents, water treatment chemicals, antiscalants, cleaners and effluent treatment chemicals; supply of critical spares
- Total water management consultancy - Speciality Performance and Process Chemical Programmes
- Speciality chemicals for pulping
- Wet end chemicals for paper processing
- Runnability care
- Sizing care

4. Myths & Facts on Versatility of Paper

We need to accept the invention of paper greatly helped the spread of literature and literacy. As an expression of everyday life, paper is versatile and ready to respond to changing needs. It's sustaining ages to ages and even in Digital Age. Reading holy books in paper book is more meditating than on downloaded soft copies. The human connectivity with subtler and sensitive aspects of life deep rooted with paper products, Table 3 highlights these aspects of paper.


Table 3: Myths & Facts on Versatility of Paper

Paper Myth	Paper Facts
The Paper Industry is old-fashioned.	From interactive children's books to paper batteries, anti-scan anti-copy technologies, even components of rockets and satellites, insulation paper as constantly innovating.
Paper is used for only for writing/ printing & packing	Paper has multiple application on household material & other specific Industrial uses. Cellulose is a good insulator and is also polar, having a dielectric constant significantly greater than one. Its features such as small size, high mechanical strength, and improved resistance properties, make it ideal for electrical insulation and many applications. These types of papers are primarily used in electric cables, submarine power cables, capacitors, transformer boards , etc.
Pandemic Situation only decreased Paper Industry growth.	<p>Corona Virus Survival is only three hours on paper comparatively with glass, cloth & plastic [6]. This has replaced many plastic/glass wares with paper cups/plates & tissues.</p> <p>Increase in E-commerce business has improved the Kraft Board & Tissue Industry fortune .</p> 

5. Myths & Facts on Paper Vs Electronic Media

Print versus digital is not a black-and-white issue. It's not as simple where one can say "digital communication is green" and "print communication is not." There are more gray areas involved. "Go Paperless", "Go Green", and "Save Trees" are common themes these days as many corporations and governments encourage their customers and employees to switch to electronic transactions and communications. Most consumers believe that cost savings are the driving force behind the go paperless is marketing hype. As a result, many are suspicious of marketing claims that going paperless will save trees or protect the environment. Table 4, summarizes on myths & facts about Paper vs Electronic Media, it highlights on various concerns about electronic media and how print media will emerge back as a preferred choice of communication channel.

Table 4: Myths & Facts on Paper Vs Electronic Media

Paper Myth	Paper Facts
Digital is the preferred means of communication.	Many consumers value paper-based communication. During one of the surveys, many respondents indicated that academic reading in print is more enjoyable than reading electronically [5].
Electronic communication is environmentally friendlier than print and paper.	Electronic communication is not necessarily more environmentally friendly because it also has environmental impacts. eWaste is the fastest growing waste stream. Using Google to make two internet searches, about the same amount of CO ₂ as boiling a kettle, is produced [5]. The paper, pulp and print sector are one of the lowest industrial emitters of greenhouse gasses.
eMail messages like 'think before you print' or 'save a tree', or those urging you to have your statements eMailed rather than posted to you, are based on concern for the environment	 <p>eMailing statements and invoices saves the sender money and moves the burden of printing documents to the customer. The messages should rather say: 'don't waste energy by sending unnecessary eMails and 'please recycle all printed documents' [2].</p>
Electronic communication is better for the environment than paper-based communication.	Electronic communication also has environmental impacts Additional facts: In 2016, 44.7 million tons of electronic wastes were generated, from which 435 thousand tons were mobile phones. (Source: Ellen MacArthur Foundation, 2018).

In the early years of the railway, people were seriously concerned about how the speed (18 mph or 30 kmph) would affect the human body. The Lancet published a landmark series of articles about the dangers of railway travel to public health in 1862, and at the same time 'railway spine' became a common diagnosis.

New inventions do make our lives easier in many ways, but they can also cause worries and troubles – both actual and imaginary. The trains did most certainly cause distress when they first came along and so does new technology today. These days, no one is diagnosed with 'railway spine', but we do get 'iPad neck', 'computer vision syndrome' and screen-related sleeplessness.

Computer vision syndrome, a temporary condition with symptoms like headaches, fatigue and strained and dry eyes, can be prevented by closing your eyes or looking away from the screen every now and then. Reading on

newer tablets with higher pixel densities spares the eyes, too. It can be advisable to shut off your screen a couple of hours before bedtime, even when you are 'only reading', because the blue light of the screen may suppress the body's production of melatonin, and this can disturb your sleep(7). But, Reading Moral Paragraph in paper before sleep helps sound sleep.

5.1 Various Reading habits and their effects

A study compared the reading effort on three different media: a paper page, an e-reader (e-ink) and a tablet computer. They studied eye movement, brain activity and reading speed. The participants also answered a few questions to determine reading comprehension. The interesting thing was that all participants said that they preferred reading on paper, even though the study found no support for it being more effortful to read on digital media. On the contrary, the older participants read both

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faster and with less effort on the tablet computer, due to the back lighting giving a better contrast, and because of this being better for older eyes.

But why did all the participants still prefer to read on paper? The authors suggest that it is more about people's attitude towards the digital media than the actual reading experience: 'The present findings thereby suggest that the skepticism towards digital reading media ... may reflect a general cultural attitude towards reading in this manner rather than measurable cognitive effort during reading. Figure 2 shows the survey data of Forbes 2014 on people's general reading habits.

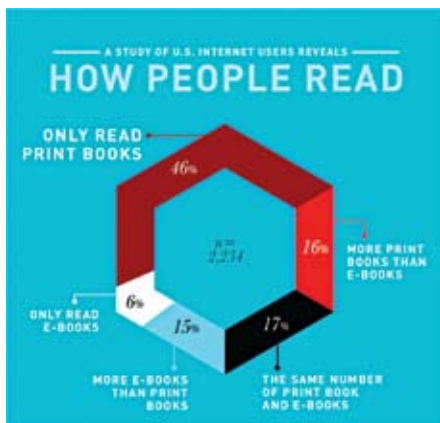


Figure 2:

Peoples general reading habits (Courtesy by Forbes 2014, Adernaline)

A study was undertaken in 2013 with tenth-graders, where the students were divided into two groups. One group read two texts (1,400–2,000 words) in print and the other group read the same texts as PDFs on a computer screen. In the reading comprehension test that was administered, the students who read on paper scored significantly better than those who read the texts digitally. It was easier for those who read on paper to remember what they had read. Mangen et al. say that this is because paper gives spatio-temporal markers while you read. Touching paper and turning pages aids the memory, making it easier to remember where you read something. Having to scroll on the computer screen makes remembering more difficult.

5.2 E-text Learning:

In a study from 2012, the authors Ackerman and Lauterman let 80 undergraduate engineering students read five texts either on paper or computer screens. After each text they completed a test, but before the test they had to make a prediction on how well they would perform in the test. They studied the texts under three different time conditions: for two texts they were allowed only seven minutes to read (pressured), for two texts they were allowed as much time as they needed (free) and for one text the participants thought they could use as much time as they wanted but were interrupted after seven minutes (interrupted).

The paper readers generally got better results, but not under the interrupted time condition, for which the results were similar for both groups, which is very interesting because if technology-related factors were what caused the inferior results for the screen-reading group, the results should have been the same under all studying conditions [7].

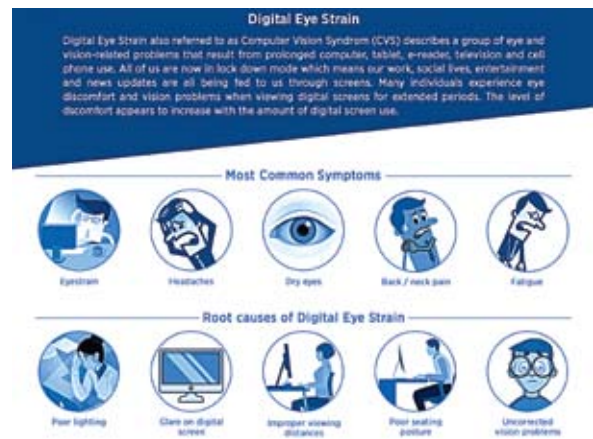


Figure 3: Causes and Symptoms of digital eye strain

Conclusion

"Having a separate place for thinking and reflection helps me get more out of my digital devices" [8]

- Loryn Cole, a researcher in Digital analytics

"Paper Print reading - is kind of like meditation — focusing our attention on something still," And it's a whole different kind of immersion than responding to digital stimuli. I think it's healthy for us as human beings to sit down with something that doesn't move, ping, or call on our attention."

-Anne Mangen, a literacy Professor

Print is visually less demanding than digital text. It provides spatial and tactile cues to help reader's process words on a page. Mindset may also be a factor. If people associate screen time with casual web-surfing they may rush through without fully absorbing the text [9].

Paper material activates the ventral striatum area of the brain more than digital media on Education & Advertisement. It's our responsibility to differentiate the myth & fact which has the real impact on our health and on environment.

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