

Sustainability Case Study: The Paper Industry

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The future of the paper industry is finite. Based on capitalistic models of business, profits must continue to grow while costs are continually pressured to remain low. Considering that the paper and wood pulp industry is heavily regulated in the United States, the extent to which the industry pollutes is contingent on the integrity of the regulations set forth. The growth of the industry since the industrial revolution has affected the legal landscape along with other large industries such as plastics, textiles, and petroleum products. Within the past two centuries, advancements in paper-making technologies, increase in global commerce, and the low cost of paper products has led to alarming increases in paper consumption which has caused significant environmental damage and untoward social implications. Present day knowledge regarding climate change and global warming indicates that interconnected, long-standing ecological systems are being broken down by current, anthropogenic activities such as the paper industry. If the paper industry is to transform its sustainability profile, a proper look at the industry statistics will provide context to further our understanding on how the three pillars of sustainability (social, environmental and economic) dictate the intricate systems involved in achieving change.

Paper surrounds us at every moment in various forms. In the United States, we use approximately 9.1 billion tons of paper annually which is an increase of over 400% in 40 years. Producing this much paper requires copious amounts of energy, chemicals, land, and water. Paper and pulp mills are the third largest industrial polluter to air, water, and land in both

Canada and the United States, and releases well over 100 million kilograms of toxic pollution each year. The industry also ranks third in terms of freshwater withdrawal and fifth among major industries in its contribution to water pollution. The energy and resource-intensive process of turning trees into paper do not go unregulated. The paper industry is one of the most heavily regulated industries in the United States (Dence and Reeve, 1996) and is greatly affected by but not limited by the provisions of The Clean Water Act, The Clean Air Act, The Endangered Species Act, and The National Environmental Policy Act. Each environmental statute regulates certain aspects of the paper manufacturing process.

Beginning with The Clean Water Act, the regulations listed therein directly affect the effluent discharge and intake of freshwater. The effluent that is discharged from paper manufacturing is governed by the National Pollutant Discharge System (NPDES) which resides under regulations set forth in the Clean Water Act. Effluent wastewater flow from paper mills, although permitted and regulated, is of great environmental concern. The Toxic Release Inventory (TRI) was established by the EPA to help categorize and monitor the use of chemicals. This has proven to be a valuable tool for improving the release of toxic substances into waterways, but more improvements are needed. (Dence and Reeve, 1996) Since the late 1970's, many mills have been required to build secondary biological waste treatment plants to adhere to the Clean Water Act provisions.

In addition to a large amount of effluent generated by the paper industry, the aggregate amount of air pollution generated is equally substantial. The biggest greenhouse gas releases in pulp and paper manufacturing come from the energy production needed to power the pulp and paper mill. The Clean Air Act heavily regulates various particulate matter, nitric oxides, sulfur

oxides and compounds, and chlorine compounds. The paper industry is the fourth largest emitter of greenhouse gasses among manufacturing industries and contributes 9 percent of total manufacturing carbon dioxide emissions. The 1990 amendments to The Clean Air Act have greatly impacted the industry, forcing updated protections which have greatly improved air quality. These amendments establish Maximum Achievable Control Technology (MACT) standards that require all applicable operations to adopt the best available pollution abatement technology. Depending on the number of firms in the industry, this means that all firms must adopt the technology of the 12 percent of firms in the industry with the most efficient technology within three years, or—if 30 or fewer establishments exist in the industry—of the five most efficient firms within three years. (McCarthy, 2005) Although the manufacturing process is a substantial part of the paper industries pollution profile, the climate change effects of paper carry all the way through to disposal. According to the EPA, the decomposition of paper is one of the most significant sources of landfill methane. Over one-third of municipal solid waste is comprised of paper, and municipal landfills account for 34% of human-related methane emissions.

Over the past 25 years, the collective environmental statutes have done much to reduce the environmental impacts of paper manufacturing but the industry. Nonetheless, the industry contributes to climate change in significant ways, many of which are global in scope. The tragedy of the commons is an economic theory of a situation within a shared resource system where individual users are acting independently according to their own self-interest behave contrary to the common good of all users by depleting that resource through their collective action. This theory captures the essence of the deeply rooted issues that must be solved prior

to substantial, lasting action taking place. No one individual can see the extent of their social or environmental impact relative to their own actions. It is the collective actions of a community, a state or a country that comprise the most visible and quantifiable effect. But the social and environmental impacts of short lifecycle goods such as paper and plastic packaging are often externalized to the environment meaning that the price paid by the consumer does not accurately reflect the social or environmental costs which the product incurs during its manufacture and disposal. So what is sustainability in the context of the paper industry and what are the best practices? And to what extent do the legal, ethical, and social factors which regulate the paper industry make an impact towards a more sustainable future within the contexts of our relationship with paper? The answers to these questions can be theorized to a degree based on our current understanding of how the industry contributes to global climate change. From this approach, the focus shifts from a business model where sustainability is profit oriented and refocuses onto a new definition of sustainability. Take into consideration the three pillars of sustainability: social, environmental, and economic. The strength of the system at the sustainability level is dependent on the individual integrity of each of the pillars.

Each of these dimensions of sustainability requires individual integrity since they are all interconnected. The environmental effects of the sourcing of trees do not just extend to deforestation and the implementation of monoculture forests. Social and economic implications also arise concerning forest locations, labor force fluctuations as well as the black markets which surface to skirt the cost of environmental regulations. The far-reaching effects of the social and economic implications are just as powerful as seeing a “green desert” where monoculture, fast-growing genetically modified tree species have diminished any chance of

biodiversity. Job markets are also fluctuated due to the impacts of regulations, as seen in the various articles related to the logging communities across the United States. These impacts, although rooted in increased environmental protection, come at the cost of lowered economic stability which enforces the sustainability model that requires balance among all pillars.

The call to action that many environmental groups have coined the “common vision” incorporates four key goals: minimize paper consumption, maximize recycled content, source wood fiber responsibly and employ cleaner production practices. (Cohen, 2014) These goals collectively exist to balance each pillar of sustainability. Reducing paper consumption can be achieved through incorporating responsible use patterns along with the elimination of excessive and wasteful consumption of paper products. This can be accomplished at the consumer as well as commercial level. In addition, maximizing recycled content can curb overall demand and affects the energy and pollution profile quite substantially. Using 100%, recycled copy paper in lieu of copy paper made from virgin tree fiber reduced net energy consumption by 31.3%, reduces net greenhouse gas emissions by 43.6%, reduces wastewater by 53.3% and solid waste is also decreased by 39.1%.

Responsible fiber sourcing can improve overall global impact in many far-reaching ways. Considering the extent to which deforestation impacts global warming and climate change, ending the use of wood fiber that threatens endangered forests and other high conservation value ecosystems considerably improves the overall sustainability of the paper industry. Many factors including the logging of endangered forests, the poor management and degradation of

forest ecosystems and the conversion of forests into tree plantations greatly affect local, regional and global sustainability.

The various environmental regulations which apply to the paper industry have surely made positive impacts on the extent to which the affected ecosystems are degraded. Through the environmental statutes that were implemented in the 1970's and the amendments thereafter, we have minimized the combined impacts of water, wood, and chemical use as well as air and water pollution. The Clean Air Act, the Clean Water Act, the Endangered Species Act, and the Cluster Rules have transformed the paper industry over the past few decades. (Ferrey, 2013) But the level of environmental regulation that affects the paper industry in the United States does not apply overseas. Third-world countries that lack environmental regulations attract profit-minded companies to source wood fiber overseas to previously unindustrialized forest landscapes. Aside from the profound implications on the local economics, these land use decisions are incredibly impactful since these areas are hotspots for carbon-rich stores which, when exploited, are released back into the atmosphere at alarming rates.

In closing, the impacts of the paper industry can be viewed from various perspectives, all which provide a clear vision of the extent of impact the industry has. The unique opportunity that this multi-perspective view provides is that the potential change is endowed in the hands of the companies. The ethical standards which have been implemented in the past decade, namely the Forest Stewardship Council (FSC), have pressured the industry to take steps towards sustainability. Although sustainability of the paper industry is hotly contested given the impending evidence of accelerated climate change, incremental change can impact local ecosystems to a great extent. Although we are not living in a completely digital, paperless

world, our society has taken steps toward sustainability and is armed with the knowledge and motivation to continue to work towards global sustainability.

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