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WASTE REDUCTION THROUGH SUSTAINABILITY: PRODUCT DESIGN

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Abstract: This research has been undertaken to investigate The concept of sustainability has constantly changed and transformed. For the idea of the environment, however, it is necessary to think not only of the world of design, but of it at large. From waste, to the products we manufacture, to energy, from our environment to cities, definitions and theories of sustainability change often. What is largely true is that everyone understands and interpretation is often different. Sustainability and what it entails, there is a strong initial thought that sustainability implies first and foremost. Sustainability means reducing your carbon footprint, But no one mentions that our imprint has been removed all together.

Index Terms – Sustainability, Product Design, Eco-friendly Design, Waste Management

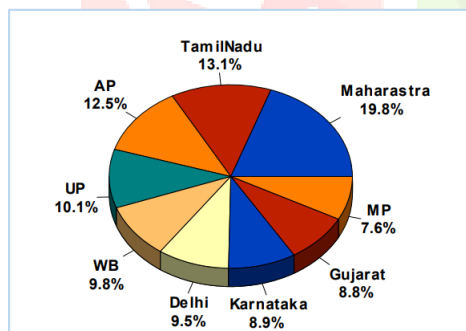
I. INTRODUCTION

Can we design products through waste? This is a question I am seeking to answer through research. Ever-increasing waste for design and systems is an ever-evolving and growing problem in our world today. Increasing urbanization, buildings and the open spaces we live in are contributing to massive destruction and growth. All these things harm the natural world. There are many "solutions" to this in the construction industry. We have no sustainability for a deeper rooted problem than the one we are living with. I am doing a research on how the waste products can last forever while managing the waste. As an interior designer and product designer, I am constantly thinking that the objects or works of art I create should be in harmony with nature. We always talk about natural disasters around us. But this can definitely bring about some change by putting our thoughts into actual action.

I believe that waste should go beyond design, eco-friendly and sustainability to address this issue. Creating "waste less" is not a solution, but a redefinition of the essence we live by. I try to solve the problem of waste through product design. I will continue to strive for this research to study systems as a tool for waste prevention and regeneration.

II. Critique

Sustainability or development has become a sustainable and major research field these days. The problem of repositioning the current path of sustainable development concerns all sectors of engineering and manufacturing society. Manufactured products affect all three aspects of people hood; Economics, environment and society throughout their life cycle; Mining, production, materials, origin use and disposal. Similarly about 80% of the results of democracy came at the production stage. The manufacturing sector appears to be a strategy for organizing, integrating products and manufacturing capabilities, and clean manufacturing objectives. Remembering the triple-bottom concept in such a situation, beliefs, democracy can be defined as the ability of a product to work continuously and ensure the lowest environmental impact and provide economic and social benefits Shareholders. In recent times, the production of e-waste has increased tremendously in the world and also in India. Managing this huge amount of waste is very difficult and due to improper waste management, many problems and health problems are created.



State wise E-waste Generation in India (Tonnes/year)

III. Concept

The concept of sustainable product design can be easily understood by considering the word "design" which is a creative activity of choosing from various possibilities. Sometimes, design is thought of as just a good idea, a sketch, or an object. However, it is a very broad concept that involves the efficient and effective creation and development of ideas through a process that leads to product development. I believe that waste should go beyond design, architecture and construction to address this issue. Creating "waste less" is not a solution, but a redefinition of the essence we live by. I try to solve the problem of waste through product design. I will continue to strive for this research to study systems as a tool for waste prevention and regeneration.

Man's increasing overuse of natural resources is working to diminish the future of planet Earth. In the face of ever-decreasing renewable and nutritious natural resources, every step humans take must be with a view to the future of the Earth. Earth asks nothing of us and we ask everything in return.

IV. Various waste management practices

In many parts of the world, the reality of "waste management" is no different and its controlled collection is not. Throw your belongings on the street outside the village, like your ancestors always did, and you don't care. When all attempts at burning fail, which is almost always the case, cover the rest of the pile with a thin layer of earth and ignore the horrible smell. This practice has been around for centuries and was very good until recently: subsistence farming organizations traditionally sourced all of their supplies from nature. Because the items were 100% biodegradable, nothing happened to them when they were thrown away – they just returned to nature. This is the tried and tested waste management system of the developing world. Problems started when 20th century inventions were injected into the system, preventing the bicycle from functioning as it had before. Plastic packaging, oil containers, tires, batteries and electronics - all interfere with nature's absorption capacity. As these products originate from a synthetic production cycle, they require synthetic treatment at the end of their life. However, as fast as these "new" products conquer new markets, there is a need to change waste management.

The demand for sustainable products has been increasing for some time now. It is a very broad field and sustainability touches everything from economic, social and environmental aspects. Many new theories and methods have emerged from this. Sustainability has evolved out of a growing interest in reaching out to society.



Modular Low-Cost Flotation Device

Saver is a modular system of interlocking tubes that help you build flotation devices. The tubes themselves do not float, rather, they allow you to attach several plastic bottles around the rim to keep the entire product floating. You can either assemble the savior to form a U-shaped training device, or add several pieces to close the U, turning it into an O-shaped device that kids can use as a tube. Savior is low-cost, and its individual modules can easily be 3D-printed on demand. Moreover, it uses plastic bottles, helping to recycle waste. If a plastic bottle gets damaged, it can easily be replaced with another bottle, allowing you to quickly upgrade/repair your training gear.



Rashmi Bidasaria

Rashmi Bidasaria developed Dross in collaboration with Hubli, India recycling steel scrap foundry Southern Ferro Limited, which focuses on utilizing waste byproducts from the molten iron processing industry, such as steel slag, ramming mass and residual heat. Bidasaria designed new objects using industrial techniques and scrap found in foundry waste piles: "The artworks created through this process are intended to develop a more responsible sense by giving space to think about the use of materials and production processes."



V. RESEARCH METHODOLOGY

There's no denying that plastic is an amazing material. Their adaptability and durability make their production and use faster than most man-made materials other than steel, cement and brick. Since mass production began in the 1950s, polymers are now all around us—incorporated into everything from food packaging and clothing to aircraft parts and flame retardants. But the amazing properties of plastic are now creating a growing problem. None of the commonly used plastics are biodegradable. The only way to permanently dispose of their waste is to heat it destructively – through a decomposition process known as pyrolysis or simple incineration; Although the latter is further complicated by health and emissions concerns.

Follow the 3 R's

An easy way to contribute to the Swachh Bharat Mission and make a small difference in waste disposal is by adopting the 3 R's - Reduce, Reuse and Recycle. Landfills across India are overloaded and it is estimated that waste generation is likely to increase from 62 million tonnes to 165 million tonnes by 2030 if waste generation is not reduced. Reusing your household waste is a great way to reduce waste. For example, instead of throwing away plastic bottles, use them to decorate your home and make other DIY plastic showpieces. Switch to refillable items like printer cartridges or glue, reuse plastic folders. Use old wood and pallets to make



compost bins. Reuse shampoo bottles as cell charging stations, old toothbrushes as cleaning tools.

A sustainable product design solution effectively deals with the functional properties of the product and properly balances the three dimensions of sustainability. All three aspects of sustainability must be considered as an essential part of sustainable design. However, initially, the environment was the only concern for product design. So, developing environmentally friendly or ecological (eco-design) was practiced during the first wave of sustainability. Since then, several tools called eco-design or Design for Environment (DfE) tools have been developed to support the product design phase.

VI. Structure

Plastics production has been outpacing global GDP growth for 70 years because there are so many utilities attached to it, said Martin Stuchte, co-founder and managing partner of SYSTEMIQ, a firm specializing in investments and investments in innovative systems. The design of plastics has been optimized over the past 20 years to use the least amount of resources and save carbon—but without regard to their final disposal, said Marco ten Bruggenkett, business vice president for Europe, the Middle East and specialty plastic packaging, Africa at Dow Europe. But if products are designed with end-of-life in mind, almost all of the benefits of plastics can be achieved without the negative consequences, said Richard Thompson, director of the Marine Institute at the University of Plymouth. For example, adding red dye to PET (polyethylene terephthalate)—an easily recyclable plastic used in beverage bottles—makes it more difficult to process, he explained. Companies should produce products with less plastic, using alternative materials with a lower carbon footprint and easier to process. Products for which plastic is the best material should be designed for recycling or use polymers that are easy to recycle.

Recycling

Lack of recycling infrastructure is a key barrier to creating a circular plastics economy. Plastic recyclers told the summit audience that a major issue is cost. They find it difficult to compete with producers of virgin plastic: challenges include material supply and quality and the cost of collecting and processing waste plastic. One solution is to create a market for recycled plastics through regulations on minimum recycled plastic content in products, as the EU has done. Another is to use recycled plastics to produce high-specification industrial materials, said Kian Seah, chief executive of Heng Hip Industries in Malaysia. Advances in recycling technology are opening up new options. Mechanical recycling is more mature; Emerging chemical recycling technologies are developing but require more investment and innovation. The latter will enable companies to process a wide variety of materials and produce virgin-plastic-like resins suitable for the production of items such as food packaging, where high-quality materials are required. Increases in plastic pollution entering the oceans are predicted to result from wealth and population growth in countries with poor waste management systems. To help shed light on the issue, The Economist Group and The Nippon Foundation, as part of Back to Blue — a multi-year initiative on pollution and ocean health launched at the summit — plans to release an index measuring countries' ability to manage plastic.

VII. Collaboration

Change can and must happen only when all players—governments, plastic manufacturers, recyclers, and consumers—collaborate. Even big brands must work with competitors, as no single company can operate alone, brand representatives said. In the U.S., for example, PepsiCo and Coca-Cola are working together to recycle plastic beverage bottles as part of the American Beverage Association's Every Bottle Back initiative, said Burgess Davis, vice president of global sustainable plastics at PepsiCo. Major brands in the consumer-goods industry are also collaborating on consumer-goods forums and other forums to address this issue. Ann Tracy, Colgate-Palmolive's chief sustainability officer, said consumers can be a barrier to change. Although consumers are aware of plastic-waste issues, more research is needed to examine how willing they are to accept changes in products and how much they are willing to pay for different packaging, Ms Tracey said. Her company is in the process of moving into fully reusable toothpaste tubes. During the Covid-19 pandemic, consumer demand for plastic packaging has increased, for example, consumers prefer packaging over loose food. Still, plastic pollution remains a major concern for consumers, according to a survey conducted as part of the Back to Blue program. Businesses, the public sector and consumers identify plastic and chemical pollution in the oceans as the two top ocean sustainability issues, followed by climate change.

VIII. Conclusion

Now is the time to adopt sustainable production methods. From waste to sustainable things can prevent disasters. Sustainability affects the entire value chain, providing tremendous economic value and competitive advantage. Adding value and improving profitability is possible, planet by planet, from the people affected by your operations and products. But it is a serious undertaking that requires strategic planning, significant process changes and organizational change efforts to change the "DNA" of your extended enterprise. There is a lot of work to be done, but the contribution of many organizations, companies, associations and every citizen can keep us connected to sustainable values.

IX. REFERENCES

[1] Johannes Zachrisson and Casper March 30, 2012 (Retrieved from; Books Exploring behavioural psychology to support design for sustainable behaviour research.)

https://www.researchgate.net/publication/264814315_Exploring_behavioural_psychology_to_support_design_for_sustainable_behaviour_research

[2] Journal of Cleaner Production, Volume 79, 2014 (Retrieved from; Adapting the Robust Design Methodology to support sustainable product development)

<https://www.sciencedirect.com/science/article/abs/pii/S0959652614004788>

[3] 3.JalilaEssaïdiFrom Wikipedia, the free encyclopedia (Retrieved From https://en.wikipedia.org/wiki/Jalila_Essa%C3%AFdi)

[4] F. Wiengarten *et al.*

[5] Reduce Reuse Recycle Posters and Drawing Ideas

November 21, 2022(Retrieved from <https://www.earthreminder.com/reduce-reuse-recycle-posters-and-drawing-ideas/>)

[6] Learn the meaning and actions of reduce, reuse and recycle. (Retrieved from

https://cuyahogarecycles.org/learn_reduce_reuse_recycle/)

[7] S.A. Waage (2007)

(Retrieved from [Re-considering product design: a practical “road-map” for integration of sustainability issues](#)

J. Clean. Prod.)

[8] Integrating Ethics into Design for Sustainable Behaviour

September 2013 [J of Design Research](#) 11(3):278-299 (2007)

(Retrieved from

https://www.researchgate.net/publication/257332498_Integrating_Ethics_into_Design_for_Sustainable_Behaviour)

[9] THE TOP 10 SUSTAINABLE PRODUCT DESIGNS THAT HELP YOU MAINTAIN AN ECO-FRIENDLY AND GREEN LIFESTYLE!

BY [SRISHTI MITRA](#) 02/28/2021 (Retrieved from <https://www.yankodesign.com/2021/02/28/the-top-10-sustainable-product-designs-that-help-you-maintain-an-eco-friendly-and-green-lifestyle/>)

[10] Guide to Sustainable Product Design: A Sustainability Roadmap for Manufacturers

Written By: [Preeya Dave](#) 11/30/2022 (Retrieved from <https://www.ptc.com/en/blogs/plm/guide-to-sustainable-product-design>)

[11] What are some elements of sustainable product design?

[Dave Turbide](#) 10 Nov 2017 (Retrieved from <https://www.techtarget.com/searcherp/answer/What-are-some-elements-of-sustainable-product-design>)

[12] [By Jonathan Amos](#)

Earth is becoming 'Planet Plastic' Published ;19 July 2017 (Retrieved from <https://www.bbc.com/news/science-environment-40654915>)

[13] Why measuring plastic waste is the first step toward managing it

[Science](#) Jan 21, 2020 (Retrieved from <https://www.pbs.org/newshour/science/why-measuring-plastic-waste-is-the-first-step-toward-managing-it>)

<https://www.iconeye.com/design/30-designers-waste-products-wasted-katie-treggiden>

<https://www.frameweb.com/article/11-design-products-and-collections-made-using-waste-and-recycled-materials>

<https://sdcuk.in/epr-is-the-only-weapon-to-tackle-plastic-pollution/>

<https://swachhindia.ndtv.com/album-detail/waste-management-5-simple-ways-to-reduce-waste-at-home-24337/>

<https://www.yankodesign.com/2021/08/12/recycled-product-designs-that-leave-zero-footprint-on-the-environment-help-you-master-that-green-lifestyle/>