Tuijin Jishu/Journal of Propulsion Technology
ISSN: 1001-4055
Vol. 45 No. 2 (2024)

E-Waste Management and Sustainability Development

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Ph. D (chemistry): Inorganic chemistry (Extraction of Metal from Waste sludges & E-Waste Management – (pursuing)

Abstract

Due to technological applicability, garbage isn't being rid of and thrown away as quickly as it used to be, even if the electronic and electrical industry is expanding quickly globally. Electronics practices are growing as a result of work being more digitally transformed, particularly in the IT, healthcare, and automotive sectors. In industrialized nations, the number of gadgets per person is increasing, which leads to a rise in the output of e-waste per capita. From the age of 3 years old to 70 years old (taking into account average age), every individual carries at least 3–4 devices in their hands. The rise of electronics and electricity is astounding. In addition, it is contributing to both global population growth and technological improvement.. E-waste is a major risk to the environment and human beings as it may contain hazardous & toxic substances like metals which are harmful to biological variability and the environment.

Because e-waste may contain toxic and dangerous materials like metals that are bad for the environment and biological organisms, it poses a serious concern to both humans and the environment.

As demonstrated in many developing nations, including China, India, Nigeria, Pakistan, and many Asian countries, the life cycle and types of electronic waste have been shown to have detrimental effects on the environment, ecological system, and human health. Additionally, the ridiculous disposal practices of these waste materials have contributed to even greater levels of threat.

The improper disposal of electronic waste, including harmful chemicals and heavy metals, can have negative impacts on the environment, ecological systems, and human health. This problem is particularly prevalent in developing countries like China, India, Nigeria, and Pakistan.

To address this issue, various approaches have been suggested, including recycling, recovery of precious metals, the implementation of circular economy concepts, developing relevant policies, and the use of advanced computational techniques. These methods can help to manage e-waste more effectively and may also provide secondary resources for critical materials that are at significant supply risk.

Introduction

In 2022, around 60 million tons of electronic waste (e-waste) were produced worldwide. The presence of heavy metals in e-waste makes it potentially hazardous. However, e-waste also contains precious metals like gold, silver, and copper that can be extracted. The use of advanced tools such as artificial intelligence and machine learning can aid in efficient e-waste management.

Brief literature review

Sustainability in marketing is studied from various perspectives, particularly environmental, social, and economic. Previous studies have evaluated and analyzed green or environmental marketing strategies, as well as marketing strategies from the social aspect. However, there is a need to design a marketing strategy that can effectively address problems related to achieving environmental, social, and economic goals and objectives in an integrated manner. Nonetheless, designing an effective marketing strategy can be complex, as each business objective requires a different marketing strategy that comprises a unique set of decisions. Therefore, analyzing and evaluating marketing strategy in terms of sustainability is also a unique objective that requires special attention. This paper will focus on the concept of marketing strategy, the evolution of sustainability in marketing, as well as the concepts of sustainability marketing and sustainability marketing strategy. Lastly, it will discuss the issues and changes related to sustainability marketing strategy.

Sustainable development refers to how to sustain development for current and future generations, rather than how to create resilient infrastructure. It strives to meet the needs of developing countries seeking to achieve a more sustainable world. Sustainable development addresses the present moment's needs without compromising current and future generations to meet their sustainable lifestyles. E-waste management is related to sustainability development as it aims to reduce the negative impact of electronic waste on the environment and human health, contributing to achieving a sustainable world.

Sustainability Practices For Management Of E-Waste

To manage electronic waste sustainably, a country needs to establish a system that is flexible and adaptable to handle varying amounts and qualities of e-waste. Best practices from different countries can be adopted to ensure effective management of this waste. One such practice is the "Close the loop" method, which involves analyzing both the forward and reverse supply chains. Manufacturers must be held accountable for managing e-waste and handling it appropriately. Public-private collaborations can also be beneficial in managing e-waste. India has already implemented several initiatives to recycle and reprocess e-waste in an environmentally friendly manner. The laws must ensure that electronic waste is recycled and repurposed.

To prevent future financial crises, the financial system needs to shift its focus to support long-term funding for sustainable development investments. Various factors, such as changing economic and social dynamics, demographics, technological advancements, and environmental degradation, have contributed to global issues faced by sustainable development. Therefore, it is crucial to understand the links between these developments and the resulting changes in social, cultural, and environmental contexts.

During the United Nations Conference on Sustainable Development held in Rio de Janeiro, Brazil, from June 20 to 22, 2012, several interconnected issues that require urgent attention were highlighted. These issues include food security, energy, decent jobs, and sustainable cities.

Weaknesses of sustainable development:

Causes of Electronic Pollution:

1. The rapid technology innovation is one of the main causes of e-waste pollution. With the increase in technological and industrial demand, new electronic devices have been developed resulting in unwanted and unused devices. These unused devices are not properly disposed of, leading to e-waste pollution.

2. The rising demand for electronic products is another factor contributing to e-waste pollution. In today's digital world, every work is carried out digitally, and every digital user needs an electronic device, leading to an increase in the production of electronic devices.

3. The lack of reparability of electronic devices is another cause of e-waste pollution. Many electronic devices become useless if not repaired or replaced, leading to their disposal and contributing to e-waste pollution.

4. Illegal e-waste trade is also increasing e-waste pollution. Many business companies and traders export and import e-waste from and to countries and the same e-waste is being reused and recycled using unsafe and illegal processes.

5. Furthermore, the lack of awareness among citizens regarding the harmful impacts of e-waste is another factor contributing to e-waste pollution. Many electronic users are still not aware of the proper disposal methods, leading to environmental and health-related problems environmental and health-related problems.

Being costly is one of the main drawbacks of sustainable development. It can cost a lot of money to adopt sustainable practices like renewable energy and green infrastructure. This may discourage some companies and people from implementing sustainable practices.

In summary, weak sustainability views ecology and economy as mutually exclusive, which has the unintended consequence of making the economy into an "end in itself." Conversely, strong sustainability asserts unequivocally that there would be no people without nature, and there would be no economy without people.

The following are the three benefits of sustainable development:

It encourages water conservation, energy efficiency, durability, better indoor air quality, enhanced health, higher productivity, cost savings, and increased property value.

One of the major drawbacks of sustainable development is its costliness. Adopting sustainable practices such as renewable energy and green infrastructure can be quite expensive, which may discourage some individuals and companies from implementing these practices.

Here are ten benefits of sustainable development in point form:

- Encourages water conservation.

- Promotes energy efficiency.

- Enhances durability.

- Improves indoor air quality.

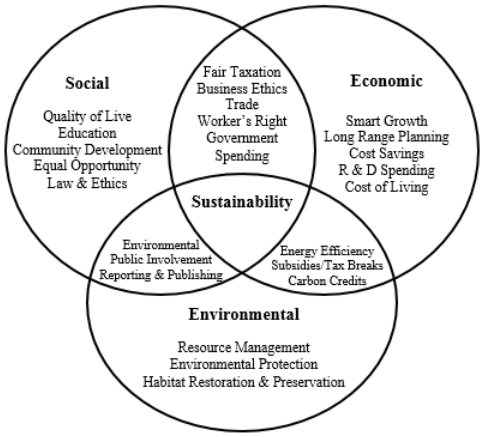
- Enhances health.

- Increases productivity.

- Leads to cost savings.

- Boosts property value.

The three problems in sustainable development:



In the last step, we introduced the 17 Sustainable Development Goals. However, as you will see in this course, there are many challenges to achieving these aims. We can break these challenges down into three main categories: inconsistency, execution, and governance.

The approaches to sustainable development

Scholars typically identify three pillars of sustainability: the material, social, and economic. These aspects can be described using various terms, such as components, determinants, or aims.

Weak sustainability suggests that natural capital can be fully substituted, while strong sustainability argues that this substitutability can be severely restricted due to the presence of essential elements that natural capital provides for human life and health.

The three fundamental pillars of sustainable development are social, economic, and environmental. The Brundtland report, which popularized the concept of sustainable development, emphasized the development of human resources, extreme poverty reduction, global gender equity, and wealth redistribution.

Culture is often considered a fourth pillar of sustainable development. It encompasses all three of the fundamental aspects of sustainable development and includes differences in sustainable lifestyles and carbon emissions in different regions.

Implementing these four pillars of sustainable development in your company can benefit the smooth running of your business and promote a responsible management policy (CSR).

The social pillar focuses on ensuring the well-being of all people. A company with a strong ethical operation model will set a good example of good practices for a more virtuous association.

The economic pillar aims to optimize your budget by adopting a more accountable approach to production, reusing, limiting waste, and utilizing inexhaustible natural resources. Better resource administration and waste management are good practices for optimizing budget and natural resources.

The environmental pillar aims to upgrade CSR game plans by integrating incidental targets into the management of your guest. It helps to diminish climate change and establishes a sustainable experience for future generations.

Culture is a crucial component of sustainable development as it helps to build honest public ties, which can lead to more active exchanges, better teamwork, and an increase in employee productivity.

Promoting data plan integrating the Sustainable Development Goals (SDGs) into your CSR game plan, and offering preparation and approach to employment are all great steps to attainable happening.

Reviewing your energy use as part of your CSR game plan can help determine your company's exact energy consumption. It is a productive habit to target the region's energy efficiency needs. Renovating and protecting your buildings also plays a vital role in sustainable development.

To promote environmental friendliness, we can implement an eco-friendlier travel plan. This can involve running a company shuttle, which can discourage your employees from using their vehicles, thereby reducing carbon emissions.

Organizing dark events is an excellent way to strengthen friendly bonds within your team. You can also issue vouchers for cultural exercises to promote cultural events, which are always popular among employees.

Founding a company sports team is a popular trend in France. It not only makes for a fun co-active project, but it also promotes teamwork and healthy competition among colleagues group spirit, and solidarity.

Sustainable development involves understanding the connection between human needs and the environment to improve the quality of life of society while preserving resources for future generations. Sustainable management tools such as Sustainable Materials Management Prioritization help identify opportunities for environmental improvement in the production and consumption of goods and services. These tools allow businesses and organizations to evaluate their social, economic, and environmental impact, which is crucial for fair distribution of resources and opportunities.

Sustainable development is a wide-ranging concept that covers social, economic, environmental, and institutional aspects. The social dimension aims to build a strong, healthy, and fair society, focusing on issues such as zero hunger, quality education, good health and well-being, gender equality, and population control. In the economic dimension, the focus is on promoting the economic well-being of the masses, with emphasis on sustainable economy, poverty alleviation, employment opportunities (especially for women), decent work and economic growth, natural resource management, and responsible consumption and production.

The environmental dimension involves promoting the use of eco-friendly and biodegradable products, clean water and sanitation, affordable and clean energy, reducing emissions from industry, transport, and energy, encouraging the use of renewable sources, climate action, and preservation of natural resources while respecting and protecting natural habitats of life forms. The institutional dimension of sustainable development includes industry, innovation and infrastructure, sound financial resources, peace, justice and strong institutions, sustainable cities and communities, partnerships for the Sustainable Development Goals (SDGs), and international cooperation.

The ultimate goal of sustainable development is to meet the needs of today without compromising the needs of tomorrow. This means that we must operate within the right economic, social, and environmental boundaries to create a truly sustainable health system that is fit for the future. Sustainable development involves understanding the connection between human needs and the environment to improve the quality of life of society while preserving resources for future generations. Sustainable management tools such as Sustainable Materials Management Prioritization Tools help identify opportunities for environmental improvement in the production and consumption of goods and services. These tools allow businesses and organizations to evaluate their social, economic, and environmental impact, which is crucial for the fair distribution of resources and opportunities. The scope of sustainable development is vast, encompassing social, economic, environmental, and institutional dimensions. The social dimension aims to create a strong, healthy, and just society, with a focus on issues such as zero hunger, good health and well-being, quality education, population control, and gender equality. In the economic dimension, the focus is on the economic well-being of the masses, with an emphasis on alleviating poverty, sustainable economy, employment opportunities (especially for women), decent work and economic growth, managing natural resources, and responsible consumption and production.

The environmental dimension involves promoting the use of eco-friendly and biodegradable products, clean water and sanitation, affordable and clean energy, reducing emissions from industry, transport, and energy, encouraging the use of renewable sources, climate action, and preservation of natural resources while respecting and protecting natural habitats of life forms. The institutional dimension of sustainable development includes industry, innovation and infrastructure, sound financial resources, peace, justice and strong institutions, sustainable cities and communities, partnerships for the Sustainable Development Goals (SDGs), and international cooperation. The ultimate goal of sustainable development is to meet the needs of today without

compromising the needs of tomorrow. This means that we must operate within the right economic, social, and environmental boundaries to create a truly sustainable health system that is fit for the future.

The United Nations established a set of 17 interconnected goals between 2015 and 2030, known as the SDGs or global goals. These goals aim to eradicate poverty, protect the planet, and ensure peace and prosperity for all. Each goal has a set of targets, totaling 188 across all 17 goals, with subsets of 230 indicators.

All UN Member States adopted these goals in 2015, calling for universal action to achieve them by 2030. The 17 SDGs include: No poverty, Zero Hunger, Good Health and Wellbeing, Quality Education, Gender Equality, Clean Water and Sanitation, Affordable and Clean Energy, Decent Work and Economic Growth, Industry, Innovation, and Infrastructure, Reducing Inequality, Sustainable Cities and Communities, Responsible Consumption and Production, Climate Action, Life Below Water, Life on Land, Peace, Justice and Strong Institutions, and Partnerships for the Goals.

- On July 6, 2017, the United Nations General Assembly adopted a resolution that identified specific targets and indicators for each of the Sustainable Development Goals (SDGs) to measure progress. Achieving these goals requires a collaborative effort from governments, private sectors, civil society, and citizens to ensure a better planet for future generations.

- The SDGs address several cross-cutting issues, such as gender equality, education, and culture, which are crucial across all the SDGs. Sustainable development requires the convergence of multiple sectors, including the economic, social, political, and environmental sectors, with interdependent development decisions. Progress will need multidisciplinary and transdisciplinary research across all these sectors, which can be challenging when governments fail to support it.
- The UN aims to reach out to the community as widely as possible while also adjusting data or information for vulnerable groups such as children, the elderly, persons with disabilities, indigenous people, migrants, and internally displaced persons. The COVID-19 pandemic had severe implications for all 17 SDGs in 2020. The concept of sustainability refers to four distinct areas: human, social, economic, and environmental, which are commonly known as the four pillars of sustainability.
- Human sustainability aims to maintain and improve the human capital in society. Social sustainability is about improving the well-being of individuals and communities, whereas economic sustainability aims to ensure that resources are used efficiently and effectively to support economic growth.
- Environmental sustainability is about preserving natural resources and minimizing negative impacts on the environment. There are different analytical techniques known as sustainability assessment tools that attempt to understand a system and present the information in a way that can assist the decision-making process.
- Quality and sustainability are closely related concepts. While quality refers to the level of excellence or standard achieved in a product or service, sustainability relates to the ability to maintain or improve that quality over time while minimizing negative impacts on the environment, society, and the economy.
- Sustainable quality of life means ensuring that the quality of life for individuals and communities can be maintained or improved while also preserving the environment for future generations. Companies with a sustainable approach meet their needs without compromising the needs of their customers, stakeholders, or the planet.

Sustainability is the ability to maintain a good quality of life in a community, where economic, social, and environmental systems are working together to provide a healthy, productive, and meaningful life for all residents, both present and future.

The SDG Impact Assessment Tool is a free online learning tool that helps to assess how an activity, organization, or innovation might impact the SDGs.

Environmental management tools can be categorized into five types, including cooperative agreements, information disclosure, market-based instruments and fiscal policies, regulations, and voluntary stewardship/corporate environmental responsibility.

Several tools can be used for sustainable development, including sustainable manufacturing tools, life cycle assessment tools, energy efficiency tools, carbon footprint tools, toxic chemicals and pollution prevention,

Proper e-waste disposal does not only help in avoiding environmental pollution and health hazards, but it also has a significant impact on unlocking social and economic benefits within communities. By adopting responsible recycling practices, we can stimulate local economies, create jobs, and foster the growth of a sustainable industry. Possible recycling practices can stimulate local economies, create jobs, and foster the growth of a sustainable industry.

Cultural norms that allow us to neglect the negative impacts of e-waste

Vi. Conclusion

E-waste is becoming a serious problem in India, as discarded electronics harm the environment. It is important to improve products through research and development to encourage reuse and recycling. A framework is needed to manage e-waste, and India has recently drafted rules for e-waste handling, which include the responsibilities of producers, consumers, and recyclers. These rules will be known as "E-waste (Management and Handling) Rules, 2010" and will be implemented from 1st January, 2012. However, it is not enough to just have rules in place, as proper implementation and control are also necessary for effective e-waste management. The Indian government has launched several initiatives, including the Swachh Bharat Mission, Waste to Wealth Mission, Swachh Digital Bharat, Extended Producer Responsibility (EPR), and a co-funded grant scheme to promote environmentally

sound e-waste dismantling and recycling.

Waste to Wealth Mission | Invest India

Invest India

Waste Management in India: Tax Benefits and Incentives to Drive ...

MUNICIPAL SOLID WASTES – The article titled "E-Waste Management in India - Challenges and Strategies" by Hindrise covers various aspects of managing electronic waste in India. In section 57.01 of the article, a scheme is mentioned that offers a financial incentive of 25% on the capital expenditure for a range of electronic goods. These goods include the downstream value chain of electronic products, such as electronic components, semiconductor/display fabrication units, Assembly, Testing, Marking and Packaging (ATMP) units, and specialized sub-units.

In conclusion, traditional economic and industrial approaches often do not align with sustainable development. Rather than choosing between industrialization and the environment, we should focus on selecting patterns of development that improve the quality of the environment. International economic cooperation is crucial in this context, but it cannot be achieved unless nations recognize the relationship between sound environmental management and economic development. We need a more integrated approach to develop an international environment system that responds adequately to the development needs of third-world countries. Growth and economic well-being are prerequisites for sustainable development, and policies and programs that envision sustainable development are fundamental for prosperity. We should always remember Mahatma Gandhi's concept of sustainable development, which states that there is enough in nature to meet human needs, but not human greed and environmental crises. development, which states that there is enough in nature to meet human needs, but not human greed and environmental crises.

E-waste and 2030 Agenda for Sustainable Development:

1. The agenda of 2030 for sustainable development, the Sustainable Development Goals was adopted in September 2015. This agenda consists of the adverse effects of e-waste pollution that have caused a need for sustainable development initiatives. The UN system is coordinating efficient and coordinated actions to support other countries in the proper management of e-waste. The agenda has set the following target goals:
2. SDG Target 3.9: Reduce the number of deaths and illnesses caused by soil, noise, air, water, and e-waste pollution. E-waste contains hazardous chemical substances, and if not disposed of properly, it can harm natural life.
3. SDG Target 8.3: Promote policies that lead to decent job creation, entrepreneurship opportunities, growth, and development of citizens, which results in economic growth. Citizens can be employed by providing the opportunity to manage e-waste properly.
4. SDG Target 8.8: Protect the rights of all workers and labourers, including women workers and migrant workers.
5. SDG Target 12.4: Achieve proper management of chemicals and waste generated throughout their life cycle by 2020, reducing the harmful effects caused by electronic waste.

6. SDG Target 12.5: Reduce waste generation by 2030 through reduction, repair, prevention, recycling, and reuse. Manufacturers can achieve reuse and recycling by utilizing waste generated for other purposes. On, recycling, and reuse. Reuse and recycle can be achieved by the manufacturers by utilizing the waste generated and reusing the same for other purposes.

Reference:

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