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Editorial

The Hierarchy of Hope: Building a Sustainable World One Step at a Time

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The world we live in today is faced with numerous challenges that can often feel overwhelming. From climate change to social inequality, losing hope in our ability to create a better future can be easy. However, a glimmer of hope shines through the darkness of building a sustainable world. At first glance, the idea of achieving a sustainable world may seem like a challenging task. One of the main ways to tackle the problems that threaten our planet is to take one step at a time to make a difference.

The Hierarchy of Hope outlines a roadmap for navigating the path towards a sustainable future. It acknowledges that change cannot happen overnight, but we can make a difference with determination and persistence. Each step in the hierarchy represents a milestone to strive for, serving as a guide towards a more sustainable world.

In this context, the first step in the hierarchy is creating awareness and understanding. We must educate ourselves and others about our challenges and the importance of Sustainability. By spreading knowledge and fostering a sense of urgency, we can build momentum for change. Next, we must advocate for policies and practices that prioritize Sustainability. This includes supporting renewable energy sources, promoting responsible consumption, and encouraging environmentally friendly practices in all aspects of life. By shaping policies and driving innovation, we can create a world that nurtures rather than exploits our precious resources.

On the other hand, collaboration and cooperation are essential in the journey towards Sustainability. To holistically solve our shared challenges, we must unite as a global community, transcending borders and differences. Combining our resources and knowledge can solve complex problems like pollution and deforestation.

The fourth step in the hierarchy is to empower individuals and communities. Learning that we all play a fundamental role in creating a more sustainable world. From individuals making conscious decisions in their daily lives to communities working together to implement sustainable practices, each action helps the group work together.

Finally, we must invest in the future. This encompasses both financial investments and investments in education

and innovation. By dedicating resources to sustainable initiatives, we can pave the way for future generations to thrive in a world that values and safeguards the environment.

The Hierarchy of Hope provides a framework for building a sustainable world, one step at a time. It is a call to action, a reminder that our actions matter and that change is possible. Together, we can create a future where sustainable development is not just a buzzword but also a way of life. Let us enjoy the journey to a better and more hopeful world.

INTRODUCTION

Sustainability means different things to different people. Generally, it is considered a quality of life that ensures the well-being of individuals and societies for the future. For example, production in an area with depleted soil and water resources would not be sustainable. [1] The same is true if a society's overall quality of life declines over time. It is increasingly recognized that sustainable development must encompass three dimensions: the environment, the economy, and society. Sustainable development is needed for all countries, rich and poor. It is used to reconcile two global concerns: the pursuit of long-term economic growth and development and the need to protect the environment. [2] At the same time, it recognizes the needs of people with low incomes, who are often the most vulnerable and have the least power to improve their condition. Long-term social and environmental concerns were translated into strategies for sustainable development with the 1987 Brundtland Report, which included the following definition of sustainable development: "Development that meets the needs of the present without compromising the ability of future generations to meet their needs." This report also shows where the concept of sustainable development was popularized and where the term "sustainability," as we now know it, was first used. This definition is still widely cited today. In which ways does Sustainability affect/inequality influence sustainability? Getting it down on paper, everyone can interpret Sustainability in concrete terms differently. In light of this, it is suggested that it is helpful to view it as a hierarchy with the basic principles at the bottom and more complex concepts building on top of the basics to give governance to the concept of Sustainability. [3]

A suggested hierarchy would be Environmental Sustainability, defined as the ability to maintain rates of renewable resource harvest, pollution creation, and non-renewable resource depletion without compromising the quality of the resource or the ecosystems that provide it. There is more focus on maintaining present as well as future needs.

In the same context, Social Sustainability is applied as the ability of a society to maintain a quality of life that is equitable to all its members. This involves resource and wealth distribution, maintenance of a healthy life and non-compromised development for each individual. Finally, Economic Sustainability is maintaining a particular process or state in economic systems. It is an umbrella term for the "capital" used to create all products. This includes natural, economic, and human resources. [4] The capital should be maintained in its current state, preferably improved. With natural resources, there is a delicate balancing act when extracting a resource, and it should ideally be used up at the same rate that the resource is replenished, e.g., cutting down trees at the same rate that they are replanted.

Definition of Sustainability

A more recent definition of Sustainability has been provided by the World Commission on Environment and Development: "Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their needs." This definition is far less broad than the original concept and ultimately easier to measure and assess. [5]

In today's society, Sustainability seeks to enable the current generation to meet its needs in a way that allows the following generations to meet their needs. This concept comprises three pillars: the environment, society, and economy. These must be upheld both at present and in the foreseeable future. A long-term factor that must be integrated with this is the idea that polluting results from market price, not factoring the cost of environmental damage and resource depletion into the cost of goods and services. If future generations are to meet their needs, they need to be conscious of this and educate themselves on why each decision has an impact, big or small. [6]

Sustainability is an important concept that can be applied across all levels of industry to bring about positive change. This concept originated with the idea that biological systems must remain diverse and produce everything needed for the ecology to remain balanced. This idea that all things in the environment are interdependent is the basic concept of ecology. This has allowed the sustainability concept to evolve to what it is now. [7]

Importance of Sustainability

Sustainability is an incredibly crucial and fundamental consideration for businesses of all sizes. This process provides an invaluable and indispensable opportunity for companies to meticulously and comprehensively evaluate how their operations, practices, and decisions affect the immediate environment, the broader economy, and society as a cohesive whole. It is an indisputable and extensively researched fact that the decisions businesses make today will undoubtedly and inevitably have far-reaching and long-lasting implications. Consequently, an increasing and burgeoning number of conscientious consumers are becoming profoundly concerned and genuinely interested in understanding the impacts and effects of their preferred businesses' decisions. With this heightened and heightened awareness, businesses that take the proactive and proactive steps to critically assess and scrutinize the bigger picture, holistically analyzing and comprehending how their actions and decisions reverberate throughout the environment and society, are generally perceived and regarded in a more favorable light. Moreover, engaging in sustainable practices can also lead to significant and notable financial gains and monetary benefits through the proactive avoidance and prevention of price and damaging Public Relations disasters that can ultimately spell doom for a brand's reputation and gravely impact sales. In today's fiercely competitive and cutthroat market landscape, looking at innovative ways and pioneering strategies to differentiate and distinguish oneself can be unequivocally and unquestionably the pivotal key to resounding and shining success and Sustainability, with its multifaceted and profound implications, can undoubtedly and unequivocally be that defining and differentiating factor that truly propels businesses to soaring and unparalleled heights. [8,9,10]

Environmental Impact

The word "development" has primarily been associated with economic growth, but today, we see numerous negative consequences resulting from "development." This is no more evident than in many MEDCs (More Economically Developed Countries) and LEDCs (Less Economically Developed Countries), in which air and water pollution, deforestation, and biodiversity loss are damaging to the extent that the long-term future development of those nations might not be viable. This is why, today, the long-term Sustainability of our environment has become of utmost importance.

Our society has an intrinsic interest in sustainable development due to the growing realization that humankind needs to manage its impact on the environment better. We have come to understand that long-term development should be achievable by integrating economic activity and the needs of society with effective management and safeguarding of the ecology. This ensures that as we satisfy our present-day needs, we do not compromise our opportunity to satisfy the needs of tomorrow. [11,12]

Sustainability means ensuring the well-being of current generations while preserving the planet's resources and environment for the prosperity of those to come. Three words will be used to illustrate the concept of Sustainability. The environmental, social, and economic aspects are also known as the three pillars of Sustainability. Sustainability is concerned with practicing active conservation so that resources are not depleted. In this regard, the main focus of Sustainability is to create a world in which everyone can have a higher quality of life with enhanced and innovative technologies while not harming the earth's ecosystems. With this in mind, Sustainability is an important concept that can help maintain the quality of life while considering future generations and their needs. [13]

Social Responsibility

Social responsibility is an ethical principle that encourages individuals and organizations to consider the impact of their actions on society as a whole. It emphasizes the importance of contributing to the well-being of people and the environment, recognizing the interconnectedness of economic prosperity and ecological balance. If people's failure

to adhere to social responsibility damages the surrounding society, this is also considered a cost to the economy. Steps may be taken to decrease the damage to societies by implementing laws or standards in a market/industry. Often, it is more effective for the industry to regulate itself. [14] This is termed "self-regulation." Adopting self-regulation and best practices has been demonstrated in various industries and organizations recently and has proven to be a successful business strategy. This will often lead to embracing corporate social responsibility and will help gain public support and a good reputation. The idea of social responsibility is that it is for the individual, whether to benefit himself or the society. Business is an integral part of society, and it is in the interest of business to become an accepted part of society. At this stage, the motive of the business is usually a cost to itself. However, once an accepted part of society is attained, the support it gains will benefit the industry, and the cost is often converted to a long-run investment. With the gained support, legislation may be formed to maintain the benefit of an industry. An example would be the production of UK and EU legislation encouraging companies to adhere to the best environmental practices through various methods, mainly the carrot-and-stick approach. [15]

Economic Benefits

Contrary to popular belief, Sustainability can potentially provide significant and quantifiable returns. Cost savings can be made through resource and energy efficiency. Using less energy, water, and materials reduces costs. It has been suggested that an estimated 20-30% of a company's revenues are spent on resource efficiency. The money saved can often be reinvested into research and development of new technologies or to expand the company. Reducing a company's negative environmental impacts can result in cost savings. Lawsuits, cleanups, and defective products can result in substantial financial losses. A multinational company calculated that reducing GHG emissions and waste by 10-15% could lead to savings of $50-$100 million over 10–15 years. Product innovation is also a clear success driver. Consumers are increasingly looking for green products, opening new markets and increasing profits. The US market for organic foods tripled over 3 years, and prices of organic foods are often 30-40% higher than the conventional alternative. High-performance buildings in construction are seeing a similar trend. It has been reported that "green" building projects are roughly 2% pricier than conventional buildings yet provide yields of 20% more profit and have a 10% increase in profit in the form of return on investment. This is just a starting point as sustainable products or services attempt to "break into" the market in various sectors. [16]

Recent studies have begun to make the business case for the importance of adopting Sustainability. They suggest that implementing sustainability practices will positively affect a company's bottom line. Because a company's economic impact plays a significant role in the current global market, the decision by small or medium-sized companies to incorporate sustainability practices might be restricted due to the potential risk of lost revenue. These companies often reason that training employees, revamping machinery, and developing new technologies are too expensive, all with uncertain outcomes. Larger companies might opt for outsourcing to circumvent the costs. Outsourcing is often a strategy to cut costs, so it can result in overlooking sustainability practices. These practices may save companies money and increase value, competitiveness, and reputation. [17]

Strategies for Sustainable Practices

Waste should be considered an improper resource. Inefficient use of resources, in terms of energy and materials, will increase waste, and the disposal of this waste can cause sustainability problems. Three global environmental issues are intricately linked to waste: 1) Resource depletion, 2) Air pollution and acidification, and 3) Land contamination and waste disposal. In a sustainable system, there would be no waste because each component in the system would complete a life cycle, and all materials would be reused and recycled. Waste reduction and recycling aim to reduce waste volume and hazardous nature by preventing or minimizing adverse environmental and human health impacts. An example of prevention would be redesigning a product to use less material, and an example of minimizing adverse impacts would be extracting recyclable materials from waste and incinerating the rest in an efficient and cleaner combustion process. [18,19]

The concept of renewable energy is essential: if the rate of energy input can be maintained and all else remains constant, there will be no need for resource depletion. Current methods of electricity generation tend to depend on the combustion of fossil fuels, particularly coal. Most scientists and economists believe that the depletion of

fossil fuels and the growing energy requirements of a large population will result in an energy crisis sometime in the next century. A transition to renewable energy is the most logical move and will be one of the ultimate tests of Sustainability. Here, we will analyze the Sustainability of such renewable energy and recommend the most sustainable form for the future.

Renewable Energy Sources

Alcohol fuels can be produced using similar methods to biomass gases and sourced from various crops. Studies have suggested that the most sustainable sources are from sugar cane and grain crops. [20]

Biological energy sources include burning various forms of biomass, mainly wood and dried dung, and alcohol fuels. The environmental impacts of these can be highly variable depending on the source and method of extraction. In some poorer regions of the world, wood is still being extracted unsustainable, leading to deforestation. However, it can have shallow impacts if done sustainably, with replanting equal to extraction. The best biomass fuel for Sustainability is crop wastes and residues, which can be burned or converted into gaseous or liquid fuels. This is because it essentially uses by-products of an existing food source and hence does not require any extra land or water to produce. [21,22]

Studies of the Sustainability of these energy sources find that although there are negative environmental impacts from the manufacturing of the devices to harness this energy and the building of the power stations, they are vastly outweighed by the environmental benefits in the long term. A study comparing the environmental impacts of hydroelectric power with power from a coal-fired station found that hydroelectric power produced four times the energy and used a quarter of the resources, with only a slightly higher impact on global warming potential. This shows that even with the current methods of assessment, which often give a biased view regarding renewable energy, the benefits are still significant. [23]

This section of the essay discusses strategic changes to current practices that can facilitate a movement toward Sustainability. The first of these changes is the embracing of renewable energy sources. These sources can be broken into two main types: biological and mechanical. The mechanical sources include hydroelectric, wind, wave, and solar power. All of these have the commonality that they harness the energy from the sun, either directly or indirectly, to produce electricity.

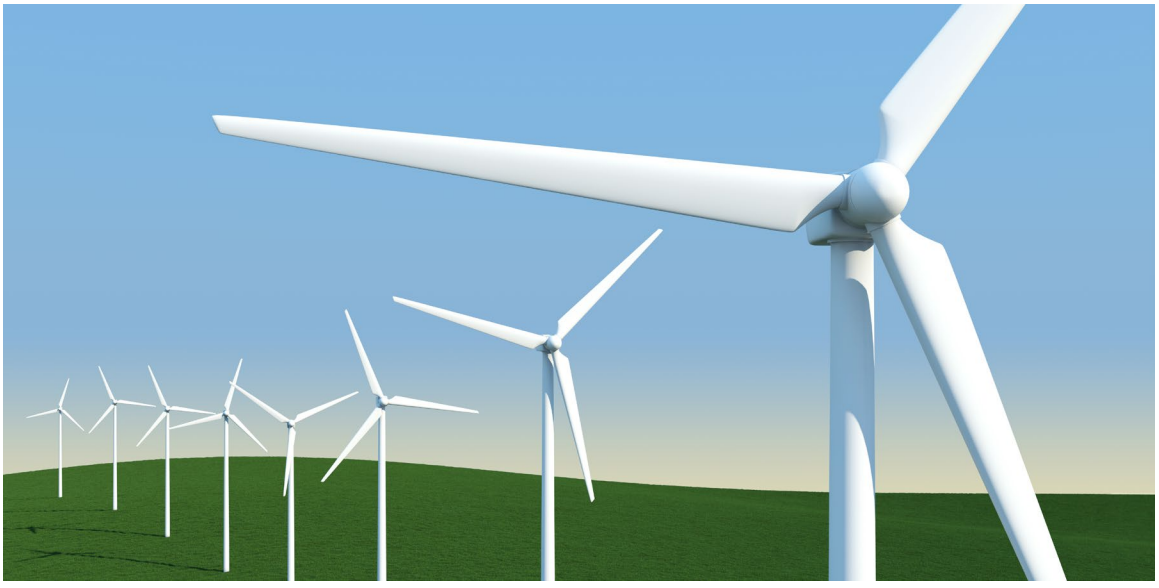

Figure 1. A row of sleek white wind turbines stands like a sentinel over a vast meadow. Each rotation harnesses the power of the wind and transforms it into clean, renewable electricity. The scene is a testament to human ingenuity, using nature's bounty to generate energy for a sustainable future.

Waste Reduction and Recycling

Unfortunately, there are many barriers to recycling, some of which involve an initial recycling effort, consumer support or lack thereof, and the quality of the material. Often, it is cheaper to manufacture virgin materials than recycle, which translates into a need to use or provide subsidies to make recycling economically feasible. Economic efficiency can also be achieved by imposing government laws and restrictions that require manufacturers to use specified recycled materials. To ensure that the correct materials are available, the government can use its purchasing power to require and, in turn, enable the development of recycled products. [24]

Recycling involves transforming discarded materials into new products. This process not only prevents the loss of valuable resources but also diminishes the demand for raw materials, cuts down on energy consumption, and mitigates air and water pollution caused by waste disposal methods like incineration and landfilling. Furthermore, recycling significantly reduces greenhouse gas emissions compared to manufacturing products from scratch. However, it is crucial to note that there is a difference between collecting materials for recycling and the actual process of recycling them into new products. [25]

Reusing and recycling things can save valuable resources from being thrown away. Recycling one ton of paper can save 17 trees, 400 gallons of oil, and 7000 gallons (ca. 26 m^3) of water. With so much being said about recycling—glass, aluminum, paper, and plastic—the economic or environmental benefits are still not understood by many. Although there is plenty of information on the advantages, little is known about the barriers to recycling, particularly glass recycling. [26]

Conservation of Resources

In the case of non-renewable resources, saving them is not always possible, but the next best thing is to have a suitable replacement. Although losing a particular resource may be inevitable, research into alternative materials may provide one less environmentally damaging. At the same time, it is often possible to stock up on a particular resource and use a small quantity to fulfill its essential needs. With the saved resources, it is again possible to slowly integrate the alternative material into an existing product when research and development have led to a superior replacement for the new standard. Stepwise transitions such as these are an effective way to reduce the environmental impact of industry. Finally, an alternative material may be derived from a renewable resource, which, in an ideal world, would be the only source for any material, as in the case of plastics and biopolymers. [27]

The most straightforward conservation method is to stop wasting resources in the first place. This will come about automatically if people use resources more efficiently. For example, greater fuel efficiency in vehicles will save money by using less fuel while saving resources for a time when it may not be economically viable to run internal combustion engines. Currently, the approach is not to save the non-renewable resources but to use them until they are all gone, throwing them away at the same time as the considerable environmental cost given that the resources are usually toxic and harmful if left to rot. An excellent example is the vast quantities of heavy metals mined for use in industry and consumer goods, but a large percentage of what is mined is wasted through inefficient processing and perhaps lavish usage where more common materials would suffice. These resources are usually never recovered and are left to pollute the environment at the various stages of their product life cycles. By improving process efficiency and using materials only where necessary, it is possible to reduce the quantity of these resources used. A great way to encourage resource efficiency is to assign a cost to all resources used, and while this is generally true for most raw materials, it is not the case when considering energy. After all, this cost is what we are trying to avoid with renewable energy. By having clearly defined resource and material budgets, the industry will be more accountable for what it uses, which will ultimately mean better management of resources. A good tool for all these issues is the concept of life cycle assessment for products and materials, which assesses the impact of these things on the environment and society from their creation to their disposal. [27]

A much better method of dealing with our planet's finite resources than continually replacing them with alternates would be to conserve them in the first place by being more frugal in our use of them. Non-renewable resources such as fossil fuels will eventually run out if they continue to be used at the current global rate. These resources

must be conserved so that there is an alternative available should they catastrophically fail in the search for new energy technologies and so that there is an abundance of time during the transition process from old to new energy technology for intensive research and development of the new technologies to ensure quality and reliability. This same principle applies to other non-renewable resources; for example, the transition from a petrol-fueled transport system to an electric one would require a large amount of copper to make the wiring of a precious resource which we use far too much of for less important things and of which there is a minimal supply. By conserving the resources now with efficient use and recycling, there is more of a chance that we can have a better quality of life and a higher standard of living. Think of it as ensuring a comfortable future by not squandering the inheritance. [28]

Sustainable Agriculture

Several recent scientific developments provide hope for lessening agriculture's environmental impact. One of these is the development of genetically modified (GM) crops. The technology involved in genetic modification allows for the development of crops with increased resistance to pests and diseases. This, in turn, reduces the need for pesticide applications. GM crops can also be developed with a higher nutrient content, and the modification of rice to provide vitamin A is one current example. [26] This technology has the potential to significantly reduce malnutrition in many parts of the world. However, releasing GM crops into the environment carries several risks and unknowns. These include gene transfer to non-modified plants, resistance of target organisms to crop defenses, and effects on non-target organisms. As such, the potential benefits of GM crops are overshadowed by the possibility of long-term and irreversible damage to the environment and human health. Current international regulations on the release of GM organisms are insufficient, and it is unclear whether the precautionary principle is being followed at this stage in the technology's development. [29]

Figure 2. Agriculture is the most basic way in which humans alter the environment. It remains essential not only for food but also for the production of raw materials for industry, as well as for providing employment opportunities. Although subsistence and intensive agriculture can be practiced sustainably, intensive systems with a high input of pesticides and fertilizers are often detrimental to the environment. This constitutes a substantial portion of agriculture in developed nations, and it is in these systems that the transition to sustainable agriculture is most urgent. [30]

Challenges and Future Outlook

A promising aspect of the future of Sustainability is the potential for technology to bridge the gap between unsustainable practices and sustainable alternatives. Many solutions to sustainable consumption and production lie not in further abstinence and conservation but in more efficient and less environmentally damaging technologies. At present, this is the very definition of Sustainability, which is to meet the needs of the present without compromising the needs of the future. An example is the energy sector, where coal and oil are the prominent power sources. Renewable energy technologies are not yet competitive in cost and production, and nuclear power is contentious due to waste disposal and risk issues. However, continued research can potentially change this situation comparatively quickly. For example, a breakthrough in the efficiency and cost of production for solar power would soon make it a viable alternative to fossil fuels. This transitional technology improved sustainable alternatives, which are very close to being more economically and ecologically sound. Step change energy technology is a common feature in the history of industry. A global industry funding the right research areas to replace outdated or damaging technologies with sustainable alternatives may be the cornerstone of a sustainable future. [31]

There are significant challenges to achieving global Sustainability and the outlook for the future. Overcoming the resistance to change from comfortable but unsustainable practices will be a significant challenge. Whether shifting from fossil fuels to more sustainable energy sources or reducing wasteful and damaging consumption habits, this change will meet strong resistance from those who gain from the present state of things. On the national and international political stage, the globalization of free market ideologies will continue to push an unsustainable production and consumption agenda. The burden will fall on the proponents of Sustainability to show that their path is more economically and ecologically sound. This will be a complex argument in the short term, where economics often only considers factors with a dollar value, and in the long term, where environmental damage is often challenging to foresee by a public not well-educated in ecological processes. The proponents of Sustainability often face the problem of proving a negative; in such cases, the argument is complicated to win. [29,32]

Overcoming Resistance to Change

There is considerable controversy over the most effective strategy for transitioning to Sustainability. There is, for example, a long-running debate between those who believe that in the modern world, the environment only prospers when economic development is prioritized and those who believe that the environment can only be preserved for future generations by constraining economic and technological growth. This debate is one of strategy, but often, it is a polarization of interests that makes sustainability transition so tricky. This is not a simple or singular problem. Instead, a complex web of socio-economic processes is contributing to environmental degradation.

Sustainability is a critical issue for humanity in the 21st century. Many problems remain to be solved, and the issues are becoming increasingly complex in a globalized world. Assuming these problems result from an imbalance between global social, economic, and environmental systems, creating a sustainable world involves transitioning to Sustainability from present conditions. This transition will involve technological and economic infrastructure changes, as well as changes in the behavior of individuals and institutions. Transitions are problematic because of the complexity of systems, the vested interests of those who have power in present systems, and the limits of our understanding and ability to control events at the levels and over the time spans involved. [33]

Technology Advancements

Overall, the importance and potential of technology are evident in providing particularly hopeful solutions to the types of problems we are currently faced with. However, it must be understood that it is a tool subservient to human intent. It will not serve its purpose without an active intent and effort to direct it towards sustainable goals and create environments conducive to its development. [27]

In addition, there is a parallel between sustainable development and the implementation of appropriate policy and institutional frameworks to encourage innovation in technology's development and uptake. Technology has to be created in a market that has demanding sustainability objectives. Furthermore, in turn, certain technologies have the potential to provide essential solutions to issues of development and poverty in places such as health, resource provision, and environmental management. Nevertheless, without specific rules, incentives, and disincentives, there is no guarantee that unsustainable practices will not simply continue. [34]

While acknowledging the potential for technology, it is crucial to recognize that its development is not automatic and may take a long time. It is essential to be realistic about the potential capabilities and time frames of technologies and to utilize what we have now where possible. This is especially so for developing countries, who may put too much faith and resources into new technologies when solutions are often available to them now through more straightforward changes in their infrastructure and societal frameworks. [27,35,33]

Technology also provides more sustainable solutions to people's and communities' everyday problems and activities. An example is the development of fuel cell and hydrogen energy technologies, which are highly efficient and produce little pollution. If successful, these could provide alternative, cleaner energy sources to the many Third World countries currently dependent on wood and other biomass fuels. The same goal is for some renewable energy technologies, such as solar or wind power, which are still not as efficient or cheap as the less sustainable alternatives. The development of more efficient energy and cost-effective technologies has the potential to 'lift' people out of unsustainable resource and energy usage traps into more sustainable patterns. [34,33]

As an improvement example, Singapore is a country that has faced severe pollution and resource usage problems due to industrialization. Through the advancement and transfer to cleaner, more efficient production processes and waste minimization technologies that better utilize resources, they reduced pollution and the strain on resources despite continuing to grow economically. [33,27,34]

Technology advancements have been and still are one of the most significant sources of hope for sustainable development. They provide an essential opportunity to improve resource productivity and reduce environmental impact. Development and improvement of technology will result in reduced costs as efficiency is improved and new methods/spaces of production are discovered. [36,35]

Global Collaboration for Sustainability

In September 2000, a historic assembly of world leaders convened at the United Nations headquarters in New York City. Their purpose was to formally adopt the United Nations Millennium Declaration, a groundbreaking agreement pledging their countries to collaborate globally to combat extreme poverty. The declaration also established a set of specific goals, each with a clear deadline of 2015, aimed at improving the lives of millions worldwide. That has become known as the Millennium Development Goals. Achieving these goals would result in a more sustainable approach to growth and development that considers the needs of future generations.

Agenda 21 is the comprehensive blueprint of action to be taken globally, nationally, and locally by UN (United Nations) organizations, governments, and major groups in every area where humans directly affect the environment. This was a significant step forward in promoting Sustainability. However, more recently, it has occurred under a different guise.

One of the first attempts at a global level to address the issues of Sustainability was the Earth Summit in Rio de Janeiro in 1992. At the summit, leaders from 178 nations met and discussed what has been described as a "sustainable development" path for the planet. There were several agreements signed by many of the countries, with the three main ones being the Rio Declaration on Environment and Development, the Statement of Forest Principles, and, more famously, Agenda [21].

Collaboration and communication among various countries will be crucial for the success of individual policy changes. Governments can learn a lot from each other if they were to share their experiences with different policy instruments. Learning from the experiences of others can eventually save time and resources.

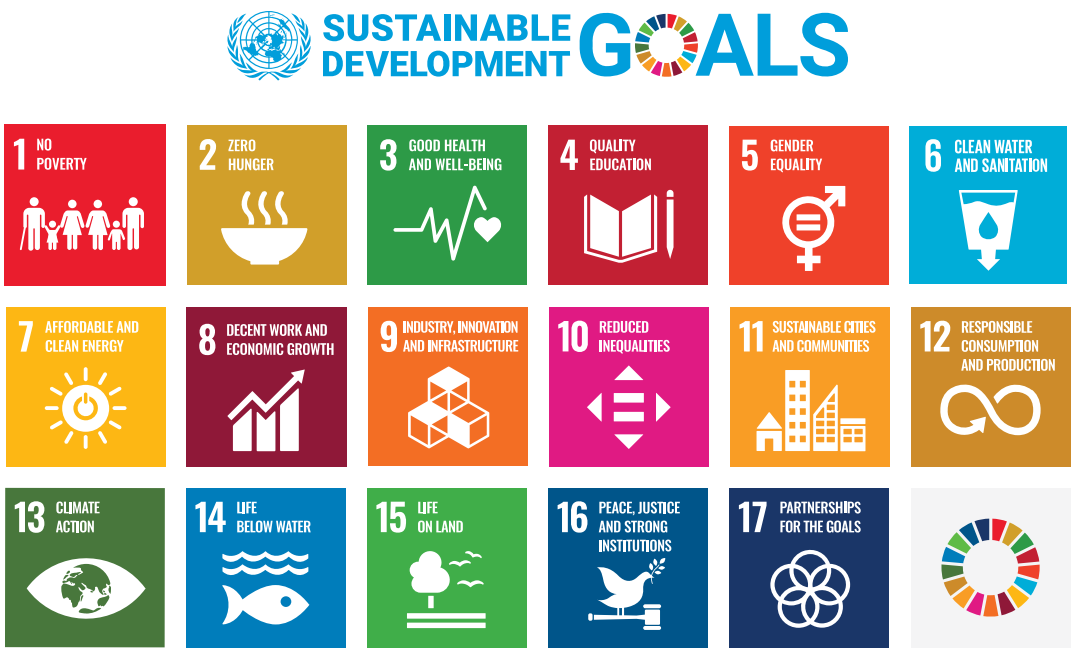

Figure 3. The United Nations (UN), sustainable development agenda encompasses an extensive set of goals and targets to promote robust economic prosperity, foster deep-rooted social inclusion, and ensure enduring environmental Sustainability. This comprehensive agenda significantly acknowledges and appreciates the intricate interconnectedness of the myriad global challenges we face and emphatically emphasizes the urgent need for a comprehensive and holistic approach to effectively and efficiently address them.

CONCLUSIONS

Sustainability is a complex concept that requires balancing environmental protection, social equity, and economic development. It is essential to consider the needs of the present without compromising the ability of future generations to meet their needs.

The sustainability concept is broken down into three pillars: the environmental, the social, and the economic. While Environmental Sustainability focuses on preserving natural resources and ecosystems, Social Sustainability ensures a high quality of life and equitable distribution of resources for all members of society. Economic Sustainability involves maintaining a process or state in economic systems where resources are used efficiently.

There are many challenges to achieving Global Sustainability, such as overcoming resistance to change and developing new technologies. However, there are also promising solutions, such as renewable energy sources and waste reduction strategies. Global collaboration is essential to reach a sustainable future.

REFERENCES

1. Wang X. Managing land carrying capacity: Key to achieving sustainable production systems for food security. Land. 2022. mdpi.com

2. Rugger CA. Sustainability and sustainable development: A review of principles and definitions. Science of the Total Environment. 2021. [HTML]

3. Hajian M, Kashani SJ. Evolution of the concept of Sustainability. From Brundtland Report to sustainable development goals. Sustainable resource management. 2021. [HTML]

4. Almalki FA, Alsamhi SH, Sahal R, Hassan J, Hawbani A, Rajput NS, Saif A, Morgan J, Breslin J. Green IoT for eco-friendly and sustainable smart cities: future directions and opportunities. Mobile Networks and Applications. 2023 Feb;28(1):178-202. springer.com

5. Sakalasooriya N. Conceptual analysis of Sustainability and sustainable development. Open Journal of Social Sciences. 2021. scirp.org

6. Valdivia S, Backes JG, Traverso M, Sonnemann G, Cucurachi S, Guinée JB, Schaubroeck T, Finkbeiner M, Leroy-Parmentier N, Ugaya C, Peña C. Principles for the application of life cycle sustainability assessment. The International Journal of Life Cycle Assessment. 2021 Sep;26(9):1900-5. springer.com

7. Miceli A, Hagen B, Riccardi MP, Sotti F, Settembre-Blundo D. Thriving, not just surviving in changing times: How Sustainability, agility and digitalization intertwine with organizational resilience. Sustainability. 2021 Feb 14;13(4):2052. mdpi.com

8. Tien NH, Anh DB, Ngoc NM. Corporate financial performance due to sustainable development in Vietnam. Corporate social responsibility and environmental management. 2020 Mar;27(2):694-705. researchgate.net

9. Bartolacci F, Caputo A, Soverchia M. Sustainability and financial performance of small and medium sized enterprises: A bibliometric and systematic literature review. Business Strategy and the Environment. 2020 Mar;29(3):1297-309. academia.edu

10. Raimo N, Caragnano A, Zito M, Vitolla F, Mariani M. Extending the benefits of ESG disclosure: The effect on the cost of debt financing. Corporate Social Responsibility and Environmental Management. 2021 Jul;28(4):1412-21. [HTML]

11. Kolawole AS, Iyiola AO. Environmental pollution: threats, impact on biodiversity, and protection strategies. InSustainable Utilization and Conservation of Africa's Biological Resources and Environment 2023 Apr 18 (pp. 377-409). Singapore: Springer Nature Singapore. academia.edu

12. Ukaogo PO, Ewuzie U, Onwuka CV. Environmental pollution: causes, effects, and the remedies. InMicroorganisms for sustainable environment and health 2020 Jan 1 (pp. 419-429). Elsevier. [HTML]

13. Kopnina H. Education for the future? Critical evaluation of education for sustainable development goals. The Journal of Environmental Education. 2020. researchgate.net

14. Lu J, Liang M, Zhang C, Rong D, Guan H, Mazeikaite K, Streimikis J. Assessment of corporate social responsibility by addressing sustainable development goals. Corporate Social Responsibility and Environmental Management. 2021 Mar;28(2):686-703. [HTML]

15. Hagger MS, Orbell S. The common sense model of illness self-regulation: a conceptual review and proposed extended model. Health psychology review. 2022. tandfonline.com

16. Zakari A, Khan I, Tan D, Alvarado R et al. Energy efficiency and sustainable development goals (SDGs). Energy. 2022. [HTML]

17. Jayashree S, Reza MN, Malarvizhi CA, Mohiuddin M. Industry 4.0 implementation and Triple Bottom Line sustainability: An empirical study on small and medium manufacturing firms. Heliyon. 2021 Aug 1;7(8). cell.com

18. Iqbal A, Liu X, Chen GH. Municipal solid waste: Review of best practices in application of life cycle assessment and sustainable management techniques. Science of The Total Environment. 2020. [HTML]

19. Istrate IR, Iribarren D, Gálvez-Martos JL, Dufour J. Review of life-cycle environmental consequences of waste-to-energy solutions on the municipal solid waste management system. Resources, conservation and recycling. 2020 Jun 1;157:104778. [HTML]

20. Magda R, Szlovak S, Toth J. The role of using bioalcohol fuels in sustainable development. Bio-Economy and Agri-production. 2021. [HTML]

21. Richardson SB, Simeone JC, Deklerck V. The global wood species priority list: a living database of tree species most at risk for illegal logging, unsustainable deforestation, and high rates of trade globally. Wood and Fiber Science. 2023. swst.org

22. Nambiar EKS. Small forest growers in tropical landscapes should be embraced as partners for Green-growth: Increase wood supply, restore land, reduce poverty, and …. Trees. . sciencedirect.com

23. Rahman A, Farrok O, Haque MM. Environmental impact of renewable energy source based electrical power plants: Solar, wind, hydroelectric, biomass, geothermal, tidal, ocean, and osmotic. Renewable and Sustainable Energy Reviews. 2022 Jun 1;161:112279. [HTML]

24. Sun L, Wang Y, Hua G, Cheng TC, Dong J. Virgin or recycled? Optimal pricing of 3D printing platform and material suppliers in a closed-loop competitive circular supply chain. Resources, Conservation and Recycling. 2020 Nov 1;162:105035. [HTML]

25. Adegbeye MJ, Reddy PR, Obaisi AI, Elghandour MM, Oyebamiji KJ, Salem AZ, Morakinyo-Fasipe OT, Cipriano-Salazar M, Camacho-Díaz LM. Sustainable agriculture options for production, greenhouse gasses and pollution alleviation, and nutrient recycling in emerging and transitional nations-An overview. Journal of Cleaner Production. 2020 Jan 1;242:118319. academia.edu

26. Kumar V, Gupta S, Kalra JS, Patil PP. Improvement in quality of handmade paper materials by recycling of waste papers and PPE kits. Materials Today: Proceedings. 2021. [HTML]

27. Lei W, Pei H, Fang C, Zhou X, Zhang X, Pu M. Influence of nanocrystalline cellulose extracted from different precursors on properties of polyurethane elastomer composites. Composites Science and Technology. 2022 Feb 8;218:109159. [HTML]

28. Gupta S, Kumar V, Behera A. Study On Quality Of Material Made By Waste Agriculture And Packing Paper Materials. Ilkogretim Online. 2021. archive.org

29. Friedemann A. Life after fossil fuels. Cham: Springer International Publishing. 2021. [HTML]

30. TOMORROW AG. Sustainability report. 2023. usps.com

31. Kalra J, Kumar V, Gupta S. The Waste Paper Management in Educational Institutes and Improvement in Quality of Handmade Papers: A Step Towards Environmental Conservation. International Journal of Social Ecology and Sustainable Development (IJSESD). 2022 Jan 1;13(1):1-0. [HTML]

32. Ntifafa YP. Enzymatic Approach To Improve Tensile, Freeness And Brightness. 2021. und.edu

33. Montoya JP, Alvarez YC, De Magalhães RF, Lermen FH. A thermo-economic analysis of a circular economy model for biomass in South America producing biofertilizers and biogas from municipal solid waste. Renewable Energy. 2024 May 1;225:120254. [HTML]

34. Kurnia JC, Shatri MS, Putra ZA, Zaini J, Caesarendra W, Sasmito AP. Geothermal energy extraction using abandoned oil and gas wells: Techno-economic and policy review. International Journal of Energy Research. 2022 Jan;46(1):28-60. [HTML]

35. Mariñas ES, Manaois RA, Jose AB, Mandin MA. Vision In Action: The Impact of Sustainable Practices of Philippine School Doha on the Students' Move Towards Youth Environmentalism. Vision In Action: The Impact of Sustainable Practices of Philippine School Doha on the Students' Move Towards Youth Environmentalism. 2022 Feb 20;95(1):18-. researchgate.net

36. Pandey S, Gupta S. Exploring laccase: a sustainable enzymatic solution for the paper recycling domain. Archives of Microbiology. 2024. [HTML]

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