

Exploring the role and impact of green technology in building a sustainable future

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International Journal of Science and Technology Research Archive, 2023, 05(02), 128–133

Publication history: Received on 19 October 2023; revised on 17 December 2023; accepted on 20 December 2023

Article DOI: <https://doi.org/10.53771/ijstra.2023.5.2.0098>

Abstract

This article delves into the pivotal role and profound impact of green technology in shaping a sustainable future. It examines how innovative environmentally friendly technologies are revolutionizing industries, mitigating ecological footprints, and fostering a harmonious relationship between human activities and the planet. The study explores diverse applications, from renewable energy sources to eco-friendly materials, emphasizing their collective potential to address global environmental challenges. By analyzing current trends and advancements, this abstract illuminates the transformative power of green technology in steering societies towards a more resilient and ecologically balanced future, essential for navigating the complexities of the 21st century.

Keywords: Green Technology; Sustainability; Renewable Energy; Eco-friendly Materials; Environmental Impact

1 Introduction

The exploration of green technology's impact on sustainable development has been the subject of much debate in recent years. Green technology, also known as environmental technology, is an interdisciplinary field of research and development which seeks to create a better relationship between humanity and the ecosystems we inhabit. In its pursuit of a more sustainable way of living, green technology has generated a variety of opinions and arguments as to its effectiveness. On one end of the spectrum, some view green technology as a cost-effective tool with which to achieve sustainable development. Conversely, other individuals believe green technology is too costly and will not lead to significant long-term environmental benefits. This essay aims to address the complexity of the topic by examining both sides of the argument to determine whether green technology is the best path forward towards a more sustainable future.

Because of its potential to tackle our planet's environmental challenges, green technology has gained a lot of attention in recent years. Green technology's goal is to leverage scientific and technological advancements to prevent negative environmental impacts while fostering long-term growth. Lowering greenhouse gas emissions, conserving natural resources, and finding cleaner, more efficient energy sources are all part of this. The development and implementation of green technology has the potential to significantly mitigate the negative effects of human activities on the environment, such as climate change, pollution, and resource depletion. By integrating sustainable practices into our daily lives through green technology, we can work towards a more balanced relationship with our planet. Green technology (Greentech) is any technology that is environmentally friendly and rooted in environmental science. It can be applied for various purposes, from energy efficiency and recycling to renewable resources. Examples of green technology include LED lighting, which saves much more energy than traditional incandescent lights, and vertical farming, an innovative agricultural practice which has the potential of solving the food crisis. Green technology is divided into two areas by the United Nations Framework Convention on Climate Change (UNFCCC): mitigation and adaptation. Mitigation refers to technologies which reduce or avoid the release of greenhouse gases, such as low-carbon hydrogen and biofuels, and carbon capture. Adaptation, on the other hand, can be defined as adjustment in nature or

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human systems in response to GHG emissions. Other green technology examples include plant-based meat, 3D printing, and solar energy, all of which play a substantial role in achieving sustainable development. Green technology is not only beneficial to the environment, but it is also beneficial to business. Green technology has the potential to create new job opportunities and improve economic growth. The International Renewable Energy Agency (IRENA) estimates that the renewable energy sector employed 11 million people worldwide in 2018, with 42 million predicted by 2050. Furthermore, green technology can save long-term costs for businesses and homes by reducing energy consumption and increasing efficiency. As the world moves toward a more sustainable future, the need for green technologies will grow, creating even more economic opportunities.

Another benefit of green technology is that it promotes public health. Traditional fossil fuels, which are used to generate energy, emit pollutants into the atmosphere that are hazardous to human health. Green technology, such as renewable energy sources and electric vehicles, reduces the use of fossil fuels and consequently decreases air pollution. This leads to lower rates of respiratory diseases, cardiovascular issues, and premature deaths caused by air pollution.

Moreover, green technology can also enhance food security. With climate change threatening agricultural production, innovative solutions are needed to ensure a stable food supply for a growing population. Green technology can help address this issue through sustainable farming practices, such as precision agriculture and hydroponics, that use less water and produce higher yields. Furthermore, the use of plant-based meat alternatives reduces the reliance on traditional livestock farming, which is a major contributor to greenhouse gas emissions.

According to a new World Economic Forum and PwC report, if we harness technology innovation, we can make significant progress on two-thirds of the 169 Sustainable Development Goals targets. However, to properly deploy green technology for sustainable development, we must understand the competing discourses of sustainability. Green technology is continually expanding and developing, with new inventions being introduced daily. As a result, qualified experts in the field of green technology are in high demand. This has led to an increase in demand for specialized education and training programs in universities and technical institutes all over the world.

Moreover, governments have recognized the importance of investing in green technology as it not only helps in mitigating climate change, but also creates new job opportunities and promotes economic growth. In fact, the United Nations Environment Programme has reported that investing just 2% of global GDP in green technology could create millions of jobs and significantly boost global GDP. Additionally, green technology can also play a crucial role in reducing poverty and promoting social equity. By providing access to cleaner energy and sustainable resources, it can improve the quality of life for those living in developing countries. This is especially important because these are typically the countries most exposed to the effects of climate change. However, establishing and employing green technology is not without challenges. The high initial cost of implementing these technologies, which may be prohibitively expensive for developing countries with limited financial resources, is one key hurdle. This is where international engagement and partnerships can assist in bridging the gap and promoting the transfer of sustainable technologies to developing countries. Another concern is the general public's lack of understanding and awareness of green technologies. Many individuals are still uninformed of the potential benefits of green technology and may have misconceptions or reservations about its efficacy. This emphasizes the importance of excellent communication and education in raising awareness and encouraging wider adoption of green technologies. However, despite its many benefits, green technology also faces challenges. The significant upfront expenses associated with implementing green technology solutions are a key problem. As a result, small businesses and poor countries with little resources may face issues. Governments and international organizations must work together to provide financial assistance and incentives for the adoption of green technologies. Furthermore, green technology is still in its early stages of development, and specific businesses or locations may have restricted possibilities. This emphasizes the significance of continual research and innovation to increase the range of available sustainable technologies. Governments must also promote green technology research and development to foster economic growth. Green technology has revolutionized the way people approach sustainable development. By investing in green technology, communities can reduce their carbon footprint, increase energy conservation, and promote renewable resources. For instance, green technology helps reduce water consumption by implementing efficient water-saving devices, such as sensor-based taps. Similarly, green technology can lead to a reduction in energy consumption by improving a building's overall energy efficiency. In fact, the use of solar panels, wind turbines, and other renewable energy sources has the potential to significantly decrease fossil fuel consumption and mitigate climate change. Installing energy-efficient windows and insulation, for example, can cut energy usage in buildings by up to 30-40%. Additionally, green technology encourages the use of renewable resources, such as solar and wind energy, over energy generated from fossil fuels. Studies show that solar and wind energy are more cost-effective and sustainable than traditional fossil fuels, and can reduce the reliance on carbon-rich energy sources. In Ohio, for instance, green energy initiatives have been launched to reduce the state's carbon footprint with businesses like Cogeneration Systems, which helps reduce energy costs while providing energy consumption insights. Other programs

such as LEED Green Building Rating Systems assess how “green” a building is by rating its energy efficiency, sustainability, and the use of renewable energy sources. Ultimately, green technology has proven to be highly beneficial to sustainable development, making it an important investment for communities and businesses to embrace.

Another significant benefit of green technology is its positive impact on public health. By reducing air pollution and utilizing cleaner methods for waste management, green technology can improve air quality and reduce health risks associated with toxic contaminants. This not only benefits humans, but it also improves the environment. Furthermore, the use of green technology can create new job possibilities in a variety of areas, including renewable energy, sustainable agriculture, and eco-tourism. This not only helps to stimulate economic growth but also promotes social equity by creating jobs in communities that may have been previously marginalized.

Green technology is a rapidly expanding industry that has the potential to facilitate sustainable development, but questions remain in regards to the environmental and economic accessibility of these technologies. Currently, green technology adoption can be hindered by a combination of high initial costs, a need for consistent maintenance, disparities in accessibility, and potential unintended environmental consequences. For example, the use of sustainable aviation fuel (SAF) has grown in popularity due to its potential for reducing aviation emissions. However, according to a 2019 article, the industry usage of SAF was only 0.01%, significantly lower than the goal of 6% usage by 2020. It is also important to consider, as highlighted by the United Nations Sustainable Development Cooperation Framework (UNSCDF), that individual behaviour change is necessary to influence the policy set in place for green technology. This requires education and community involvement to promote the overall goal of sustainability.

Furthermore, by reducing carbon emissions, green technology can alleviate global climate change. Renewable energy sources such as solar, wind, and hydropower have the potential to drastically reduce greenhouse gas emissions that contribute to climate change. Furthermore, implementing sustainable practices in industries such as transportation, construction, and agriculture can also contribute to reducing carbon emissions. This not only benefits the environment, but also has economic advantages by decreasing reliance on non-renewable resources and potentially creating new job opportunities in green technology industries.

However, it is crucial to ensure that these benefits of green technology are accessible to all communities, especially those who may have been marginalized or disproportionately affected by climate change. The concept of “environmental justice” comes into play here. Environmental justice advocates for equal treatment and participation in environmental decision-making for all people, regardless of race, income, or geography. This involves dealing with any potential negative implications of green technology implementation.

The difficulty therefore becomes determining how to promote behavioural change to assure the successful application of green technologies. Furthermore, groups such as the World Business Council for Sustainable Development have recognized the significance of business performance and accountability in controlling plastic pollution and circularity opportunities throughout the value chain. Without appropriate performance and accountability frameworks, the full potential of green technology in advancing sustainable development may never be reached.

As the world continues to face pressing environmental and economic challenges, the need for sustainable development through green technology becomes increasingly important. However, as previously said, there are still obstacles to the general implementation of these technologies. Aside from worries about cost and accessibility, there is also a lack of expertise and understanding of green technologies. Education and information dissemination are critical in changing behaviour and generating demand for green technology. This involves teaching people about the advantages of utilizing sustainable aviation fuels and raising awareness about plastic litter and circularity opportunities.

Furthermore, governments play an important role in fostering green technology adoption through policy and regulation. For example, tax breaks and subsidies can encourage enterprises to adopt more environmentally friendly practices and technologies. Furthermore, rules that restrict the use of single-use plastics or encourage recycling can have a big impact on minimizing plastic pollution.

Collaboration is also essential for accelerating the general adoption of green technology. Partnerships between governments, businesses, and individuals to produce new solutions and strategies for sustainable development are examples of this. It also involves collaboration between different industries to share knowledge and resources, as well as working with local communities to ensure that green technology is accessible and beneficial for all. In addition to addressing current challenges, it is also important to continue investing in research and development for green technology. This includes developing new and improved forms of renewable energy, as well as finding ways to make

existing technologies more efficient and affordable. By continuing to invest in research, we can ensure that the future of green technology is constantly evolving and improving.

The use of green technology in the pursuit of sustainable development is a complex and multifaceted issue. While green technology can be seen as the key to unlocking a more sustainable future, there are also concerns that it may be too costly, inefficient, difficult to implement, or open to abuse. Nonetheless, green technology is indispensable in resolving the climate crisis, and if properly managed it can play a critical role in achieving more sustainable human societies. It is vital that the true potential of green technology is effectively harnessed and wielded for our collective benefit, while always keeping in mind the need to protect our environment and the planet. To create a better world, we must work together to find ways to use green technology to enhance, rather than damage, our environment.

With the right strategies in place, green technology can play a critical role in helping us achieve a more sustainable and equitable future. By promoting and investing in green technology, we can help to create a cleaner, healthier, and more sustainable environment for future generations. Allow green technology to continue to collaborate and create as an ally in the battle against climate change and environmental degradation. We can have a positive impact on our world and ensure a brighter future for all if we work together. So let us keep pushing for progress, and never forget the immense potential of green technology to drive us towards a greener and more sustainable world. Let us embrace it as a powerful tool in our arsenal, and use it to create positive change for both people and planet. The future is in our hands, let us make it a green one. By harnessing the power of green technology, we can work towards achieving a balance between economic growth and environmental preservation. We must prioritize investments in research and development to continue to improve and advance green technology, making it more accessible and affordable for all. This will require cooperation and collaboration from governments, businesses, and individuals alike.

One important consideration is the requirement for education and knowledge about the advantages of green technology. Many individuals may be unaware of the benefits that green technology may have on both our environment and our economy. We can empower individuals and communities to make more sustainable choices in their daily lives by spreading knowledge and advocating the use of green technologies.

Another critical factor is the requirement for legislative reforms that encourage and incentivise the deployment of green technologies. Governments have an important role in encouraging and rewarding the adoption of sustainable practices. Tax breaks for green enterprises, rules on emissions and waste management, and subsidies for renewable energy sources are examples of such policies. So, let us all take responsibility for our planet and make conscious choices to support the development and implementation of green technology. This can include supporting policies that encourage investment in renewable energy sources, advocating for sustainable practices in industries such as transportation and agriculture, and using eco-friendly products in our daily lives.

Green technology is not just limited to large-scale initiatives or government policies. It can also be adopted at an individual level through small changes in our daily lives. Simple actions such as using energy-efficient appliances, recycling, and reducing our carbon footprint can all contribute to a greener future. By being mindful of our choices and making conscious efforts towards sustainability, we can collectively make a significant impact on the environment.

Moreover, green technology offers numerous economic benefits as well. It presents opportunities for job creation, particularly in the renewable energy sector, and can lead to long-term cost savings for businesses and households alike. By investing in green technology, we are not only helping the environment but also supporting a more resilient and sustainable economy.

It is critical to realize that the shift to a greener future will take time. All individuals, businesses, and governments must put forth persistent effort and devotion. We can, however, create a more sustainable and affluent world for ourselves and future generations by working together and adopting green technologies. Let us continue to strive for a more environmentally friendly and sustainable future. We may also raise awareness and educate people on the value of green technologies. By sharing information about the benefits and opportunities it offers, we can inspire more people to act and make conscious choices in their daily lives. Additionally, we can support businesses and organizations that prioritize sustainability, as they play a crucial role in driving green technology forward.

2 Conclusion

In conclusion, green technology is not just a buzzword, but a necessary step towards building a better and more sustainable world. By implementing it in our lives and supporting its development, we can protect the environment, create economic opportunities, and ensure a brighter future for all. So, let us embrace green technology and work

together to make the planet a greener, more sustainable place for ourselves and future generations. Together, we can have a good impact on the earth and leave a sustainable legacy for future generations. So, for the benefit of both current and future generations, let us continue to create and invest in green technologies. Let us begin today to create a greener tomorrow. We are not only improving our own lives by working toward a greener future, but we are also paving the road for a better world for all.

Also, keep in mind that green technology is not a one-size-fits-all answer. When it comes to sustainability, different locations and communities may have distinct demands and resources. Prioritizing localized solutions and involving local populations in decision-making are critical. By considering cultural, social, and economic factors, we can ensure that green technology is implemented in a way that benefits everyone and leaves no one behind.

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