Economic Sciences
https://economic-sciences.com
ES (2024) 20(2), 215-226 | ISSN:1505-4683

Climate Finance: Pioneering Pathways to Sustainability

Mohd Irfan Pathan[1], Dr. Salil Seth[2], Lokesh Tomar[3], Parveen Yadav[4], Mrinal Kanti Mahato[5]

[1]Research Scholar (UGC-NET-JRF), Department of Management Studies, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow, Uttar Pradesh, India. E-mail: khanirrfan777@gmail.com
ORCID ID: https://orcid.org/0009-0000-9011-1211

[2]Assistant Professor, Department of Management Studies, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow, Uttar Pradesh, India. E-mail: salil100seth@gmail.com
ORCID ID: https://orcid.org/0000-0002-8842-2552

[3]Research Scholar, Department of Management Studies, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow, Uttar Pradesh, India. E-mail: lokeshtomargood123@gmail.com ORCID ID: https://orcid.org/0009-0002-8271-261X

[4]Research Scholar, Department of Marketing and Supply Chain Management, School of Business Studies, Central University of Jammu, Jammu & Kashmir, India. E-mail: raoparveen7698@gmail.com
ORCID ID: https://orcid.org/0000-0002-3631-0671

[5]Assistant Professor, Department of Business Administration, School of Business and Commerce, Manipal University Jaipur (MUJ), Rajasthan, India. E-mail: mrinalkantimahato333@gmail.com
ORCID ID: https://orcid.org/0000-0002-3385-4788

Abstract

Climate finance is a progressive financial tool to foster sustainability and address climate change mitigation and adaptation challenges. This study delineates the notion of climate finance and sustainability, illustrating their confluence and its impact on social welfare, ecological quality, and economic well-being. Climate financing involves distributing resources to environmentally sustainable enterprises and projects designed to harmonize economic growth with sustainability. Furthermore, developed nations have committed to offering financial assistance to developing nations to confront the problems presented by climate change. This paper aims to decode the confluence of climate finance and sustainability. Moreover, it underscores the significance of climate financing in tackling environmental issues, reaching carbon neutrality, and eventually realizing sustainable development. The finding indicates that climate finance is essential for addressing climate change and achieving sustainability, highlighting the significant role of developed nations and the private sector in closing the funding gap required for investments in climate-resilient projects and infrastructure. Consequently, this can generate possibilities for people and nations to earn carbon credits, which are tradable in carbon markets, thereby securing financial benefits.

Keywords: *Climate Finance, Sustainability, Climate Change, Sustainable Development and Green Finance.*

1.0 Introduction

Climate change has become a critical worldwide concern of the 21st century, requiring urgent and coordinated efforts by governments, industry, and society. The effects of global warming are becoming more evident with rising sea levels, a surge in severe meteorological phenomena, and rapid ecological deterioration. These developments underscore the urgent need for significant financial investments and resource allocation to alleviate and adjust to climate change. Climate finance, first established by the UNFCCC in 1992, serves a vital function in directing funds toward efforts to address climate change and promote adaptation measures. This is particularly critical for developing nations, which often face heightened environmental risks and have limited resources to pursue low-carbon development pathways.

Sustainability has emerged as a fundamental requirement and core principle of the global economy, receiving significant recognition from

governments, international organizations, laws, and industries. According to the United Nations, sustainability entails meeting the current demands of the current generation while guaranteeing that future generations may fulfill their requirements without compromise. This concept is closely tied to environmental preservation, social equity, and economic stability. Achieving sustainability globally necessitates not only regulatory frameworks but also substantial financial backing to facilitate the shift towards an economy that is both resilient to climate impacts and operates with reduced carbon emissions.

This study aims to build a nexus between climate finance and sustainability, with a focus on the critical role of climate finance and the innovative approaches it employs to propel climate action forward. By examining the expanding role of climate finance, this research seeks to add to the discussion on leveraging financial systems to tackle climate change and encourage long-term sustainability.

2.0 Literature Review

2.1 Climate Finance: Embracing eco-centric finance

Climate change poses an immediate challenge for the entire planet. Its impacts, such as natural disasters and severe weather events, affect ecosystems, economies, and societies (Zhao et al., 2022; Batten et al., 2016). The planet is presently confronting a climatic crisis. Using fossil fuels has markedly augmented greenhouse gas emissions, modifying the atmospheric gas composition. Consequently, since pre-industrial times, global temperatures have increased by approximately 1.1°C times (UNEP, 2023). Thus, nations must reconsider current commercial and economic structures, advancing robustly toward renewable energy to align with the shift toward a sustainable economy. This transition emphasizes the integration of carbon management and decarbonization within sustainable business practices, encompassing green distribution strategies, precise emissions tracking, and reliance on alternative fuels (Seth, S. et al., 2023). Additionally, contemporary businesses are taking steps to produce eco-friendly products and adopt sustainable practices to better align with the growing green market segment (Yadav, P et al., 2023).

Climate finance refers to financial assistance provided at local, national, or international scales, sourced from public, private, or other funding channels, to support efforts in mitigating and adjusting to the consequences of climate change (UNFCCC). Although the UNFCCC has thoroughly classified climate finance into public and private sectors, there is no consensus within the academic community regarding its definition. The distinctions between climate finance, green finance, and sustainable finance have become increasingly blurred, causing significant confusion (Zhang et al., 2019; Shishlov & Censkowsky, 2022; Debrah et al., 2023).

As per the research conducted by Zhang et al., 2019 green finance is often described as financial investments that deliver environmental advantages, which distinguishes it from the concept of climate finance. However, both share the key characteristic of being funding mechanisms aimed at tackling environmental challenges. Accordingly, the study of Debrah et al., 2023 postulates that climate finance involves various strategies to mitigate and adapt to climate change, whereas sustainable finance focuses on providing capital for green initiatives that promote social inclusion. Green finance covers a broad spectrum of areas, including sustainable finance, carbon finance, and climate financing. It is a financial service dedicated to improving environmental quality, addressing climate change, and promoting efficient resource use. In the opinion of (Shishlov and Censkowsky, 2022) climate finance falls under the broader category of green finance, which, in turn, is part of the wider framework of sustainable finance. They emphasize that sustainable finance aims to support a more extensive array of sustainable development goals by targeting both environmental and social challenges.

The Global South, particularly low-income countries, bears the brunt of the impacts of climate change, largely due to limited abilities to mitigate and adapt to these effects. Consequently, they rely significantly on climate funding. Achieving the objective of restricting global warming to below 1.5

Economic Sciences
https://economic-sciences.com
ES (2024) 20(2), 215-226 | ISSN:1505-4683

˚C is feasible alone via expedited mitigation efforts. Substantial investments in green technologies are essential to keep global warming within the target limit, which demands rapid and widespread emission reductions and a comprehensive shift away from high-carbon production and consumption across all sectors (Kriegler et al., 2018).

The Paris Agreement highlights the critical need for developing nations to utilize climate finance to alleviate carbon emissions by infusing resources with green technologies and addressing the challenges posed by severe weather events like floods and droughts (Banga, 2019). In the Cancun Agreements 2010, wealthier nations pledged to collectively raise USD 100 billion annually by 2020 to support the needs of less-developed countries (Khan et al., 2020). The Green Climate Fund (GCF) was created under the Cancun Agreement and designated as an operational entity within the financial system. This commitment was reaffirmed by wealthy nations in the Paris Agreement (2015), where they agreed to provide USD 100 billion each year before 2025. Nonetheless, developed nations are not honoring their commitments to assisting developing countries in addressing climate catastrophe.

The study revealed that economic expansion, traditionally linked to high-carbon growth, has challenges due to climate change. The swift implementation of a novel, low-carbon development model is essential for the global economy. By 2030, developing countries possess the highest capacity to mitigate global greenhouse gas emissions. Emerging nations must invest hundreds of billions of dollars in transportation, energy, and other sectors to fully comply with their emission reduction potential (Ackerman, 2019). Climate finance represents a transformative shift in financial practices, involving key aspects such as strategy, governance, and risk management (Weber, 2005; Triodos Bank, 2019). It also opens up new business opportunities, drawing on a variety of instruments from a mix of international and domestic, public and private sources (Fankhauser & Stern, 2016). Moreover, it is shaped by stakeholder demands, and influenced by regulations and other norms (Pyka & Noco, 2021; Khan et al., 2021).

According to Barua (2020) achieving the United Nations SDGs by 2030 will require trillions of dollars in annual investments to support climate action. Similarly, the research conducted by Adhikari et al., 2021 projects that from 2030 to 2050, approximately $300 to $500 billion will need to be invested each year to develop climate-resilient infrastructure. As a result, climate finance is critical in mitigating the effects of climate change and supporting the IPCC's 2018 target of keeping global warming below 2°C above before industrial times (Tollefson, 2018). In summary, the increasing incorporation of climate finance into global economic strategies underscores its crucial importance in combating climate change; however, its efficacy will ultimately rely on persistent political commitment, innovative financial frameworks, and equitable resource access for vulnerable regions.

2.2 Spectrum of Sustainability

Tackling climate change presents a significant opportunity to enhance environmental conditions while simultaneously advancing low-carbon development strategies (IPCC, 2021). This is particularly important for developing nations, which frequently face challenges due to limited financial resources and technological capabilities to combat climate change and the deterioration of environmental conditions (Carfora & Scandurra, 2019). Numerous conventional techniques for enhancing environmental sustainability have been recognized in the literature. The carbon trading market, involving the exchange of greenhouse gas emission allowances along with associated financial activities and transactions, is frequently viewed as an effective approach to enhancing environmental quality in developing countries (Perdan & Azapagic, 2011). Nevertheless, several research has indicated that carbon trading fails to meet its objectives and encounters various operational issues (Michaelowa et al., 2019).

Environmental sustainability has emerged as a significant concern for the business sector, with several developing and industrialized nations facing criticism for their contributions to environmental deterioration, which results in economic, environmental, and social issues (Amankwah-Amoah, 2020). As per Brown et al., 1987

sustainability is increasingly recognized as a key goal in the realms of development and environmental management. The concept of "sustainability" differs in interpretation across various fields and contexts, including social, economic, and ecological aspects. In recent years, numerous definitions of sustainability and sustainable development have emerged. These words are regarded as intricate, contentious, and often mutually incompatible (Baker, 2006; Lozano, 2008; Hussey et al., 2001). The concept of sustainability has progressed to encompass multiple dimensions, compelling organizations to alter their operational and reporting practices to prioritize factors beyond mere economic performance (Choi and Ng, 2011; Delai and Takahashi, 2011). The environmental, economic, and social aspects, commonly known as the triple bottom line, have traditionally been seen as essential elements of sustainability and sustainable development (Choi and Ng, 2011; Vos, 2007). These dimensions are crucial factors for analysts and policymakers involved in regional development (Galdeano-Gómez et al., 2013).

Research and development (R&D), coupled with the spread of green knowledge, plays a vital role in driving innovation within companies (Qu & Liu, 2022). Corporations can utilize these technologies to build innovative commodities and approaches, as well as to improve existing ones, which ultimately strengthens their economic, environmental, and social outcomes (Khan et al., 2022). Knowledge creation encompasses actions, interactions, and conversations with others (Chamba-Rueda et al., 2021). To attain longer sustainability, organizations must allocate substantial resources to environmental projects, which in turn promote the generation of new environmental knowledge and the advancement of green technologies (Konno & Schillaci, 2021; Khan et al., 2022). As per Zwain et al., 2021 discovered the majority of employees acquire knowledge from their coworkers and peers. Employees can formulate fresh approaches to environmental issues by engaging in environmental advocacy initiatives at their workplaces (Attia & Salama, 2018).

Corporate Sustainable Development (CSD) consists of three key pillars: environmental, economic, and social (Xie et al., 2022). The ecological aspect focuses on maintaining clean air and water, ecosystems, conserving natural resource use—especially non-renewables—developing sustainable goods and lowering hazardous gas and liquid emissions (Song et al., 2022). As stated by Abbas and Dogan (2022), the social dimension aims to strengthen the bond between organizations and society, thereby enhancing human well-being by addressing individual needs. This dimension highlights the importance of cultural enrichment, social equity, development, and support, as well as individual entitlement and justice. The economic dimension has a pragmatic perspective, focusing on raising revenue and lowering operating expenditures to optimize a company's profitability (Sianturi et al., 2022).

Environmental performance (EP) may be seen as a method for an organization to address environmental concerns within its operations, as mandated by the standards (Montabon et al., 2007). Stakeholders, society, and the government are increasingly perceiving commercial enterprises as accountable for resolving environmental concerns (Chaudhary et al., 2023; Unsworth et al., 2016). This compels organizations to integrate environmental concerns as a primary strategy objective and regard it as a vital factor in overall success (Majid et al., 2020; Joyce and Paquin, 2016). Green Business Strategy (GBS) immediately contributes to improved environmental performance concerning utility usage, waste management, and environmental risk mitigation. This alignment enhances the business's cost competitiveness and provides a competitive advantage by differentiating it (Singjai et al., 2018). These approaches substantially enhance companies' environmental and economic performance (Ahmed et al., 2018).

Research indicates a favorable correlation between environmentally sustainable tactics and enhanced financial outcomes, as well as overall corporate success (Baker and Sinkula, 2005; Ioannidis et al., 2021; Clarkson et al., 2011). The articulated environmental strategy might facilitate firms in fulfilling their sustainability commitments and

Economic Sciences
https://economic-sciences.com
ES (2024) 20(2), 215-226 | ISSN:1505-4683

enhancing their environmental performance. An environmentally friendly image may lead to enhanced demand and less price sensitivity (Brammer and Millington, 2008). In conclusion, attaining sustainability necessitates a comprehensive strategy that harmonizes environmental stewardship, economic viability, and social equality, guaranteeing that future generations inherit a world where human prosperity and ecological well-being live together.

2.3 Intersecting Climate Finance with Sustainability

In the context of a rapidly evolving global environment, highlighting the significance of sustainable development and the urgent need to confront climate change is critical (Radu et al., 2013). With ongoing advancements in industrialization and business growth, the resulting negative impacts on the environment, evident through increased carbon footprints, cannot be overlooked (Mahato, M.K. et al., 2023). The climate finance aspect of green finance is pivotal in achieving carbon neutrality and promoting sustainable economic growth by focusing on investments and practices that yield environmental benefits (Bhatnagar et al., 2022). Furthermore, the progression of green finance is essential for attaining sustainable development goals and tackling urgent environmental challenges (Goel et al., 2022). Numerous empirical research indicates that climate financing enhances the quality of the environment by mitigating greenhouse gas emissions (Gu & He, 2012, Jalil & Feridun, 2011).

It is broadly recognized that the financial industry is prominent in hastening the shift towards sustainability and carbon neutrality. One explanation is that the climate goals set out by the UN SDGs and the Paris Agreement would require substantial investments, necessitating substantial sums of private finance (UNEP 2015; Bielenberg et al. 2016; Gielen, 2017). The financial sector contributes to the enhancement of environmental quality. The financial sector can provide support to environmentally sustainable businesses and projects while also driving improvements in industrial structures that are essential in diminishing energy usage and carbon emissions (Chang, 2015; Nasreen et al., 2017; Ziaei, 2015). The study conducted by Poberezhna (2018) investigated how the green economy and blockchain technology can address global water scarcity, thereby reducing the risk of environmental degradation. Additionally, Gianfrate and Peri (2019), emphasized the critical role of green bonds in mobilizing financial resources to achieve the carbon reduction targets outlined in the Paris Agreement.

Differences in geographic location and economic strength lead to significant variations in vulnerability to ecological deterioration between industrialized and emerging nations (Angelsen & Dokken, 2018). The relationship between financial accretion and environmental decay in developing countries has been a pivotal concern in global dialogues. (Teixidó-Figueras et al., 2016). Established economies generate the majority of global greenhouse gas (GHG) emissions, whereas emerging nations have very modest per capita carbon dioxide emissions (Okereke & Coventry, 2016). Conversely, several low-income nations are now experiencing the adverse impacts of climate change, particularly Small Island Developing States (SIDS), which are susceptible to increasing sea levels (Robinson & Dornan, 2017).

Countries around are currently executing and cooperating on methods to mitigate carbon dioxide emissions in the quest for environmental sustainability. Various approaches can be employed to achieve this goal. The worldwide carbon trading market primarily functions within the guidelines set by the Kyoto Protocol, incorporating mechanisms like;

- International Emissions Trading (IET)
- Joint Implementation (JI)
- Clean Development Mechanism (CDM) (Michaelowa et al., 2019).

International Low-Carbon Technologies (LCT) includes various technologies designed to lower CO_2 via harnessing renewable energies. These technologies focus on enhancing energy efficiency and promoting cleaner energy options (Rai & Funkhouser, 2015). Additionally, the Paris Agreement, utilizes Nationally Determined Contributions (NDCs) as its revised compliance

Economic Sciences
https://economic-sciences.com
ES (2024) 20(2), 215-226 | ISSN:1505-4683

framework, requiring nations to submit their NDCs to effectively lower global greenhouse gas (GHG) emissions.

Although conventional approaches to improving environmental quality in the face of climate change have received much attention, one new field—climate finance—has received less attention from academics. Industrialized nations have provided financial help to developing nations' mitigation and adaptation efforts since the 1997 Kyoto Protocol and reaffirmed as a top priority in the ongoing international climate discussions, climate financing is a key tool for assisting in battling global warming in underdeveloped nations (Carfora & Scandurra, 2019).

In this research, climate finance is stated as the allocation of funds towards initiatives that foster development that is both low in carbon emissions and resilient to climate change. These drives strive to tackle GHG discharge or improve adaptation efforts, thus contributing to the achievement of net-zero carbon targets as established in the Paris Agreement and encouraging sustainable environmental practices (Castro & Betzold, 2016). Climate finance can be bifurcated into two primary types based on their objectives: adaptation finance, which focuses on managing the current or anticipated effects of climate change, and mitigation finance, which targets the limiting of greenhouse gas release through outlay in clean energy sources and efforts to combat deforestation (Pickering et al., 2017).

Finance can significantly contribute to promoting sustainability through various mechanisms. These mechanisms include fiscal and monetary policies, investor awareness regarding unsustainable business practices that could result in stranded assets (Material Economics & SEI, 2018; McGlade & Ekins, 2015), concerns about climate policy and the risks tied to climate impacts (Bloomberg et al., 2017), enhanced transparency regarding the financing of unsustainable economic activities (Galaz et al., 2018; Global Canopy Programme, 2016; Gardner et al., 2019; Folke et al., 2019), and a greater understanding of how ESG factors affect the financial performance of investments (Busch et al., 2016).

Recognizing the challenges faced by developing countries in tackling environmental sustainability, climate finance was established as a vital tool for lowering global emissions. It aims to support these nations in achieving economic growth alongside a reduction in greenhouse gas emissions. Additionally, climate finance aims to create incentives for promoting low-carbon growth (Lee et al., 2022). Climate financing plays a critical role in enabling significant investments that target the reduction of carbon emissions and address the adverse effects of climate change. This support is crucial for driving the transition toward low-carbon, sustainable growth and achieving climate-related and sustainable development goals (CPI, 2019; UNFCCC, 2015).

3.0 Research Methodology

This research utilized a qualitative approach to examine the connection between climate financing and sustainability. The research used a grounded theory approach to develop concepts inductively. This study was exploratory, and aimed at elucidating the critical role of climate financing in achieving sustainable practices within the business through an analysis of the current literature. The utilization of the inductive technique facilitates a thorough comprehension of the subject from a theoretical standpoint. This research employs secondary data to establish a theoretical framework, involving a comprehensive literature assessment of academic journals, government papers, and industry reports pertinent to climate financing and sustainability. The primary focus was on the terminology and ideas of climate finance, as well as the contributions of this financing to economic, social, and environmental sustainability. Databases like Web of Science, Google Scholar, and Scopus were utilized to identify and compile relevant research publications. Terms such as “climate finance,” “green finance,” “sustainability,” “climate change,” and “sustainable development” were employed as instruments for data extraction from the databases. The notions of commonality and homogeneity were employed to derive the conclusions of the paper. Like other studies, it has drawbacks, including its qualitative nature, absence of hypothesis testing, and neglect of the association between other pertinent aspects such

Economic Sciences
https://economic-sciences.com
ES (2024) 20(2), 215-226 | ISSN:1505-4683

as green innovation and corporate social responsibility with sustainability. Consequently, subsequent researchers have to integrate these elements into their investigations.

4.0 Findings

The examination of the literature indicated the likely outcomes based on the link between the variables;

- The study suggested the pivotal role of climate finance in addressing mitigation and adaptation of climate change, however, obtaining a comprehensive result and fulfilling the objective of the Paris Agreement triggers the need for excessive finance from local, national, and transnational sources.
- The evidence suggested that developing and lower-income nations are the most susceptible to the detrimental effects of climate change. They have insufficient resources to tackle ecological change and financial constraints to invest in eco-innovation. Hence, climate finance directed from developed nations as agreed in the Cancun and Paris Agreement is vital to balancing the environment.
- To pursue the concept of sustainability; countries, industries, and corporations have to embrace and reinforce the model of the triple bottom line in their conduct, operation, and decision-making to gain legitimacy and long-term success.
- The literature analysis indicated a positive association between environment-sustainable tactics and improved monetary outcomes leading to overall business success. Precise ecological strategies have the potential to meet the sustainable commitment and increase environmental performance. Accordingly, an environment-conscious image of the company may provide the privilege to charge a premium price and remain in demand.
- Various empirical research showed, that climate finance promotes sustainability and enhances ecological quality and environmental performance. It also documented the significant impact of green money on carbon emissions, fostering innovation & adoption of green technology and products.
- It was broadly acknowledged by researchers and studies that finance is integral to mitigating ecological challenges, attaining carbon neutrality, and hastening the shift toward green technology & sustainability. It can work in two ways, on one hand, it can provide financial assistance and loans to eco-centric enterprises and projects, and in other instances, it facilitates the eco-friendly structuring of the industries enabling a substantial reduction in emission, raw material usage, energy consumption, and waste secretion.
- As per the literature, countries at the global level were partnering, sharing, and implementing several measures to reduce emissions and pollution significantly to achieve sustainability. As a result, various approaches have been used such as the carbon trading market mainly depends on IET, JI, and CDM frameworks established by the Kyoto Protocol. Accordingly, Lower Carbon Technologies have been utilized to promote sustainability and improve environmental quality.

5.0 Conclusion

This study sought to examine the principles of climate financing and sustainability, establishing that sufficient climate money is crucial for actualizing sustainability. Climate finance and green capital significantly influence the reduction of carbon emissions, the achievement of carbon neutrality, and the acceleration of the transition to advanced eco-friendly technologies. The integration of eco-centric strategies into the company's culture and operations enhances brand image, strengthens customer loyalty, and secures societal legitimacy. The research indicated that infusing climate finance and green funds facilitates sustainability by improving ecological performance, addressing social needs, and generating wealth to meet economic requirements.

The intensification of climate change and its devastating consequences compelled nations to reevaluate the existing economic framework; thus, it is imperative to pursue net-zero emissions and sustainability through the financing of environmentally sustainable enterprises and projects, the construction of climate-resilient

infrastructure, international collaboration, and the sharing of knowledge and resources. It would be difficult, particularly for impoverished and emerging nations, to reconcile economic development with sustainability without receiving significant and continuous assistance from rich countries, as pledged in the Cancun and Paris Agreements. Additional study is crucial to assess and reveal the long-term relationship and effects of climate financing on sustainability. Future studies may analyze other variables, including green innovation, carbon finance, and the influence of policy frameworks on promoting climate finance and sustainability.

The shift toward a sustainable future depends on various factors, such as government policies and backing, environmental commitment, partnerships and knowledge sharing, the implementation of eco-conscious practices, and fostering a culture of sustainability. Achieving the goals set by the UNFCCC requires significant financial resources for sustainable development. Given the insufficiency of public funding alone, private sector investments play a crucial role in bridging this gap.

References

1. Abbas, J., & Dogan, E. (2022). The impacts of organizational green culture and corporate social responsibility on employees' responsible behaviour towards the society. *Environmental Science and Pollution Research*, *29*(40), 60024-60034.
2. Ackerman, F. (2009). *Financing the climate mitigation and adaptation measures in developing countries* (Vol. 57). UN.
3. Adhikari, B., & Safaee Chalkasra, L. S. (2023). Mobilizing private sector investment for climate action: enhancing ambition and scaling up implementation. *Journal of Sustainable Finance & Investment*, *13*(2), 1110-1127.
4. Ahmed, W., Ahmed, W., & Najmi, A. (2018). Developing and analyzing framework for understanding the effects of GSCM on green and economic performance: perspective of a developing country. *Management of Environmental Quality: An International Journal*, *29*(4), 740-758.
5. Amankwah-Amoah, J. (2020). Stepping up and stepping out of COVID-19: New challenges for environmental sustainability policies in the global airline industry. *Journal of Cleaner Production*, *271*, 123000.
6. Angelsen, A., & Dokken, T. (2018). Climate exposure, vulnerability, and environmental reliance: A cross-section analysis of structural and stochastic poverty. Environment and Development Economics, 23(3), 257-278.
7. Attia, A., & Salama, I. (2018). Knowledge management capability and supply chain management practices in the Saudi food industry. *Business Process Management Journal*, *24*(2), 459-477.
8. Baker, S., 2006. Sustainable Development (1st ed.). Routledge, London, UK.
9. Baker, W. E., & Sinkula, J. M. (2005). Environmental marketing strategy and firm performance: Effects on new product performance and market share. *Journal of the academy of marketing science*, *33*(4), 461-475.
10. Banga, J. (2019). The green bond market: a potential source of climate finance for developing countries. *Journal of Sustainable Finance & Investment*, *9*(1), 17-32.
11. Barua, S. (2020). Financing sustainable development goals: A review of challenges and mitigation strategies. *Business Strategy & Development*, *3*(3), 277-293.
12. Batten, S., Sowerbutts, R., & Tanaka, M. (2016). Let's talk about the weather: the impact of climate change on central banks.
13. Bhatnagar, M., Taneja, S., & Özen, E. (2022). A wave of green start-ups in India— The study of green finance as a support system for sustainable entrepreneurship. Green Finance, 4(2), 253-273.
14. Bielenberg, A., Kerlin, M., Oppenheim, J., & Roberts, M. (2016). Financing change: How to mobilize private-sector financing for sustainable infrastructure. McKinsey Center for Business and Environment, 24-25.
15. Bloomberg, M. R., Pavarina, D., Pitkethly, G., Thimann, C., & Sim, Y. L. (2017). Final report: Recommendations of the task force on climate-related financial disclosures. Task Force on

Climate-Related Financial Disclosures (TCFD), Switzerland.
16. Brammer, S., & Millington, A. (2008). Does it pay to be different? An analysis of the relationship between corporate social and financial performance. *Strategic management journal*, *29*(12), 1325-1343.
17. Brown, B. J., Hanson, M. E., Liverman, D. M., & Merideth, R. W. (1987). Global sustainability: Toward definition. *Environmental management*, *11*, 713-719.
18. Busch, T., Bauer, R., & Orlitzky, M. (2016). Sustainable development and financial markets: Old paths and new avenues. Business & Society, 55(3), 303-329.
19. Carfora, A., & Scandurra, G. (2019). The impact of climate funds on economic growth and their role in substituting fossil energy sources. Energy Policy, 129, 182-192.
20. Castro, P., & Betzold, C. (2016). Climate Finance after the Paris Agreement.
21. Chamba-Rueda, L. M., Dávila, G. A., & Pardo-Cueva, M. (2023). Quality management, knowledge creation, and innovation performance: Insights from Ecuador. *Latin American Business Review*, *24*(1), 31-58.
22. Chang, S. C. (2015). Effects of financial developments and income on energy consumption. *International Review of Economics & Finance*, *35*, 28-44.
23. Chaudhary, S., Kaur, P., Alofaysan, H., Halberstadt, J., & Dhir, A. (2023). Connecting the dots? Entrepreneurial ecosystems and sustainable entrepreneurship as pathways to sustainability. *Business Strategy and the Environment*, *32*(8), 5935-5951.
24. Choi, S., & Ng, A. (2011). Environmental and economic dimensions of sustainability and price effects on consumer responses. *Journal of business ethics*, *104*, 269-282.
25. Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2011). Does it really pay to be green? Determinants and consequences of proactive environmental strategies. *Journal of accounting and public policy*, *30*(2), 122-144.
26. Debrah, C., Darko, A., & Chan, A. P. C. (2023). A bibliometric-qualitative literature review of green finance gap and future research directions. *Climate and Development*, *15*(5), 432-455.
27. Delai, I., & Takahashi, S. (2011). Sustainability measurement system: a reference model proposal. *Social Responsibility Journal*, *7*(3), 438-471.
28. Fankhauser, S., & Stern, N. (2016). Climate change, development, poverty and economics. *The state of economics, the state of the world*.
29. Financial Institutions with the Power to Save Forests. Oxford, UK: Global Canopy Programme.https://www.globalcanopy.org/sites/default/files/documents/resources/sleeping_giants_of_deforestation_-_2016_forest_500_results.pdf.
30. Folke, C., Österblom, H., Jouffray, J. B., Lambin, E. F., Adger, W. N., Scheffer, M., ... & de Zeeuw, A. (2019). Transnational corporations and the challenge of biosphere stewardship. Nature ecology & evolution, 3(10), 1396-1403.
31. Galaz, V., Crona, B., Dauriach, A., Scholtens, B., & Steffen, W. (2018). Finance and the Earth system–Exploring the links between financial actors and non-linear changes in the climate system. Global Environmental Change, 53, 296-302.
32. Galdeano-Gómez, E., Aznar-Sánchez, J. A., & Pérez-Mesa, J. C. (2013). Sustainability dimensions related to agricultural-based development: The experience of 50 years of intensive farming in Almería (Spain). *International Journal of Agricultural Sustainability*, *11*(2), 125-143.
33. Gardner, T. A., Benzie, M., Börner, J., Dawkins, E., Fick, S., Garrett, R., ... & Wolvekamp, P. (2019). Transparency and sustainability in global commodity supply chains. World Development, 121, 163-177.
34. Gianfrate, G., & Peri, M. (2019). The green advantage: Exploring the convenience of issuing green bonds. *Journal of cleaner production*, *219*, 127-135.
35. Gielen, D. (2017). Perspectives for the energy transition investment needs for a low-carbon

energy system. International Renewable Energy Agency.
36. Global Canopy Programme. 2016. Sleeping Giants of Deforestation: The Companies, Countries and
37. Goel, R., Gautam, D., Natalucci, F., & Natalucci, M. F. M. (2022). Sustainable finance in emerging markets: evolution, challenges, and policy priorities. International Monetary Fund.
38. Gu, H.-M., He, B., 2012. Study on Chinese financial development and carbon emission: evidence from China's provincial data from 1979 to 2008. Chin. J. Popul. Resour. Environ. 22 (8), 22–27. https://doi.org/10.3969/j.issn.1002-2104.2012.08.004.
39. Hussey, D. M., Kirsop, P. L., & Meissen, R. E. (2001). Global reporting initiative guidelines: an evaluation of sustainable development metrics for industry. *Environmental Quality Management*, *11*(1), 1-20.
40. Ioannidis, A., Chalvatzis, K. J., Leonidou, L. C., & Feng, Z. (2021). Applying the reduce, reuse, and recycle principle in the hospitality sector: Its antecedents and performance implications. *Business Strategy and the Environment*, *30*(7), 3394-3410.
41. IPCC, 2021. AR6 Climate Change 2021: The Physical Science Basis. Intergovernmental Panel on Climate Change. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf (Accessed on 9 April 2022).
42. Jalil, A., & Feridun, M. (2011). The impact of growth, energy and financial development on the environment in China: a cointegration analysis. *Energy economics*, *33*(2), 284-291.
43. Joyce, A., & Paquin, R. L. (2016). The triple layered business model canvas: A tool to design more sustainable business models. *Journal of cleaner production*, *135*, 1474-1486.
44. Khan, H., Abbas, J., Kumari, K., & Najam, H. (2022). Corporate level politics from managers and employees' perspective and its impact on employees' job stress and job performance. *Journal of Economic and Administrative Sciences*, (ahead-of-print).
45. Khan, M. K., Babar, S. F., Oryani, B., Dagar, V., Rehman, A., Zakari, A., & Khan, M. O. (2022). Role of financial development, environmental-related technologies, research and development, energy intensity, natural resource depletion, and temperature in sustainable environment in Canada. *Environmental Science and Pollution Research*, *29*, 622-638.
46. Khan, M., Robinson, S. A., Weikmans, R., Ciplet, D., & Roberts, J. T. (2020). Twenty-five years of adaptation finance through a climate justice lens. *Climatic Change*, *161*(2), 251-269.
47. Khan, S. J., Kaur, P., Jabeen, F., & Dhir, A. (2021). Green process innovation: Where we are and where we are going. *Business Strategy and the Environment*, *30*(7), 3273-3296.
48. Konno, N., & Schillaci, C. E. (2021). Intellectual capital in Society 5.0 by the lens of the knowledge creation theory. *Journal of Intellectual Capital*, *22*(3), 478-505.
49. Kriegler, E., Bertram, C., Kuramochi, T., Jakob, M., Pehl, M., Stevanović, M., ... & Edenhofer, O. (2018). Short term policies to keep the door open for Paris climate goals. *Environmental Research Letters*, *13*(7), 074022.
50. Lee, C. C., Li, X., Yu, C. H., & Zhao, J. (2022). The contribution of climate finance toward environmental sustainability: New global evidence. Energy Economics, 111, 106072
51. Lozano, R. (2008). Envisioning sustainability three-dimensionally. *Journal of cleaner production*, *16*(17), 1838-1846.
52. Mahato, M. K., Seth, S., & Yadav, P. (2023). Numerical simulation and design of improved optimized green advertising framework for sustainability through eco-centric computation. International Journal of Intelligent Systems and Applications in Engineering, 11(2), 11-17
53. Majid, A., Yasir, M., Yasir, M., & Javed, A. (2020). Nexus of institutional pressures, environmentally friendly business strategies, and environmental performance. *Corporate Social Responsibility and Environmental Management*, *27*(2), 706-716.
54. Material Economics, and SEI. 2018. Framing Stranded Asset Risks in an Age of Disruption. Stockholm Sweden: Material Economics & The Stockholm Environment

Institute.https://www.sei.org/wp-content/uploads/2018/03/stranded-assets-age-disruption.pdf.
55. McGlade, C., & Ekins, P. (2015). The geographical distribution of fossil fuels unused when limiting global warming to 2 C. Nature, 517(7533), 187-190.
56. Michaelowa, A., Shishlov, I., & Brescia, D. (2019). Evolution of international carbon markets: lessons for the Paris Agreement. *Wiley Interdisciplinary Reviews: Climate Change*, *10*(6), e613.
57. Montabon, F., Sroufe, R., & Narasimhan, R. (2007). An examination of corporate reporting, environmental management practices and firm performance. *Journal of operations management*, *25*(5), 998-1014.
58. Moser, C. O., & Satterthwaite, D. (2008). *Towards pro-poor adaptation to climate change in the urban centres of low-and middle-income countries* (Vol. 3). IIeD.
59. Nasreen, S., Anwar, S., & Ozturk, I. (2017). Financial stability, energy consumption and environmental quality: Evidence from South Asian economies. *Renewable and sustainable energy reviews*, *67*, 1105-1122.
60. Okereke, C., & Coventry, P. (2016). Climate justice and the international regime: before, during, and after Paris. Wiley Interdisciplinary Reviews: Climate Change, 7(6), 834-851.
61. Perdan, S., & Azapagic, A. (2011). Carbon trading: Current schemes and future developments. *Energy policy*, *39*(10), 6040-6054.
62. Pickering, J., Skovgaard, J., Kim, S., Roberts, J. T., Rossati, D., Stadelmann, M., & Reich, H. (2015). Acting on climate finance pledges: Inter-agency dynamics and relationships with aid in contributor states. World Development, 68, 149-162
63. Poberezhna, A. (2018). Addressing water sustainability with blockchain technology and green finance. In *Transforming climate finance and green investment with blockchains* (pp. 189-196). Academic Press.
64. Pyka, I., & Nocoń, A. (2021). Banks' capital requirements in terms of implementation of the concept of sustainable finance. *Sustainability*, *13*(6), 3499.
65. Qu, K., & Liu, Z. (2022). Green innovations, supply chain integration and green information system: A model of moderation. *Journal of Cleaner Production*, *339*, 130557.
66. Radu, A. L., Scrieciu, M. A., & Caracota, D. M. (2013). Carbon footprint analysis: Towards a projects evaluation model for promoting sustainable development. Procedia Economics and Finance, 6, 353-363.
67. Rai, V., & Funkhouser, E. (2015). Emerging insights on the dynamic drivers of international low-carbon technology transfer. Renewable and Sustainable Energy Reviews, 49, 350-364.
68. Robinson, S. A., & Dornan, M. (2017). International financing for climate change adaptation in small island developing states. Regional Environmental Change, 17, 1103-1115.
69. Seth, S., Mahato, M. K., & Yadav, P. (2023). Conjugation of Decarbonization & Carbon Management Systems for realization of Eco-centric Sustainability. Journal of Informatics Education and Research, 3(2).
70. Shishlov, I., & Censkowsky, P. (2022). Definitions and accounting of climate finance: between divergence and constructive ambiguity. *Climate Policy*, *22*(6), 798-816.
71. Sianturi, N. M., Nofirman, N., Yulianti, E. B., Fatmawati, E., & Hendriarto, P. (2022). Relevancy technological innovation and community economic development in Indonesia. *Linguistics and Culture Review*, *6*(S3), 117-130.
72. Singjai, K., Winata, L., & Kummer, T. F. (2018). Green initiatives and their competitive advantage for the hotel industry in developing countries. *International Journal of Hospitality Management*, *75*, 131-143.
73. Song, M., Peng, L., Shang, Y., & Zhao, X. (2022). Green technology progress and total factor productivity of resource-based enterprises: A perspective of technical compensation of environmental regulation. *Technological Forecasting and Social Change*, *174*, 121276.

74. Teixidó-Figueras, J., Steinberger, J. K., Krausmann, F., Haberl, H., Wiedmann, T., Peters, G. P., ... & Kastner, T. (2016). International inequality of environmental pressures: Decomposition and comparative analysis. Ecological Indicators, 62, 163-173.
75. Tollefson, J. (2018). IPCC says limiting global warming to 1.5 [degrees] C will require drastic action. *Nature*, *562*(7726), 172-174.
76. Triodos Bank. (2019). Las Finanzas sostenibles. Estado de la cuestion ´ y motivaciones para su desarrollo. Retrived from https://www.triodos.es/binaries/content/documents/tbes/shared/press-releases/es/2019/foro-academico-finanzas-sostenibles/foro - academico-finanzas-sostenibles/triodoshippo%3AresourceDownload/triodoshippo %3Afile. Last accessed 1, 2022.
77. UNEP (2023) Climate change 2023: synthesis report. UN Environment Programme.
78. UNEP. (2015). The Financial System We Need: Aligning the Financial System with Sustainable.
79. Unsworth, K. L., Russell, S. V., & Davis, M. C. (2016). Is dealing with climate change a corporation's responsibility? A social contract perspective. *Frontiers in Psychology*, *7*, 1212.
80. Vos, R. O. (2007). Defining sustainability: a conceptual orientation. *Journal of Chemical Technology & Biotechnology: International Research in Process, Environmental & Clean Technology*, *82*(4), 334-339.
81. Weber, O. (2005). Sustainability benchmarking of European banks and financial service organizations. *Corporate social responsibility and environmental management*, *12*(2), 73-87.
82. Xie, Z., Liu, X., Najam, H., Fu, Q., Abbas, J., Comite, U., ... & Miculescu, A. (2022). Achieving financial sustainability through revenue diversification: A green pathway for financial institutions in Asia. *Sustainability*, *14*(6), 3512.
83. Yadav, P., Seth, S., & Mahato, M. K. (2023). Channelizing Eco-Centric Marketing for Sustainable Product Consumption. resmilitaris, 13(2), 4162-4170.
84. Zhang, D., Zhang, Z., & Managi, S. (2019). A bibliometric analysis on green finance: Current status, development, and future directions. *Finance Research Letters*, *29*, 425-430.
85. Zhao, J., Zhou, B., & Li, X. (2022). Do good intentions bring bad results? Climate finance and economic risks. *Finance Research Letters*, *48*, 103003.
86. Ziaei, S. M. (2015). Effects of financial development indicators on energy consumption and CO2 emission of European, East Asian and Oceania countries. *Renewable and Sustainable Energy Reviews*, *42*, 752-759.
87. Zwain, A. A. A., Teong, L. K., & Othman, S. N. (2011). Total quality management and organizational knowledge acquisition: an empirial study of Iraqi HEIs. In *The 5th Annual Global Communication Association Conference, GCA 2011* (pp. 18-20).