

The Nexus Between Development and Environment

Aarti Madan¹, Ankit Suri², Dr. Vaniki Joshi Lohani³, Dr. Lokesh Jindal⁴

^{1,2} Research Scholar ³ Assistant Professor ⁴ Associate Professor

Atal Bihari Vajpayee School of Management and Entrepreneurship, Jawaharlal Nehru University, New Delhi, India

Abstract

Development and its interrelationship with the environment are complex. Environment plays a vital role in a country's development by supplying natural resources. However, human negligence toward the environment during development activities causes environmental degradation. As a result, economies have increasingly faced the dual challenge of achieving higher economic growth while limiting environmental harm. Governments and international organizations, including the United Nations, have made achieving environmental sustainability and minimizing environmental degradation a top concern. In this paper, we discuss the relationship of various aspects of development, namely infrastructural development, financial development, economic growth, human development, social development, and political development, with the environment. We also present solutions to shift from 'environment versus development' to 'environment and development.'

Introduction

Growth, advancement, positive change, or the addition of infrastructural, economic, financial, social, political, and human components to an economy are all examples of development. The environment has a critical role in a country's growth. It offers natural resources that are input into the production processes of many industries, and the industries, in turn, pay for the environment by causing pollution and carbon emissions. Significant environmental damage has come from development. The global debate on climate change and the resultant global warming is dominated by environmental degradation, which is principally reflected by growing amounts of carbon dioxide (CO₂) emissions. The Paris Agreement, a legally enforceable climate change treaty ([United Nations Climate Change 2021](#)), was signed by 196 countries in 2015 with the goal of limiting global warming to less than 2 degrees Celsius this century, ideally 1.5 degrees Celsius. The Paris Agreement of 2015 stated that the most significant problem facing governments

worldwide is their capacity to create and execute environmentally sound and economically viable policies, technologies, and innovations ([Tao et al. 2022](#)).

Environmental and natural resource mismanagement results in significant economic losses. Air pollution is the greatest serious environmental danger to human health, costing the global economy 6.1 per cent of its annual GDP ([IPBES](#)). The COVID-19 pandemic highlights the connections between people's health and the environment since zoonotic illnesses account for around 70 per cent of new infectious diseases. Pathogens thrive in areas where human activity and climate change affect natural ecosystems, such as deforestation. The environment may offer the foundation for long-term growth if properly maintained. To ensure sustainable growth, more excellent natural resource management, environmentally friendly fiscal policies, greener financial markets, and comprehensive waste management programmes are necessary.

The development benefits many aspects of life, such as lowering poverty and inequality, improving health care, raising living standards, expanding work possibilities, etc. However, economies could not prevent the inescapable environmental deterioration caused by massive resource exploitation and the production of environmentally harmful gases, which resulted in global warming. As a result, economies have increasingly faced the dual challenge of achieving higher economic growth while limiting environmental harm. Thus, merging the environment and development, the notion of sustainable development was born. Governments and international organizations, including the United Nations, have made achieving environmental sustainability and minimizing environmental degradation a top concern.

Development and environmental protection are not mutually exclusive as long as regulations manage the environmental consequences of the goods and services we produce and use. For a greener, cleaner, more resilient, more developed society, our focus should shift from 'environment versus development' to 'environment and development'. This study examines the relationship between many forms of development and the environment, including infrastructural development, financial development, economic growth, human development, social development, and political development. Further, we present suggestions to mitigate the impact of development on the environment.

Infrastructure development and environment

Infrastructure development is critical for a country's sectoral and overall economic growth ([Ismail and Mahyideen 2015](#)). Electricity, dams, roads, bridges, telecommunications, trains, irrigation, clean water and sanitation, airports, warehousing facilities, and oil and gas pipelines are the major components of the infrastructure sector, which enables the growth of a country and reduction of poverty ([Asian Development](#)

Bank 2012). According to Fan and Chan-Kang (2004), rural road investments produce significant returns in India. They anticipated a reduction in poverty of ten persons per kilometre of road expansion in low-potential rain-fed locations and economic rates of return ranging in thousands of per cent.

Infrastructure development is necessary for improving the quality of life, but it can have environmental consequences. For instance, Dams contribute to the development of a country in various ways like energy generation, irrigation, flood control, fishing, and providing drinking water (Berga et al. 2006; Otman 2013). But, dams can have negative environmental consequences leading to the continued loss of biodiversity in aquatic ecosystems, reduced or blocked sediment flow, hampered fish migration, and flooding habitats (Tahmiscioğlu et al. 2007). Road construction leads to soil erosion and sedimentation (Seutloali and Beckedahl 2015). Cement manufacturing generates 5 per cent of worldwide CO₂ emissions (Worrell et al. 2001). Coal mining destroys vegetation, causes soil erosion, and pollutes the soil, air, and water (Warhurst 1999).

However, not all infrastructural projects have adverse environmental effects. Ingeniously planned and implemented infrastructure projects can have a positive environmental impact. For example, investment in public transportation infrastructure can help in reducing carbon emissions. Investment in efficient sanitation infrastructure helps in keeping the environment clean. Roads can be designed to avoid environmentally sensitive areas and include drainage systems that prevent surface water runoff and soil erosion. Thus, integrating the environmental effects of an infrastructural project in the planning phase is critical. It allows for the consideration of environmental consequences in advance and thus helps in minimizing the adverse effects.

Financial development and environment

Financial development is defined as an increase in the depth, accessibility, and efficiency of financial markets and institutions. It is critical for managing resources, savings and investments, business activities, and economic progress (Nasreen, Anwar, and Ozturk 2017). There are two schools of thought regarding the impact of financial development on the environment. On the one hand, some studies conclude that financial development has a positive effect on the environment (Tamazian, Chousa, and Vadlamannati 2009; Jalil and Feridun 2011; Park, Meng, and Baloch 2018), while others conclude that financial development has a negative impact on the environment (Saud et al. 2020; Jiang and Ma 2019; Adams and Klobodu 2018).

Financial development provides accessible, affordable finance to households and businesses, which helps them buy energy-intensive products such as automobiles, air-conditioners, freezers, etc., leading to higher

carbon emissions. (Sadorsky 2010; Haseeb et al. 2018). Financial development stimulates foreign direct investments, which can help fund research and development of environmentally friendly technology (Frankel and Romer 1999; Tamazian and Bhaskara Rao 2010; Shah, Yasmeen, and Padda 2019). But, it can also strain energy-intensive growth, which negatively impacts the environment (Zhang 2011; Dhrifi, Jaziri, and Alnahdi 2020). Financial development can stimulate environmental protection in economies with a robust institutional framework, such as government integrity (Shah, Yasmeen, and Padda 2019; Ahmed et al. 2020).

One of the significant developments in the financial sector is green finance which aims at environmental conservation and resource sustainability. The expansion of the environmental protection sector requires a large amount of initial capital and has a long payback time; having green finance reduces the financing constraints (Wang and Zhi 2016). Green reforms implemented through financial regulations can direct more resources to ecologically sound technical developments, assisting in avoiding the detrimental impact of FD on environmental quality and reducing environmental deterioration (Khan et al. 2021). Thus, creating a green financial system might be vital in securing global prosperity while avoiding environmental decline.

The IT-enabled innovative financial solutions have radically altered the finance industry landscape. FinTech can help environmental protection by unleashing the required private investments to close the supply-demand gap in green activities. It assists countries in facilitating a transition to lower amounts of carbon and greenhouse gas emissions (Tao et al. 2022). Green fintech includes fintech solutions that support environmental protection and mitigate climate change. One of the successful examples of green fintech is Sunday Grids. It provides the opportunity to participate in shared solar panels by purchasing biscuits, which create credits for investors. These credits can be used to pay electricity bills. Thus, green FinTech has the enormous potential of such creative techniques to reduce climate change's impact (Puschmann, Hoffmann, and Khmarskyi 2020).

Human Development and the environment

Human development increases people's freedoms and choices while enhancing their well-being (Sen 1999). It takes into account education, health, and standard of living. The relation between human development and environmental quality indicates how human activities impact nature. Investment in education has been identified as one of the most effective policy measures for improving environmental quality (Bulte, Damania, and Deacon 2005; Jalan, Somanathan, and Chauduri 2009). Brasington and Hite 2005 found that when the rise of material riches came at the expense of the environment, advances in knowledge allowed individuals in the United States to exert internal constraints against excessive resource demand. Costantini and Monni

2008 examined cross-sectional data from 179 nations and discovered that investing in human capital to achieve long-term economic growth has no negative environmental consequences.

Human development is vital and valuable in environmental sustainability since human comprehension of the environment, climate change, and its repercussions are required for mitigation efforts(Ahmed and Wang 2019). According to Zen et al. (2014), individuals with higher education and wealth tend to safeguard their environment through recycling activities more than those with lower education and income. Education increases citizens' ability to support the government's drive and efforts to preserve and sustain the environment. Furthermore, when people's living standards rise, their concern for the environment also rises as they seek a cleaner and less polluted environment to improve their health (Opoku, Dogah, and Aluko 2022).

Advancement in human development is strongly tied to technological progress in increased (energy) efficiency and technical innovation, which can cut energy usage and reduce greenhouse gas emissions. An increase in Human development r has a strong and inverse relationship with energy usage (Ouedraogo 2013). As human development negatively relates to environmental degradation, policy measures should focus on investments in education, healthcare, and economic opportunities to encourage human development, contributing to environmental sustainability.

Social Development and Environmental

Social development is considered an approach to promoting human welfare (Midgley 1995). Social development includes making and maintaining friendships, working collaboratively in groups, and establishing and maintaining intimate relationships (Huitt 2011). Some societies simultaneously develop their social as well as environmental fabric. Song et al. (2022) showed that social and environmental development occurred simultaneously due to digital development. In a panel data study analyzing the causal relationship between various aspects of development, Sayel et al. (2021) showed a statistically significant relationship between Social Development Index (SDI) and Environment Development Index (ENDI) for 102 countries in the long run. Ma et al. (2021) showed that the social development index significantly promotes environmental transportation efficiency, an indicator of environmental efficiency. Sustainable development is measured by three indicators: governance, social development, and environmental development (Uyar et al. 2021). This further suggests a close connection between social and environmental factors.

The intention in environmental protection and waste management are essential factors predicted by behavioural attitude and perceived behavioural control. Studies have shown that mere awareness of

consequences significantly impacts personal moral norms towards environmental protection (Shi 2021). The concept of a 'Green Economy' arises from the idea that businesses simultaneously focus on low carbon emissions, increased use of renewable resources in energy production, promoting environmentally ethical practices, and social development that ensures human welfare and inclusiveness of diversity. As a policy, countries have mandated simultaneous use of environmentally sustainable and socially empowering guidelines for businesses. One such example is the Corporate Social Responsibility mandate in India which insists that companies above a certain threshold invest 2 per cent of the average profits of the past three years towards such causes. Projects undertaken under CSR cater to social and environmental development in many cases.

Political Development and Environment

The development of the institutions, attitudes, and values that form a society's political power system is considered political development (Smith 2001). Policies concerning environmental protection and sustainability are highly associated with political and institutional variables. Factors such as political freedom and the absence or presence of democracy can directly impact the environment (Charfeddine et al. 2017). Dasgupta et. al. (1995) argued that countries with civil liberties and freedom are instrumentally more powerful in environmental protection than countries under authoritarian rule. Empirical studies conclude that the presence of democratic values, especially in low-income countries, significantly impacts the quality of the environment, (Torras & Boyce 1998). Similarly, Farzin & Bond (2006) show that democracy provides a conducive environment where an environmental quality decision can be quickly taken compared to autocratic regimes. However, some studies even suggest an opposite picture, Harbaugh et al. (2000) showed a significantly negative relationship between the existence of harmful chemicals and the Democracy Index (a proxy for Democracy).

Therefore, the question of political development and its impact on the environment stands tall. The development in the political sphere impacts not only the willingness of the decision-making body (example: Parliament) to introduce pro-environment policies, but as studies suggest, it affects the quality of the environment itself. International cooperation between developed, under-developed, and developing economies is in the right direction that leads to global sustainability achievement. The political will to cooperate with international agencies towards the attainment of a common goal irrespective of the political structure at home can lead to innumerable gains in environmental development.

Economic Development and Environment

Economic development has an implication and a role in environmental status. Grossman & Kruger (1995) noted that as economies develop, greenhouse gas emissions first increase and subsequently decrease only after reaching a maximum level (A hump-shaped relationship AKA Environmental Kuznets Curve hypothesis). This trend is self-evident, as the initial growth stage is fuelled by carbon-based technologies and energy resources like coal, natural gases, and crude oil-based products. Only at the later growth stage nations shift toward renewable resources (Solar, Wind, Thermal, Nuclear). This relationship is empirically tested for the Indian sub-continent (India, Pakistan and Bangladesh), confirming the EKC hypothesis (Ali et al. 2022). In the theoretical explanation of the EKC hypothesis, Beckerman (1992) argues that ecological degradation relates to poverty and hence to tackle this problem, nations first need to be prosperous. High upfront costs, particularly in poor countries, continue to be a significant impediment to large-scale investments in clean technology (IPCC 2012; Schmidt 2014). Therefore, there is an urgent need to lower the costs of investing in renewable energy sources to ensure the widespread adoption of such technologies.

Therefore, how to expedite the development and transmission of clean technology is emerging as a critical topic in international climate policy matters (Pueyo et al. 2012). Mass production with the formation of incentives to shift to renewable energy technologies, Subsidized procurement of renewable energy raw materials, smooth international transfer of intellectual assets among developed and developing countries, and international public and private partnerships in the adoption of green technologies, among others can improve the status of economic development without preceding the green targets.

Suggestions and Conclusion

The research is centred on the link/relationship between various facets of development and the environment. The hot and developing study fields include sustainability and environmental protection, both of which have received much attention in the academic literature. Development is said to be either beneficial or against the environment. After conducting a literature search, we chose six areas of development: infrastructure, financial, human, economic, social, and political development. Various studies were brought to light as a result of the review, some of which favoured a certain kind of development in terms of environmental protection and sustainability, while others did not.

Infrastructure development projects are frequently chastised for causing environmental harm, yet, well-planned and executed projects may positively impact the environment. It is desirable and sustainable to shift to publicly owned, publicly utilized infrastructure rather than privately owned, privately used infrastructure.

Green technology finance, the development of financial products that incentivize green investments, and fin-tech development all help to close the supply-demand gap in green activities. The way forward is for sustainable technical breakthroughs to enhance human progress while also catering to the environment through increased energy efficiency. Empowering, encouraging, and in some cases compelling businesses to actively participate in corporate social responsibility with a long-term perspective assures social and environmental growth. Democracy and political freedom have a significant influence on the environment, according to studies on political structure and development. Regardless of the political system, we find that political will to collaborate internationally is the way ahead. On the economic front, green energy incentives and widespread use of renewable energy sources assure long-term economic prosperity. The study's result is consistent with the global narrative on sustainability; hence, a worldwide collaborative effort is necessary for this area.

References:

1. Ahmed, Zahoor, and Zhaohua Wang. 2019. "Investigating the Impact of Human Capital on the Ecological Footprint in India: An Empirical Analysis." *Environmental Science and Pollution Research* 26 (26): 26782–96. <https://doi.org/10.1007/s11356-019-05911-7>.
2. Adams, Samuel, and Edem Kwame Mensah Klobodu. 2018. "Financial Development and Environmental Degradation: Does Political Regime Matter?" *Journal of Cleaner Production* 197 (October): 1472–79. <https://doi.org/10.1016/j.jclepro.2018.06.252>.
3. Ahmed, Farhan, Shazia Kousar, Amber Pervaiz, and José Pedro Ramos-Requena. 2020. "Financial Development, Institutional Quality, and Environmental Degradation Nexus: New Evidence from Asymmetric ARDL Co-Integration Approach." *Sustainability* 12 (18): 7812. <https://doi.org/10.3390/su12187812>.
4. Ali Uzair Muhammad , Gong Zhinmin, Ali Ubaid Muhammad, Asmi Fahad and Muhammad Rizwanullah. 2022. "CO2 Emission, Economic Development, Fossil Fuel Consumption and Population Density in India, Pakistan and Bangladesh: A Panel Investigation." *International Journal of Finance & Economics* 27 (1): 18–31.
5. Asian Development Bank. 2012. "Infrastructure for Supporting Inclusive Growth and Poverty Reduction in Asia." <https://www.adb.org/sites/default/files/publication/29823/infrastructure-supporting-inclusive-growth.pdf>.

6. Beckerman, Wilfred. 1992. "Economic Growth and the Environment: Whose Growth? Whose Environment?" *World Development* 20 (4): 481–96. [https://doi.org/10.1016/0305-750x\(92\)90038-w](https://doi.org/10.1016/0305-750x(92)90038-w).
7. Berga, Luis, J. M. Buil, Eugeni Bofill, J. C. De Cea, JA Garcia Perez, Gabriel Mañueco, J. Polimon, A. Soriano, and J. Yagüe, eds 2006. *Dams and reservoirs, societies and environment in the 21st century*. Taylor & Francis.
8. Brasington, David M., and Diane Hite. 2005. "Demand for Environmental Quality: A Spatial Hedonic Analysis." *Regional Science and Urban Economics* 35 (1): 57–82. <https://doi.org/10.1016/j.regsciurbeco.2003.09.001>.
9. Brundtland, G. 1987. Report of the World Commission on Environment and Development: Our Common Future. United Nations General Assembly. <https://digitallibrary.un.org/record/139811?ln=en>
10. Bulte, Erwin H., Richard Damania, and Robert T. Deacon. 2005. "Resource Intensity, Institutions, and Development." *World Development* 33 (7): 1029–44. <https://doi.org/10.1016/j.worlddev.2005.04.004>.
11. Charfeddine, Lanouar, and Zouhair Mrabet. 2017. "The Impact of Economic Development and Social-Political Factors on Ecological Footprint: A Panel Data Analysis for 15 MENA Countries." *Renewable and Sustainable Energy Reviews* 76 (September): 138–54. <https://doi.org/10.1016/j.rser.2017.03.031>.
12. Costantini, Valeria, and Salvatore Monni. 2008. "Environment, Human Development and Economic Growth." *Ecological Economics* 64 (4): 867–80. <https://doi.org/10.1016/j.ecolecon.2007.05.011>.
13. Dasgupta, Partha, and Karl-Göran Mäler. 1995. "Chapter 39 Poverty, Institutions, and the Environmental Resource-Base." *Handbook of Development Economics*, 2371–2463. [https://doi.org/10.1016/s1573-4471\(05\)80011-7](https://doi.org/10.1016/s1573-4471(05)80011-7).
14. Dhrifi, Abdelhafidh, Raouf Jaziri, and Saleh Alnahdi. 2020. "Does Foreign Direct Investment and Environmental Degradation Matter for Poverty? Evidence from Developing Countries." *Structural Change and Economic Dynamics* 52 (March): 13–21. <https://doi.org/10.1016/j.strueco.2019.09.008>.
15. Fan, Shenggen, and Connie Chan-Kang. 2022. "Road Development, Economic Growth, and Poverty Reduction in China." <https://doi.org/0-89629-141-3>.
16. Farzin, Y. Hossein, and Craig A. Bond. 2006. "Democracy and Environmental Quality." *Journal of Development Economics* 81 (1): 213–35. <https://doi.org/10.1016/j.jdeveco.2005.04.003>.

17. Frankel, Jeffrey A, and David Romer. 1999. "Does Trade Cause Growth?" *American Economic Review* 89 (3): 379–99. <https://doi.org/10.1257/aer.89.3.379>.
18. Bond, A J, Angus Morrison-Saunders, and Richard Howitt. 2013. *Sustainability Assessment : Pluralism, Practice and Progress*. New York: Routledge.
19. Grossman, Gene M., and Alan B. Krueger 1995. "Economic growth and the environment." *The quarterly journal of economics* 110 (2): 353-377.
20. Halkos, George E., and Nickolaos G. Tzeremes. 2014. "The Effect of Electricity Consumption from Renewable Sources on Countries' Economic Growth Levels: Evidence from Advanced, Emerging and Developing Economies." *Renewable and Sustainable Energy Reviews* 39 (November): 166–73. <https://doi.org/10.1016/j.rser.2014.07.082>.
21. Harbaugh, William, Arik Levinson, and David Wilson. 2000. "Reexamining the Empirical Evidence for an Environmental Kuznets Curve," <https://doi.org/10.3386/w7711>.
22. Haseeb, Abdul, Enjun Xia, Danish, Muhammad Awais Baloch, and Kashif Abbas. 2018. "Financial Development, Globalization, and CO2 Emission in the Presence of EKC: Evidence from BRICS Countries." *Environmental Science and Pollution Research* 25 (31): 31283–96. <https://doi.org/10.1007/s11356-018-3034-7>.
23. Otman Faridah, Mohammad Heydari and Mohammad Noori. 2013. "A Review of the Environmental Impact of Large Dams in Iran." *International Journal of Advancements Civil Structural and Environmental Engineering* <https://doi.org/10.15224/978-981-07-6261-2-66>.
24. Huitt, William, and Courtney Dawson 2011. "Social development: Why it is important and how to impact it." *Educational Psychology Interactive* 20 (1): 80-100.
25. IPBES <https://ipbes.net/>
26. IPCC, 2012. Special Report of the Intergovernmental Panel on Climate Change on Renewable Energy Sources and Climate Change Mitigation. Cambridge University Press, Cambridge, UK.
27. Ismail, Normaz Wana, and Jamilah Mohd Mahyideen. 2015. "The Impact of Infrastructure on Trade and Economic Growth in Selected Economies in Asia." Asian Development Bank, no. 553 (December). <https://www.adb.org/publications/impact-infrastructure-trade-and-economic-growth-selected-economies-asia>.

28. Jalan, Jyotsna, E. Somanathan, and Saraswata Chauduri. 2009. "Awareness and the Demand for Environmental Quality: Survey Evidence on Drinking Water in Urban India." *Environment and Development Economics* 14 (6): 665–92. <https://doi.org/10.1017/s1355770x08005020>.
29. Jalil, Abdul, and Mete Feridun. 2011. "The Impact of Growth, Energy and Financial Development on the Environment in China: A Cointegration Analysis." *Energy Economics* 33 (2): 284–91. <https://doi.org/10.1016/j.eneco.2010.10.003>.
30. Jiang, Chun, and Xiaoxin Ma. 2019. "The Impact of Financial Development on Carbon Emissions: A Global Perspective." *Sustainability* 11 (19): 5241. <https://doi.org/10.3390/su11195241>.
31. Khan, Muhammad Atif, Muhammad Asif Khan, Masood Ahmed, and Karamat Khan. 2021. "Environmental Consequences of Financial Development in Emerging and Growth-Leading Economies: A Multidimensional Assessment." *Borsa Istanbul Review*, October. <https://doi.org/10.1016/j.bir.2021.10.003>.
32. Ma, Qifei, Peng Jia, and Haibo Kuang. 2021. "Green Efficiency Changes of Comprehensive Transportation in China: Technological Change or Technical Efficiency Change?" *Journal of Cleaner Production* 304 (July): 127115. <https://doi.org/10.1016/j.jclepro.2021.127115>.
33. Midgley James. *Social Development: The Developmental Perspective in Social Welfare*. 1999. Sage Publications Ltd.
34. Nasreen, Samia, Sofia Anwar, and Ilhan Ozturk. 2017. "Financial Stability, Energy Consumption and Environmental Quality: Evidence from South Asian Economies." *Renewable and Sustainable Energy Reviews* 67 (January): 1105–22. <https://doi.org/10.1016/j.rser.2016.09.021>.
35. Opoku, Eric Evans Osei, Kingsley E. Dogah, and Olufemi Adewale Aluko. 2022. "The Contribution of Human Development towards Environmental Sustainability." *Energy Economics* 106 (February): 105782. <https://doi.org/10.1016/j.eneco.2021.105782>.
36. Ouedraogo, Nadia S. 2013. "Energy Consumption and Human Development: Evidence from a Panel Cointegration and Error Correction Model." *Energy* 63 (December): 28–41. <https://doi.org/10.1016/j.energy.2013.09.067>.
37. Park, Yongmoon, Fanchen Meng, and Muhammad Awais Baloch. 2018. "The Effect of ICT, Financial Development, Growth, and Trade Openness on CO2 Emissions: An Empirical Analysis." *Environmental Science and Pollution Research* 25 (30): 30708–19. <https://doi.org/10.1007/s11356-018-3108-6>.
38. Pueyo, Ana, María Mendiluce, María Sanchez Naranjo, and Julio Lumberras. 2012. "How to increase technology transfers to developing countries: A synthesis of the evidence." *Climate Policy* 12, no. 3 (2012): 320–340. <https://doi.org/10.1080/14693062.2011.605588>

39. Puschmann, Thomas, Christian Hugo Hoffmann, and Valentyn Khmarskyi. 2020. "How Green FinTech Can Alleviate the Impact of Climate Change—the Case of Switzerland." *Sustainability* 12 (24): 10691. <https://doi.org/10.3390/su122410691>.
40. Sadorsky, Perry. 2010. "The Impact of Financial Development on Energy Consumption in Emerging Economies." *Energy Policy* 38 (5): 2528–35. <https://doi.org/10.1016/j.enpol.2009.12.048>.
41. Saud, Shah, Songsheng Chen, Abdul Haseeb, and Sumayya. 2020. "The Role of Financial Development and Globalization in the Environment: Accounting Ecological Footprint Indicators for Selected One-Belt-One-Road Initiative Countries." *Journal of Cleaner Production* 250 (March): 119518. <https://doi.org/10.1016/j.jclepro.2019.119518>.
42. Sayel Basel ;Rao, R. Prabhakara;Gopakumar, K.U. 2014. "Causal Relationship among Various Development Indices: A Panel Study." *Indian Journal of Economics and Development* 17 (3): 624–31. <https://indianjournals.com/ijor.aspx?target=ijor:ijed1&volume=17&issue=3&article=017>.
43. Schmidt, Tobias S. "Low-carbon investment risks and de-risking." *Nature Climate Change* 4, no. 4 (2014): 237-239.
44. Sen, Amartya 1999. "Poverty as capability deprivation." *Development as freedom* 6 (3): 87-110.
45. Seutloali, Khoboso Elizabeth, and Heinrich Reinhard Beckedahl. 2015. "A Review of Road-Related Soil Erosion: An Assessment of Causes, Evaluation Techniques and Available Control Measures." *Earth Sciences Research Journal* 19 (1): 73–80. <https://doi.org/10.15446/esrj.v19n1.43841>.
46. Shah, Wasi Ul Hassan, Rizwana Yasmeen, and Ihtsham Ul Haq Padda. 2019. "An Analysis between Financial Development, Institutions, and the Environment: A Global View." *Environmental Science and Pollution Research* 26 (21): 21437–49. <https://doi.org/10.1007/s11356-019-05450-1>.
47. Shi, Jian-gang, Ke Xu, Hongyun Si, Lingchuan Song, and Kaifeng Duan. "Investigating intention and behaviour towards sorting household waste in Chinese rural and urban-rural integration areas." *Journal of Cleaner Production* 298 (2021): 126827.
48. Sladovich, Hedy E., and Jesse H. Ausubel, eds. 1989. *Technology and Environment*. Vol. 25. National Academies Press.
49. Smith, Tony. "Political Development." In *The Oxford Companion to Politics of the World*. : Oxford University Press, 2001.
50. Song, Malin, Chenbin Zheng, and Jiangquan Wang.2021. "The Role of Digital Economy in China's Sustainable Development in a Post-Pandemic Environment". *Journal of Enterprise Information Management* 35 (1): 58–77. <https://doi.org/10.1108/JEIM>.
51. Svirydzenka, Katsiaryna 2016. "Introducing a new broad-based index of financial development". *International Monetary Fund*

52. Tahmiscioğlu, M. Sait, Nermin Anul, Fatih Ekmekçi, and Nurcan Durmuş. 2007. "Positive and negative impacts of dams on the environment." At International Congress on River Basin Management
53. Tamazian, Artur, and B. Bhaskara Rao. 2010. "Do Economic, Financial and Institutional Developments Matter for Environmental Degradation? Evidence from Transitional Economies." *Energy Economics* 32 (1): 137–45. <https://doi.org/10.1016/j.eneco.2009.04.004>.
54. Tamazian, Artur, Juan Piñeiro Chousa, and Krishna Chaitanya Vadlamannati. 2009. "Does Higher Economic and Financial Development Lead to Environmental Degradation: Evidence from BRIC Countries." *Energy Policy* 37 (1): 246–53. <https://doi.org/10.1016/j.enpol.2008.08.025>.
55. Tao, Ran, Chi-Wei Su, Bushra Naqvi, and Syed Kumail Abbas Rizvi. 2022. "Can Fintech Development Pave the Way for a Transition towards Low-Carbon Economy: A Global Perspective." *Technological Forecasting and Social Change* 174 (January): 121278. <https://doi.org/10.1016/j.techfore.2021.121278>.
56. Torras, Mariano, and James K. Boyce. 1998. "Income, inequality, and pollution: a reassessment of the environmental Kuznets curve." *Ecological economics* 25(2): 147-160.
57. UNEP, UNEP Copenhagen Climate Centre (UNEP-CCC) 2020. "Emissions Gap Report 2020". <https://www.unep.org/emissions-gap-report-2020>
58. United Nations Climate Change, 2021. In: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>
59. Uyar, Ali, Abdullah S Karaman, and Merve Kilic. 2019. "Institutional Drivers of Sustainability Reporting in the Global Tourism Industry." *Tourism Economics* 27 (1): 105–28. <https://doi.org/10.1177/1354816619886250>.
60. Wang, Yao, and Qiang Zhi. 2016. "The Role of Green Finance in Environmental Protection: Two Aspects of Market Mechanism and Policies." *Energy Procedia* 104 (December): 311–16. <https://doi.org/10.1016/j.egypro.2016.12.053>.
61. Warhurst, A. 1999 "Mining, mineral processing, and extractive metallurgy: an overview of the technologies and their impact on the physical environment." *Environmental policy in mining: Corporate strategy and planning for closure*
62. Worrell, Ernst, Lynn Price, Nathan Martin, Chris Hendriks, and Leticia Ozawa Meida. 2001 "Carbon dioxide emissions from the global cement industry." *Annual review of energy and the environment* 26 (1)
63. Zen, Irina Safitri, Zainura Zainon Noor, and Rafiu Olasunkanmi Yusuf. 2014. "The Profiles of Household Solid Waste Recyclers and Non-Recyclers in Kuala Lumpur, Malaysia." *Habitat International* 42 (April): 83–89. <https://doi.org/10.1016/j.habitatint.2013.10.010>.

64. Zhang, Yue-Jun. 2011. "The Impact of Financial Development on Carbon Emissions: An Empirical Analysis in China." *Energy Policy* 39 (4): 2197–2203. <https://doi.org/10.1016/j.enpol.2011.02.026>.