

Chapter 13

Impact of Digitalization on Sustainable Development in G20 Countries

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ABSTRACT

This chapter is written to explore the impact of digitalization on SDGs in G20 countries. It creates digital infrastructure index (DII) and sustainable development goal index (SDGI) as considering the digitalization and sustainable development (SD) promoting indicators during 2004 - 2022. DII and SDGI are created as employing composite Z-score method. The values of DII and SDGI are used to pronounce the comparison of G20 countries in digitalization and SD, respectively. The various forms of empirical models are adopted to assess the causal relationship between digitalization and SD. The G20 countries showed a substantial variation in digitalization and overall SDGs. Digitalization and SD showed a positive and one-way causality

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with each other. It is policy-oriented research and provides numerous proposals to increase digitalization and SD. It also highlights the scope of further research direction in the domain of digital technologies, digital transformation, and SDGs.

INTRODUCTION

The global countries cannot attain sustainable development goals (SDGs) suggested by UNDP without ensuring the sustainability in all sectors (Griggs et al., 2013). The global countries are not paying appropriate attention for improving sustainability in environment and its associated sectors. For example, there are many sectors like industries, transport, agricultural, energy, health etc. that have negative impact on environment. However, it is uniformly accepted that sustainable development cannot be achieved sustainability in all production system. Therefore, global countries are struggling to prepare an ecosystem for sustainable development and ensure the social welfare of present and coming generation (Yang et al., 2024). The future of coming generation cannot be sustained without sustainability. Sustainable development is a current need for global countries due to limited and scarce natural resources, and rising the dietary pattern and diverse need of consumers in social and economic dimensions (Hong & Xiao, 2024). Sustainable development is an operative to increase the equilibrium in the production system and solve the diverse need of people for increasing their well-being and welfare (Ozturk et al., 2024). Sustainability in the resources is supportive for developing a path for economic and inclusive growth (Li et al., 2024). It implies that global countries should pursue favourable policies to increase and promote sustainability (Li et al., 2024). Thereafter, the global countries can be successful to attain SDGs by the 2030s. Nowadays, the application of digitalization, digital technologies and ICT are providing the greater benefits to attain SDGs world-wide.

This chapter develops the economic sustainability index (*ECSI*), social sustainability index (*SOSI*), environmental sustainability index (*ENSI*), *SDGI* and digital infrastructure index (*DII*) for G20 countries during 2004–2022. Further, these indexes are used to explain the cross comparison of G20 countries in the above-mentioned indicators. In this chapter, *ECSI* is defined as a combination of multiple indicators that enhance economic sustainability. *SOSI* is the integration of diverse indicators that are conducive to promote social sustainability. *SOSI* provides the relative strength of G20 countries in the social sector. *ENSI* is the inclusion of multiple indicators that have crucial impact on environment and natural resources. The *SDGI* is the linear average sum of *ECSI*, *SOCI* and *ENSI*. Finally, *DII* is the integration of diverse indicators which enhance availability, accessibility, and affordability (AAA) of digital technologies. These indicators also create a favourable system of digitalization.

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