

Industry, Innovation and Infrastructure

G. Kavinselvakumar¹, S.K. Kishore²

^{1,2} *II B.Com CS CA, Department of Commerce in Corporate Secretaryship with CA, Dr. N.G.P. Arts and Science College, Kalapatti Road, Coimbatore, India*

Abstract- In this paper, let us discuss the integrity and relationship of industry, innovation, and infrastructure. SDG 9 aims to promote sustainable industrialization, foster innovation, build resilient infrastructure. To achieve economic growth, social development, and climate action, investments in infrastructure, sustainable industrial development, and technological progress are heavily dependent. Constructing new greener infrastructures, retrofitting existing infrastructure systems, and exploiting the potential of smart technologies can greatly contribute to reducing environmental impacts and disaster risks, increasing efficiency in the use of natural resources, and building resilience. Industrialization must make opportunities accessible to all people and be supported by innovation and resilient infrastructure for sustained growth in the face of a rapidly changing global economic landscape and increasing inequalities. Inclusive and sustainable industrialization, together with innovation and infrastructure, can introduce and promote new technologies, facilitate international trade, and enable the efficient use of resources, unleashing dynamic and competitive economic forces that generate employment and income and improving the standard of living for many.

Keywords: Industry, Inequality, Infrastructure, Innovation, Technology.

1.INTRODUCTION

The United Nations General Assembly adopted Sustainable Development Goal 9 (Goal 9 or SDG 9) in 2015, which focuses on "industry, innovation and infrastructure" and is one of the 17 Sustainable Development Goals. Inclusive and sustainable industrialization, combined with innovation and infrastructure, can introduce and promote new technologies, facilitate international trade, and enable the efficient use of resources, unleashing dynamic and competitive economic forces that generate employment and income. To address economic and environmental challenges, such as increased resource

and energy efficiency, innovation and technological progress are essential for finding sustainable solutions. The inclusion of inclusive and sustainable industrial development, resilient infrastructure, and innovation as components of SDG 9 in the 2030 Agenda for Sustainable Development highlights their critical role in achieving sustainable development.

2.SUSTAINABLE DEVELOPMENT

Sustainable development can be defined as an approach to development that strives to balance different and often competing needs, while being mindful of the environmental, social, and economic constraints that society faces. The goal is to meet present needs without compromising the ability of future generations to meet their own needs.

Unfortunately, development is often pursued without considering the broader or future implications. Irresponsible banking practices have led to major financial crises, and our reliance on fossil fuels has contributed to significant changes in the global climate. The longer we continue with unsustainable development practices, the more severe and frequent the consequences are likely to become. That's why it's crucial to take action now.

3.SUSTAINABLE DEVELOPMENT GOAL 9 (SDG 9)

One of the 17 Sustainable Development Goals established by the United Nations General Assembly in 2015 is SDG 9, which focuses on "industry, innovation and infrastructure." The goal aims to promote sustainable industrialization, foster innovation, and develop resilient infrastructure.

SDG 9 includes eight targets and is measured using twelve indicators. The first five targets are outcome targets, which aim to create sustainable, inclusive, and resilient infrastructures, promote sustainable industrialization, increase access to financial services and markets, upgrade industries and infrastructure for

sustainability, and enhance research and upgrade industrial technologies. The remaining three targets are means of implementation targets, which aim to facilitate sustainable infrastructure development in developing countries, support domestic technology development and industrial diversification, and ensure universal access to information and communications technology.

3.1 Outcome Targets of SDG 9

The outcome targets and ways of accomplishing targets categories make up SDG 9's specific targets. The first five targets (9.1–9.5) are outcome targets with clear outcomes in mind, such as encouraging sustainable industrialization, creating resilient infrastructure, improving current infrastructure, strengthening scientific research, and more. The final three targets (9.a–9.c) are means of attaining targets and provide indicators to track development in reaching SDG 9's goal.

Target 9.1 is: "Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and fair access for all".

Target 9.2: Promote inclusive and sustainable industrialization Target 9.2 is "Promote inclusive and sustainable industrialization, and by 2030, to raise significantly the industry's share of employment and GDP in line with national circumstances as well as to double its share in least developed countries

Target 9.3: Increase access to financial services and markets Target 9.3 is: "Increase the access of small-scale industrial and other enterprises, particularly in developing countries, to financial services including affordable credit and their integration into value chains and markets"

Target 9.4: Upgrade all industries and infrastructures for sustainability Target 9.4 is: "By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities"

Target 9.5: Enhance research and upgrade industrial technologies Target 9.5 is "Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular

developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending."

Target 9.a: Facilitate sustainable infrastructure development for developing countries

Target 9.a is: "Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and Small Island Developing States."

Target 9.b: Support domestic technology development and industrial diversification

Target 9.b is: "Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities".

Target 9.c: Universal access to information and communications technology

Target 9.c is: "Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020"

3.2 Challenges of addressing SDG 9

Focusing on all the SDGs while also trying to limit climate temperature increase to 1.5°C above pre-industrial levels is a difficult task. Undeveloped countries face greater challenges than developed countries in achieving SDG 9, which aims to build resilient infrastructure and promote sustainable industrialization. Energy is required for such development, but this would increase carbon emissions, making it challenging to achieve the climate target. The priority should be to limit climate change to 1.5°C, but this does not have to be contradictory to the priorities of developing and emerging economies, as decreasing carbon emissions and limiting temperature rise will improve economic development, decrease overheating economies, and address local air quality concerns.

3.2.1 COVID-19 Pandemic

The world manufacturing growth was said to be declining even before the COVID-19 pandemic began in 2020, and the pandemic hit industries hard, causing disruptions in the value chains of goods and their

supply. The crisis has also affected the digitization of business and services such as video conferencing, healthcare, and teleworking. However, information and communication technologies have been on the frontlines of the COVID-19 response, accelerating the digitalization of many businesses and services, including teleworking and video conferencing systems both in and out of the workplace, as well as improving access to healthcare, education, and essential goods and services.

3.3 Facts About SDG 9

- In 2021, global manufacturing production grew by 7.2 per cent, surpassing its pre-pandemic level, while the global share of manufacturing value added in total GDP increased from 16.2 per cent in 2015 to 16.9 per cent in 2021.
- Globally, the share of manufacturing jobs in total employment declined from 13.7 per cent in 2019 to 13.1 per cent in 2020, and only about one in three small manufacturers are benefiting from a loan or line of credit, with 15.7 per cent of small-scale industries in Africa and 44.2 per cent in Latin America and the Caribbean receiving these forms of credit.
- In 2019, the share of medium- and high-tech manufacturing in total manufacturing was significantly higher in Europe and Northern America compared to sub-Saharan Africa and least developed countries, which had percentages of 21.4 and 10.5, respectively.
- The number of airline passengers travelling internationally sharply fell from 4.5 billion in 2019 to 2.3 billion in 2021, resulting in financial losses of \$324 billion. Domestic air traffic reached 68 per cent of 2019 levels in 2021, while international traffic remained weak at 28 per cent, mostly due to sporadic outbreaks of COVID-19 variants and travel restrictions. However, air cargo traffic exceeded pre-pandemic levels by the beginning of 2021 and is maintaining robust growth, driven by a resurgence of economic activity and a booming e-commerce industry during the pandemic.
- Between 2015 and 2021, 4G network coverage doubled, reaching 88 per cent of the world's population, although 17 per cent of the population in least developed countries and landlocked

developing countries are still without coverage. Furthermore, in least developed countries, 14 per cent of the rural population have no mobile network coverage at all, while another 12 per cent have only 2G coverage.

3.4 Industry

Industry is a key driver of development, contributing to poverty eradication and other development goals, as well as providing opportunities for social inclusion and creating decent employment. As industry develops, it also drives an increase in value addition and encourages investment in skills and education to achieve broader, inclusive and sustainable development objectives. The manufacturing industries are currently transitioning from mass production to customized production, and the adoption of Industry 4.0 is helping to advance manufacturing technologies and increase productivity. Industry 4.0 aims to construct an open, smart manufacturing platform for industrial networked information application, which involves real-time data monitoring, tracking product status and positions, and controlling production processes to meet individualized customer requirements.

3.5 Infrastructure

To understand the distribution and use of natural resources worldwide and the current status of the environment, it is important to first understand infrastructure. Infrastructure is the foundation upon which the structure of an economy is built and powers businesses, connects workers to their jobs, and citizens to opportunities for healthcare and education. Infrastructure construction and operation is one of the primary drivers of environmental change and is not permanent, with some systems nearing the end of their projected design lives. Although some infrastructure remains critical to national and global economies, decommissioning or removal can provide opportunities for ecosystem restoration and economic revitalization without economic or safety concerns. Proactive policy and economic planning is necessary to effectively deal with aging and obsolete infrastructure and ensure sufficient funds are available. The management of infrastructure within an environmental context is inconsistent. The term infrastructure originated in the late 1880s from French,

with infra- meaning below and structure meaning building.

3.6 Innovation

Innovation is the practical application of ideas that lead to the introduction of new goods or services or improvement in offering goods or services, often through the development of more-effective products, processes, services, technologies, or business models that innovators make available to markets, governments, and society; however, innovation is not the same as invention, as it is more likely to involve the practical implementation of an invention.

4.CONCLUSION

Goal 9 seeks to build resilient infrastructure, promote sustainable industrialization, and foster innovation because industry, infrastructure, and innovation have a major impact on the growth and progress of the country. SDG 9 promotes the efficient use of technologies, international trade, and resources, and is an important part of finding solutions for economic and international challenges. Economies with a diversified industrial sector and strong infrastructure sustain less damage and experience faster recovery. Therefore, the main objective of this thesis is to understand the importance of SDG 9 and its consequences.

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