Journal of Infrastructure, Policy and Development 2024, 8(13), 5640.
https://doi.org/10.24294/jipd5640

Review

Circular economy in developing countries for sustainable development: A review

Maria Ghufran[1], Khurram Iqbal Ahmad Khan[1], Muhammad Ali Musarat[2,3], Wesam Salah Alaloul[2,*]

[1] Construction Engineering and Management Department, National University of Sciences and Technology (NUST), Islamabad 44000, Pakistan
[2] Department of Civil and Environmental Engineering, Universiti Teknologi PETRONAS, Bandar Seri Iskandar 32610, Malaysia
[3] Offshore Engineering Centre, Institute of Autonomous System, Universiti Teknologi PETRONAS, Bandar Seri Iskandar 32610, Malaysia
*** Corresponding author:** Wesam Salah Alaloul, wesam.alaloul@utp.edu.my

CITATION

Ghufran M, khan KIA, Musarat MA, Alaloul WS. (2024). Circular economy in developing countries for sustainable development: A review. Journal of Infrastructure, Policy and Development. 8(13): 5640. https://doi.org/10.24294/jipd5640

ARTICLE INFO

Received: 3 April 2024
Accepted: 2 May 2024
Available online: 12 November 2024

Abstract: A significant percentage of any nation's economy comes from the building industry, and its performance can impact overall economic growth and development. This paper aims to identify the similarities and differences between the construction sector (CS) of developed and developing economies in terms of size, growth, and contribution to the Gross domestic product (GDP) to understand the similarities and variances in the CS dynamics, trends, and challenges, and to inform policy decisions and investments through the literature review. The study also explores the factors that affect the CS's performance in both types of economies, such as government policies, market conditions, and technological advancements. This paper concludes that the CS in developed economies is more established and technologically advanced, but there is still significant room for growth in developing economies. Moreover, a framework is proposed that could assist developing nations in opting for the construction economy. Further, the review emphasizes the significance of government policies and investments in infrastructure development to stimulate the CS's growth and support overall economic development. The results of the study will assist in enhancing understanding of the CS's potential in both developed and developing economies and support decision-making for policymakers, industry practitioners, and academicians.

Keywords: circular economy; GDP; developing countries; sustainability

1. Introduction

The construction sector (CS) is vital to the economy and strongly relates to the Gross Domestic Product (GDP) (Benachio et al., 2020, Musarat et al., 2022b). The CS includes a wide range of activities, from building homes and commercial structures to constructing infrastructure such as roads, bridges, and airports. The jobs created by the CS can have a multiplier effect on the economy, as these workers spend their salaries on goods and services, creating additional jobs in other sectors (Alaloul et al., 2021b; Sui Pheng et al., 2019). The CS is also an important indicator of economic growth. When the economy is expanding, demand for new construction projects tends to increase (Guerra and Leite, 2021), leading to a rise in construction activity (Alaloul et al., 2021c; Chuai et al., 2021). Conversely, when the economy is contracting, construction activity tends to slow down, as fewer projects are initiated and existing projects are put on hold (Hossain et al., 2020). In the United States, for example, the CS accounts for approximately 4% of GDP. In developing countries, the contribution of the CS to GDP can be even higher, as governments invest in infrastructure to support economic growth. Overall, the CS is a crucial part of the economy and is closely connected to GDP. **Figure 1** represents the annual GDP rate

of developing economies (Economics). Its impact on job creation and economic growth makes it an important sector to monitor for policymakers and investors alike (Guerra and Leite, 2021).

Figure 1. GDP of developing economies (economics).

In a Circular Economy (CE), resources are kept in use through strategies such as recycling, reusing, repairing, and repurposing, rather than being discarded after a single use (Antikainen et al., 2018). The CE offers numerous benefits, such as reducing greenhouse gas emissions, conserving natural resources, and creating new business opportunities in areas such as recycling and waste management (Joensuu et al., 2020). Sustainable development is defined as development that fulfills present-day requirements without threatening the potential of future generations to adequately meet their own needs (Ghufran et al., 2022). It is a concept that considers the economic, social, and environmental aspects of development, intending to achieve a balance between them (Corona et al., 2019). The United Nations established a set of Sustainable Development Goals (SDGs) to direct global efforts towards attaining sustainable development since it is a global concern (Sachs et al., 2019). Among these objectives are the eradication of poverty and hunger, the advancement of sustainable agriculture, the provision of clean water and sanitation, the promotion of renewable energy, and the development of sustainable towns and cities (Pradhan et al., 2017).

CS is a substantial contributor to the worldwide economy and is essential for the development and growth of many countries (Alaloul et al., 2021a, Ghufran et al., 2022;Oladinrin et al., 2012). As such, understanding the economics of construction is critical for stakeholders, including investors, developers, contractors, and policymakers (Oke et al., 2019). Construction economics is a field of study that is focused on the financial aspects of construction projects (Khan et al., 2022). It involves the application of economic principles and concepts to the CS. The goal of construction economics is to help stakeholders understand the financial implications of various decisions throughout the project life cycle (Ball, 2014). Construction economics encompasses a broad range of topics, including project feasibility analysis, cost estimation, construction financing, risk management, and procurement. It also covers issues related to sustainability and environmental impact, as well as social and economic benefits (de Valence, 2022, Musarat et al., 2022a). It is essential

to ensure that construction projects are economically viable and sustainable, and construction economics provides the tools and techniques necessary to achieve this (Alba-Rodríguez et al., 2017; Altaf et al., 2020). As CS continues to evolve, the field of construction economics will continue to play an essential role in shaping its future (Myers, 2022).

The construction economy is critical to a country' or region's overall economic development, contributing to economic growth, job creation, infrastructure development, investment, and capital formation (Guerra and Leite, 2021). It does, however, encounter obstacles and weaknesses that have an impact on its performance and sustainability. The industry produces jobs at all skill levels, from architects and engineers to construction laborers and technicians. Furthermore, the CS stimulates other industries. It drives economic activity in industries such as manufacturing, transportation, and finance by creating demand for raw materials, equipment, and services. Another key part of the building industry is infrastructure development (Guerra and Leite, 2021, Musarat et al., 2020). Construction projects help to build critical infrastructure such as transportation networks, utilities, and public amenities. These initiatives boost connectivity, encourage trade, and facilitate economic activity. Well-developed infrastructure draws investments and increases production. For example, efficient transportation networks improve logistics and lower transportation costs, allowing a country or region to prosper (Hossain et al., 2020).

The construction economy is equally important for investment and capital generation (Benachio et al., 2020). Construction projects necessitate significant investments from both public and private sources. Construction investment helps in capital formation, which is necessary for long-term economic growth (Pheng et al., 2019). The construction business serves as a stimulus for real estate, housing, and commercial property developments. These investments not only generate assets, but also boost economic activity through related businesses such as construction materials, furnishings, and appliances. Furthermore, infrastructure and building construction increases property values and capital appreciation, encouraging additional investment. The building industry has a multiplier effect on other industries. Direct investment in construction projects stimulates economic activity in adjacent industries. Demand for construction materials, for instance, drives the manufacturing sector, producing employment and money. Similarly, the demand for construction materials and equipment transportation fuels the logistics industry. As a result, the construction economy provides indirect economic advantages, multiplying its impact on the whole economy (Benachio et al., 2020). However, the CS is not without its difficulties and risks. Its performance is tightly linked to economic cycles, with its performance varying in unison with overall economic conditions. Construction projects are frequently in high demand during periods of economic boom. In contrast, during economic downturns, the CS may see a drop in activity, resulting in job losses and lower investments. Furthermore, changes in government policies, regulatory frameworks, and market conditions can have an impact on project viability, funding availability, and profitability (Guerra and Leite, 2021).

The building industry is also confronted with issues of sustainability and environmental effects (Hobson, 2021). Carbon emissions, garbage creation, and

environmental deterioration are all caused by industry. As a result, there is a rising need for sustainable construction methods to lessen the sector's environmental impact and support long-term sustainability, such as green building design, energy-efficient technologies, and waste management strategies. To better comprehend the idea and effects of the construction economy, this review study sets out to address the issues raised in the discussion. The paper throws light on the concept of construction economy. Further, compares the state of the construction economy in developed and emerging nations. Additionally, a conceptual framework has been proposed. In the end, a discussion section is provided followed by a conclusion and recommendations.

2. Concept of construction economy

Construction economics is an interdisciplinary field of study that focuses on the economic aspects of CS (Benachio et al., 2020). The CS plays a significant role in the global economy, contributing to economic growth, creating employment opportunities, and providing the essential infrastructure for society. As such, the efficient management of construction projects and the broader economic context in which the CS operates are essential concerns of construction economics. One of the central concerns of construction economics is the management of construction projects (Adams et al., 2017; Castles, 2016) that are complex, time-consuming, and involve the allocation of a wide range of resources, including labour, materials, and equipment (Musarat et al., 2021). The efficient management of these resources is critical to the successful completion of construction projects within budget and on time. Inadequate management of resources can lead to delays, cost overruns, and even project failure. Therefore, construction economics seeks to understand the factors that affect the efficient management of construction resources, including the availability of skilled labor, the availability of materials, and the impact of technology on the construction process (Alba-Rodríguez et al., 2017; Hwang and Ng, 2013). The following graph in **Figure 2** shows the year-wise publications as per the Scopus database (Scopus, 2023) of the last two decades in the domain of construction economics (Chawla and Goyal, 2022; Lazar and Chithra, 2020).

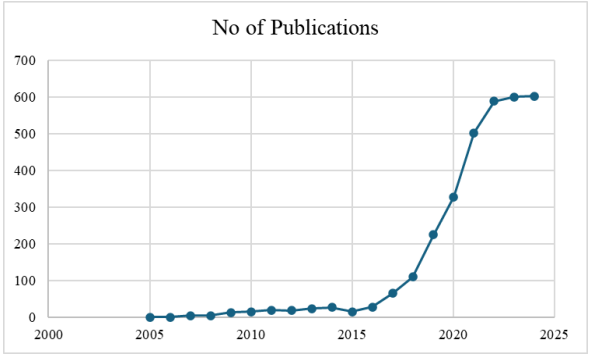

Figure 2. Year-wise publications on the construction economy (Scopus, 2023).

Table 1. Factors affecting the construction economy.

S. No	Factors		Source	Remarks
1	Economic Conditions	Interest rates	Adeleke et al. (2021)	Interest rates play a crucial role in shaping economic activity and financial decision-making.
		Inflation	Stasiak-Betlejewska and Potkány (2015)	Inflation erodes purchasing power and can impact economic stability.
		Unemployment rates	Stetsenko et al. (2020)	Unemployment rates reflect the labour market dynamics and the overall health of the economy.
2	Government Policies	Policies relating to land use	Yu et al. (2022b)	Land use policies shape urban development, environmental conservation, and socioeconomic patterns.
		Zoning laws	Yu et al. (2022a)	Zoning laws regulate land use and promote orderly development within specific areas or districts.
		Building codes	Taofeeq et al. (2020)	Building codes ensure safety, structural integrity, and adherence to standards in construction projects
3	Materials and Labour Costs	Fluctuations in the cost of materials	Adjepon-Yamoah (2019)	Fluctuations in material costs impact construction budgets and project profitability.
		Availability of skilled labour	Agrawal et al. (2021)	The availability of skilled labour affects project timelines and the quality of construction.
4	Technology Incorporation	High-Technology	Coelho and De Brito (2013)	High technology advancements drive innovation, productivity, and competitiveness in various industries.
5	Environmental Factors	Sustainability	Ahmed et al. (2022)	Sustainability practices promote environmental responsibility and long-term societal well-being.
		Carbon emissions	Hughes and Thorpe (2014)	Reducing carbon emissions is crucial for mitigating climate change and ensuring a sustainable future.
		Green building practices	Soewin and Chinda (2018)	Green building practices promote energy efficiency, resource conservation, and healthier environments.
6	Political Factors	Political instability	Abadi et al. (2021)	Political instability can hinder economic growth, investment, and social development.
		Conflicts	Adeleke et al. (2018)	Conflicts disrupt social harmony, economic progress, and overall stability.
		Changes in government	Ackerman (2013)	Government changes can bring policy shifts, impacting the business environment and investor confidence.
7	Infrastructure Investments	Government spending on infrastructure projects	Grydehøj (2018)	Government spending on infrastructure projects stimulates economic growth and enhances public services and connectivity.
8	Market Demand	Demand for new construction projects	Wong et al. (2008)	The demand for new construction projects reflects economic growth, urbanization, and infrastructure needs.
9	Legal Disputes	Litigation	Saygili et al. (2022)	Litigation can have financial and reputational implications, impacting businesses and individuals involved.
		Contract disputes	Nabi and El-adaway (2022)	Contract disputes can lead to project delays, financial losses, and strained relationships between the parties involved.

Cost-benefit analysis is essential for ensuring that construction projects are financially sustainable and that they provide value for money for stakeholders,

including governments, investors, and the public (Biancardo et al., 2023; Raihan and Said, 2022). Another important area of concern in construction economics is the impact of technological change on CS. Technology has revolutionized the way construction projects are designed, managed, and constructed (Wong et al., 2014). These technological changes have significant economic implications for the CS, as they affect the cost and efficiency of construction projects, the skills required by the workforce, and the overall competitiveness of the industry. The impact of technology on CS is not limited to construction processes. Digital technologies are also transforming the way construction firms interact with their clients and customers. The use of social media, online platforms, and other digital marketing tools is becoming increasingly important for construction firms looking to reach new customers and build their brands. Construction economics seeks to understand the impact of these technological changes on CS and to identify strategies that construction firms can use to remain competitive in an increasingly digital world. Construction economics also considers the broader economic context in which the CS operates (Hobson, 2021; Travush, 2018). For instance, changes in interest rates can affect the cost of borrowing for construction projects, which can impact the number and type of construction projects that are financially viable. Changes in government policies, such as changes to building codes or environmental regulations, can also affect the CS by increasing the cost of construction or changing the types of projects that are permitted (Famiyeh et al., 2017a; Hasan et al., 2018). The factors impacting the construction economy are mentioned in **Table 1**.

Economic conditions such as interest rates, inflation, and unemployment rates affect CS significantly (Feiveson et al., 2020). A strong economy with low interest rates and low unemployment rates results in higher construction activity and demand for new buildings, whereas a weak economy leads to a reduction in construction projects (Alaghbari et al., 2019). For instance, policies relating to land use, zoning laws, and building codes impact the type, location, and cost of construction projects. Government spending on infrastructure projects also affects industry. The cost of materials and labour is a critical factor in CS (Soewin and Chinda, 2018). Fluctuations in the cost of materials such as steel, cement, and lumber can impact project costs, while the availability of skilled labor can affect the construction timeline and project delivery. Technology has played an increasing role in CS (Alaghbari et al., 2019). Advancements in construction technology have led to increased efficiency, reduced costs, and improved quality. However, the adoption of new technologies also requires significant investments and changes in the way construction projects are managed and executed. Environmental regulations and concerns such as sustainability, carbon emissions, and green building practices have become more critical in the CS (Soewin and Chinda, 2018). Construction projects that prioritize environmentally friendly practices and materials are becoming more popular, which affects the overall economy of the industry (Van Tam et al., 2021). Political instability, conflicts, and changes in government can significantly impact CS. These factors can result in changes to policies, laws, and regulations that affect the CS, leading to an increase or decrease in construction activity (Yu et al., 2022b).

3. Construction economy in developed countries

The Construction Economy in developed countries can have a significant impact on the overall economy, as it contributes to infrastructure development, creates jobs, and stimulates demand for goods and services (Adeleke et al., 2018). It is responsible for the creation of critical infrastructure such as buildings, roads, bridges, and other public works projects that form the foundation of economic development. This industry also plays a critical role in providing employment opportunities, both directly and indirectly, and contributes significantly to a country's GDP (Shiha and Dorra, 2023). The contribution of the CS to the Gross Domestic Product (GDP) of industrialized economies varies, but on average it runs between 5% and 10%, according to data from the World Bank. For instance, the CS contributed over 6% of the GDP in the United States in 2020. In the UK, the contribution of CS to the GDP in 2019 was almost 6.6%. In 2020, the CS contributed roughly 5.5% of the GDP in Germany (Khanzode et al., 2021). It's worth noting that the contribution of the CS to the GDP can fluctuate based on several factors such as government policies, market demand, access to financing, and natural disasters, among others. In developed countries, the CS is generally more advanced and sophisticated, with higher levels of technology, automation, and specialization. This can result in higher productivity and efficiency in the construction process, as well as better quality and safety standards.

Despite the sector's significant contribution to economic growth, the CS has faced significant challenges in recent years. In developed economies, the CS has been affected by several factors, including labor shortages, high material costs, and fluctuations in demand (Adeleke et al., 2018). These challenges have impacted the profitability and sustainability of the industry, making it a difficult business for contractors and developers. One of the most significant challenges facing CS in developed economies is the labor shortage. The industry has struggled to attract young talent, and many skilled workers have retired without enough replacements. This has caused a huge skills gap, which has caused numerous building projects to be delayed and cost more than expected. Additionally, the lack of skilled labour has also affected the quality of work, which has led to issues with safety and quality control (Makochekanwa, 2013; Yusof and Kalirajan, 2021).

The high cost of building materials is another challenge that the CS in developed economies has had to deal with. This has had a significant impact on the profitability of the industry, leading to many projects being delayed due to cost overruns. Fluctuations in demand have also impacted CS in developed economies (Newman et al., 2021, Sultan and Alaghbari, 2021). The 2008 financial crisis led to a significant decline in construction activity, leading to high levels of unemployment within the sector. While there has been some recovery since then, the industry still faces significant uncertainty, with demand fluctuating depending on the broader economic conditions (Reifschneider et al., 2015). The COVID-19 pandemic has also had a significant impact on CS in developed economies. Construction was classified as an essential industry in many countries, which allowed work to continue even during lockdowns (Sarvari et al., 2021). However, the pandemic led to significant disruptions in supply chains, leading to delays and cost overruns in many projects.

Additionally, the pandemic has led to a decline in demand for new construction, particularly in the commercial and residential sectors, as people work from home and businesses downside (Sultan and Alaghbari, 2021).

Despite these challenges, the CS in developed economies is expected to continue to grow over the coming years. Governments are investing in infrastructure projects to boost economic growth, and there is a growing demand for sustainable construction practices. Additionally, advances in technology, such as building information modeling (BIM) and digital twins, are helping to improve efficiency and productivity in CS (Sun et al., 2017). The shift towards sustainable construction practices is a particularly significant trend in the CS in developed economies. Governments and private companies are increasingly demanding sustainable and environmentally friendly construction methods. Due to this, there is an increase in demand for eco-friendly structures and renewable energy infrastructure, like solar and wind farms (Song et al., 2017). Adopting sustainable construction methods can assist in saving construction expenses in the long run in addition to being good for the environment. In industrialized economies, CS is changing as a result of the usage of technology. Digital tools such as BIM, which allows contractors to create a 3D model of a building before construction begins, are helping to improve efficiency and reduce costs (Merschbrock and Munkvold, 2015). Digital twins, which create a virtual replica of a building, are also becoming increasingly popular, allowing contractors to identify potential issues and optimize building performance before construction even begins (Awoyera and Adesina, 2020). In conclusion, the CS in developed economies faces significant challenges, including labor shortages, high material costs, fluctuations in demand, and the COVID-19 pandemic. However, the industry is expected to continue to grow, with governments investing in infrastructure projects and a growing demand for sustainable construction practices.

4. Construction economy in developing countries

To foster economic growth and development, the building industry in emerging nations can contribute significantly. The contribution of the CS to the Gross Domestic Product (GDP) of developing economies also varies greatly, according to the World Bank. The average contribution of CS to the GDP of developing nations is between 4% and 8%. For instance, in India, the CS contributed 7.7% of the GDP in that year. In 2020, China's CS contributed 6.4% of the country's GDP. In Brazil, the CS contributed 4.2% of the country's GDP in 2020 (Sila, 2019). However, it's crucial to remember that the contribution of the CS to the GDP of developing nations can be affected by several elements, including governmental policies, access to funding, and the degree of infrastructural development, among others.

Construction activities in developing countries can create jobs, stimulate demand for goods and services, and contribute to infrastructure development (Agrawal et al., 2021). However, CS in developing countries also faces various challenges, such as a lack of skilled labor, inadequate infrastructure, insufficient funding, and weak regulatory frameworks (Guerra and Leite, 2021). These challenges can suspend the growth of the CS and limit its contribution to the overall economy (Porter and Kramer, 2018; Sila, 2019). To address these challenges,

governments and other stakeholders can take various measures, such as investing in education and training to develop a skilled workforce, improving access to financing and credit, promoting public-private partnerships to mobilize resources, and strengthening regulatory frameworks to ensure quality and safety standards are met (Lazar and Chithra, 2020).

CS is essential to a nation's economic development and growth. The CS makes up a large component of the economy in developing nations, and its expansion may benefit the production of jobs, the generation of income, and the improvement of infrastructure. However, the construction economy in developing countries faces unique challenges that must be addressed to ensure sustainable growth and development (Tompkins et al., 2010). One of the major challenges facing the construction economy in developing countries is a lack of infrastructure. Infrastructure development is critical for economic growth and development, but many developing countries lack basic infrastructure, such as roads, bridges, and utilities. This lack of infrastructure makes it difficult to transport materials and equipment to construction sites and to access potential customers. Without proper infrastructure, the CS in developing countries is limited in its ability to grow and contribute to the overall economy (Soewin and Chinda, 2018). Another challenge facing the construction economy in developing countries is the lack of skilled labor. Many developing countries have a large population, but most of the workforce is unskilled or semi-skilled. This means that there is a shortage of trained workers who can perform specialized tasks such as plumbing, electrical work, and carpentry. This shortage of skilled labor can lead to delays and increased costs in construction projects and can ultimately limit the growth of the CS. Many construction projects require a significant upfront investment and access to finance can be difficult to obtain (Oladinrin et al., 2012). This is particularly true for small and medium-sized construction firms that may not have the collateral or credit history needed to secure loans from banks. Without access to finance, construction firms are limited in their ability to take on larger projects and expand their operations.

In addition to these challenges, the CS in developing countries is also affected by issues such as corruption, lack of transparency, and political instability (Padilla-Rivera et al., 2020). Corruption can lead to inefficiencies and inflated costs in construction projects, while a lack of transparency can make it difficult to track the progress and quality of construction projects (Adabre et al., 2022). Political instability can also harm the CS by disrupting supply chains and delaying projects. Despite these challenges, there are several opportunities for the construction economy in developing countries. One of the most significant opportunities is the increasing demand for infrastructure development in these countries (Shoar et al., 2021). As populations grow and urbanization increases, there is a need for new infrastructure to support economic growth and development. This demand for infrastructure creates opportunities for CS to grow and expand (Maseko, 2017). Another opportunity for the construction economy in developing countries is the adoption of new technologies and construction methods. Advances in technology, such as Building Information Modeling (BIM) and prefabrication, can help to increase efficiency and reduce costs in construction projects. By adopting these

technologies and methods, construction firms in developing countries can become more competitive and expand their operations.

Several tactics can be used to overcome the problems that the building industry in emerging nations is facing and to seize these opportunities. Developing infrastructure, such as new roads, bridges, and utilities, is one tactic. This investment can create jobs and provide the necessary infrastructure to support economic growth and development. Another strategy is to invest in education and training programs to develop a skilled labour force. By investing in education and training, developing countries can create a pool of skilled workers who can perform specialized tasks in the CS (Castles, 2016; Elghaish et al., 2022). In the long run, this can serve to fuel the expansion of the CS by reducing costs and delays in projects. In emerging nations, the expansion of the building industry is also essential for economic development. Governments can act to increase construction companies' access to financing, especially for small and medium-sized businesses (Adeleke et al., 2018). This can be achieved through the creation of loan programs, the establishment of credit bureaus, and the provision of guarantees for loans. Finally, efforts must be made to address issues such as corruption and lack of transparency in the CS.

5. Conceptual framework for circular economy

Developing countries face a range of challenges in developing their construction economies, including limited access to finance, a shortage of skilled labor, and a lack of appropriate infrastructure. To address these challenges, a framework has been developed in **Figure 3** to guide policymakers, construction firms, and other stakeholders in developing effective strategies for building a robust and sustainable construction economy. By adopting this framework, policymakers, construction firms, and other stakeholders can work together to create a sustainable construction economy that supports economic growth and development in developing countries. This requires a long-term commitment to investing in infrastructure, developing a skilled workforce, improving access to finance, promoting the use of technology and innovative construction methods, encouraging sustainable construction practices, and fostering partnerships and collaboration. Moreover, engagement of stakeholders, prioritization of strategic planning, and incorporation of green building standards can help to foster the successful implementation of a CE in developing economies.

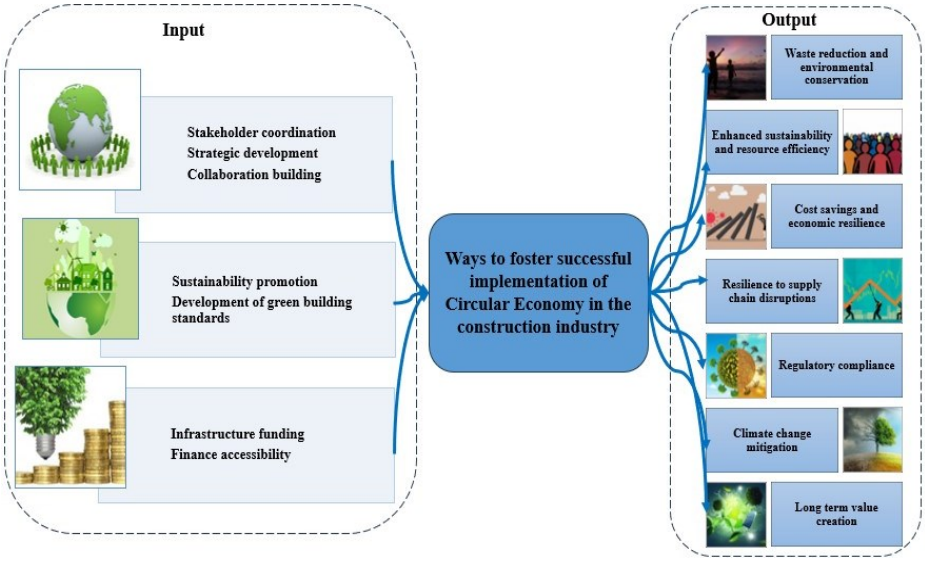

Figure 3. Conceptual framework for successful implementation of circular economy.

Numerous advantages can be gained by the CS when it embraces the concept of a circular economy (Wijewansha et al., 2021). These advantages highlight the industry's capacity to make a substantial contribution to the advancement of sustainable development policies (Suárez-Eiroa et al., 2019). Construction businesses can not only reduce their impact on the environment by emphasizing resource efficiency, cost savings, and waste reduction, but they can also improve their operational efficiency and profitability by doing so (Gupta et al., 2019). In addition, the transition towards circular practices encourages innovation and propels the creation of more environmentally friendly materials, technologies, and construction processes, which places businesses at the forefront of the change of their respective industries. In addition to the economic benefits, CE approaches encourage the preservation of the environment, the resilience of supply chains to shocks, and compliance with regulatory requirements. Furthermore, these approaches encourage community engagement and the development of long-term value. Embracing circularity in the CS is not only a strategic imperative, but it is also a moral commitment, as it aligns with the responsibility of the sector to protect the planet and improve the well-being of both the present generation and the generations to come.

To foster the growth of the construction economy, policymakers should create a supportive regulatory environment that promotes investment and encourages private sector participation. This includes establishing a clear legal framework for construction projects, streamlining administrative procedures, and ensuring transparent and efficient regulatory processes. Developing countries require significant investment in infrastructure to support economic growth and development. Governments should prioritize infrastructure projects that have a high economic and social impact and work to attract private-sector investment through public-private partnerships. Skilled labor is critical to the success of construction projects, and developing countries often face a shortage of skilled workers (Menon and Suresh, 2020). To address this, policymakers should invest in education and training programs that provide the skills necessary for construction work. This includes

vocational training programs, apprenticeships, and on-the-job training. Access to finance is a significant challenge for construction firms in developing countries. Governments can work to improve access to finance by establishing loan programs, creating credit bureaus, and providing guarantees for loans. This can help to reduce the risk of lending to construction firms and encourage investment in the construction economy (Tompkins et al., 2010).

Construction projects can become more efficient and affordable with the aid of cutting-edge technology and construction techniques. Governments and building companies should invest in R&D to find innovative technologies and techniques that may be used for construction projects in developing nations (Myers, 2022). Sustainable building techniques may reduce construction projects' negative environmental effects and support worldwide attempts to slow down global warming. The use of sustainable materials, energy-efficient design, and other green construction techniques should be encouraged by governments and construction companies. Collaboration between governments, construction firms, and other stakeholders is indispensable for building a robust and sustainable construction economy. Governments can work with private sector partners to identify investment opportunities and develop projects that meet the needs of local communities (Ofori, 2022).

6. Discussion

The construction economy in developed and developing economies can differ in various ways, due to differences in economic, social, and environmental contexts. Here is a comparison chart in **Table 2**, highlighting the differences between the CS in developed and developing economies.

Table 2. Comparison chart for the CS in developed and developing economies.

Factors	Developed Economies	Developing Economies	References
Economic Factors	Higher GDP per capita	Lower GDP per capita	Bartolucci et al. (2018)
	Stable and Mature Economy	Emerging and Volatile Economy	Wu et al. (2018)
	High levels of industrialization and infrastructure	Poor or underdeveloped infrastructure	Khan et al. (2022)
	Mature construction sector	Developing construction sector	Huang et al. (2022)
	Higher construction costs	Lower construction costs	Hosseini et al. (2022)
	Higher wages and salaries for workers	Lower wages and salaries for workers	NAZ et al. (2022)
Regulatory Environment	Strict building codes and regulations	Less strict building codes and regulations	Jorgenson (2016)
	Well-established legal system and regulatory framework	Inadequate legal system and regulatory framework	Goedhuys and Sleuwaegen (2016)
	High level of compliance and enforcement	Low level of compliance and enforcement	Ngeno et al. (2022)
	Strong focus on safety and quality control	Weak focus on safety and quality control	Chen et al. (2020)
Market Demand	Mature and saturated market	Emerging and growing market	Buallay (2020)
	High competition and consolidation	Lower competition and fragmentation	Buallay et al. (2021)
	High demand for new technologies and innovation	Less demand for new technologies and innovation	Malca et al. (2020)
	Large-scale and complex projects	Small-scale and simpler projects	Asif and Muneer (2007)
	High level of specialization and expertise	Lower level of specialization and expertise	Buallay (2020)

Table 2. (*Continued*).

Factors	Developed Economies	Developing Economies	References
Workforce	Skilled and experienced workforce	Less skilled and experienced workforce	Bosker et al. (2021)
	Ageing workforce	Young and growing workforce	Khan et al. (2022)
	High level of unionization and collective bargaining	Lower level of unionization and collective bargaining	Buallay et al. (2021)
	High level of worker protection and benefits	Lower level of worker protection and benefits	McPhillips and Licznerska (2021)

One significant difference is the level of technology and automation used in the construction process. Developed economies tend to have more advanced and sophisticated construction processes, with higher levels of technology, automation, and specialization. This can result in higher productivity and efficiency, as well as better quality and safety standards. Developing economies, on the other hand, may have more labour-intensive construction processes, with lower levels of technology and automation. Another difference is the regulatory framework and institutional capacity. Developed economies tend to have more robust regulatory frameworks and institutions to ensure quality and safety standards are met. Building codes and standards are frequently implemented in the CS in developed economies. These codes and standards are enforced by organizations such as the International Code Council (ICC) in the United States or the Building Regulations in the United Kingdom. The protection of workers on construction sites is ensured by occupational safety rules, such as those imposed by the Occupational Safety and Health Administration (OSHA) in the United States. The implementation of quality control techniques such as ISO 9001 certification is also prevalent, which helps to ensure that building projects adhere to the same standards. Under these laws, hazards are reduced, structural integrity is maintained, worker safety is protected, and overall quality is maintained in building projects. Developing economies may have weaker regulatory frameworks and institutions, which can lead to lower quality and safety standards (Agenda, 2016). Access to financing and credit is another factor that can differ between developed and developing economies. Developed economies generally have more developed financial systems and greater access to financing and credit. Developing economies may have more limited access to financing and credit, which can limit investment in the CS. Environmental concerns also differ between developed and developing economies. Developed economies tend to be more aware of environmental issues and have more stringent regulations on environmental impact. Developing economies may have less developed environmental regulations and may be more vulnerable to environmental impacts from construction activities (Tang et al., 2010).

In many developing countries, CS is a significant contributor to the GDP. According to the World Bank, the CS contributes around 8% to the GDP in low-income countries and around 10% in middle-income countries (Sultan and Alaghbari, 2023). The CS is also a significant employer in developing countries, particularly for low-skilled workers. In sub-Saharan Africa, the CS employs around 10% of the labor force. Developing countries require significant investment in infrastructure to support economic growth and development.

Due to higher labor rates, stricter regulations, and superior technology, industrialized countries have greater construction costs than poor countries. Skilled labor is more abundant in industrialized nations, but higher pay raises project costs. Construction expenses rise due to strict building requirements and environmental laws that need more expensive materials and technologies. In industrialized countries, well-established infrastructure reduces logistical obstacles but may raise land and property purchase costs. Despite higher prices, projects in industrialized countries frequently benefit from better efficiency, innovative technologies, and strict quality requirements, resulting in more resilient and sustainable structures. **Table 3** shows developed world construction costs.

Table 3. Construction cost in developed countries (Amin et al., 2021; Asiedu and Adaku, 2020).

Developed Economies	Construction Cost (USD Trillion)
United States	1.5
European Union	1.3
China	2.2
Canada	1.3
Australia	1.4
United Kingdom	1.4

Construction prices in developing countries vary depending on economic conditions, local restrictions, and infrastructural availability. Labor costs are lower in many developing nations, but restricted access to skilled labor, poor transportation networks, and variable material prices can negate these advantages. Lack of construction standards and regulatory frameworks may also affect project deadlines and prices (Famiyeh et al., 2017b). Despite reduced labor costs, social, economic, and logistical issues can affect building costs in underdeveloped countries, requiring a sophisticated approach to project planning and execution (Zarfl et al., 2015). **Table 4** shows developed world construction costs.

Table 4. Construction cost in developing countries (Amin et al., 2021; Asiedu and Adaku, 2020).

Developing Economies	Construction Cost (USD Trillion)
India	1.2
Brazil	0.9
South Africa	0.5
Nigeria	0.8
Indonesia	0.6
Mexico	0.5

Figure 4 shows that developed countries have greater construction costs as blue lines indicate the case of the developed world and orange lines represent the developing world. Costs associated with construction are typically greater in developed nations for several different reasons. More stringent restrictions in these

regions typically result in more stringent compliance with safety and environmental requirements, which necessitates the allocation of more resources and the knowledge of specialists. Labor costs have increased because of increased pay, improved working conditions, and stricter laws governing the labor market. The costs of materials have also increased, in part because of the availability of more advanced construction materials and the quality standards that have been implemented (Amin et al., 2021). Furthermore, advanced building standards and technology that are widespread in developed economies contribute to greater construction prices (Sparrevik et al., 2021). This is because projects frequently require cutting-edge materials, designs, and techniques, which adds to the overall expenditure. When taken together, these variables contribute to the fact that the cost of construction in industrialized nations is significantly higher than in emerging country economies (Asiedu and Adaku, 2020).

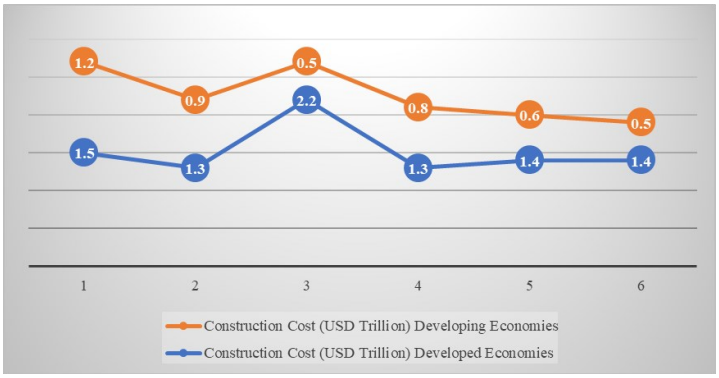

Figure 4. Comparison of construction costs in developed and developing countries (Amin et al., 2021; Asiedu and Adaku, 2020).

According to the United Nations, developing countries need to invest around $4.5 trillion per year in infrastructure until 2030 (Jones and Comfort, 2018). Developing countries face a range of challenges in developing their construction economies, including limited access to finance, a shortage of skilled labour, and a lack of appropriate infrastructure. Despite these challenges, CS in developing countries has significant growth potential. According to a report by McKinsey Global Institute, the CS in developing countries could more than double in size by 2025 (Wijewansha et al., 2021). These statistics highlight the importance of CS in developing economies and the need for strategies that support the growth and development of the sector. By addressing the challenges and leveraging the growth potential, developing countries can build a robust and sustainable construction economy that supports economic growth and development. In summary, while the construction economy can play a significant role in promoting economic growth and development in both developed and developing economies, there can be significant differences in the context, regulatory framework, and environmental concerns between the two types of economies (Dang and Pheng, 2015; Porter and Kramer, 2018).

In the first place, there needs to be a paradigm shift away from the conventional linear model of production and consumption and towards a model that emphasizes resource efficiency, waste reduction, and closed-loop systems (Agrawal et al., 2021).

To do this, it is necessary to redefine economic success not exclusively based on development but also other aspects, such as the productivity of resources and the sustainability of the environment (Abadi et al., 2021). Regarding the second point, legal frameworks and policies are of critical importance in the process of encouraging firms and industries to embrace circular practices (NAZ et al., 2022). To promote environmentally responsible design, product stewardship, extended producer responsibility, and the formation of markets for secondary resources, policies should be implemented (Padilla-Rivera et al., 2020). In addition, it is vital to encourage collaboration between diverse stakeholders, such as governments, businesses, academic institutions, and civil society organizations, to facilitate the sharing of knowledge, the development of innovative ideas, and the expansion of circular initiatives (Rehman Khan et al., 2022). Moreover, education and awareness-raising initiatives are essential to change the behavior of consumers toward consumption patterns that are more environmentally friendly and to cultivate a culture that values recycling, repairing, and avoiding waste. In conclusion, technical advancement and digitalization have the potential to dramatically improve the implementation of circular strategies. This is because they make it possible to monitor, trace, and optimize the flow of resources across the value chain (Sparrevik et al., 2021). A comprehensive conceptual framework for the successful implementation of the CE incorporates systemic changes in governance, company practices, consumer behavior, and technological innovation in order to transition towards an economic model that is more sustainable and regenerative (Shiha and Dorra, 2023).

7. Conclusion

In conclusion, the construction sector (CS) is crucial to any nation's economic growth and development. This report examined the construction sectors in industrialised and developing nations to determine their similarities, differences, and performance determinants. While rich economies have well-established and highly proficient construction sectors, developing nations have room for expansion. This paper proposes a framework for developing countries to maximise their construction potential. This research emphasises the significance of proactive actions to boost CS growth and economic growth, emphasising government policies and infrastructure investments. This study helps policymakers, industry stakeholders, and academic researchers make informed decisions and promote sustainable development by improving our understanding of the construction sector's dynamics and potential across diverse economic landscapes.This review study emphasizes the significance of the CS as an important driver powering economic growth and development in both developed and emerging economies. The study determined the elements influencing the CS's performance as well as the similarities and variations between the CS in developed and emerging nations. Moreover, the review highlighted the challenges faced by developing economies in the CS and provided strategies to overcome them. The proposed framework for developing nations could assist in achieving optimal performance in the construction economy. Finally, this review emphasizes the critical role of government policies and investments in infrastructure

development to stimulate the CS's growth and support overall economic development. It is hoped that the findings of this review will contribute to a better understanding of CS's potential in both developed and developing economies and support decision-making for policymakers, industry practitioners, and academics. This comprehensive assessment emphasizes the CS's critical role in promoting economic growth and development in both industrialized and emerging economies. By analyzing several elements influencing, the CS's performance, the study not only highlights the similarities and differences between developed and emerging economies but also throws light on the issues that developing economies confront in the building industry. Furthermore, the assessment includes strategic insights to help emerging countries traverse these obstacles, including a methodology for optimizing the performance of their building economies. The paper emphasizes the critical importance of government policies and investments in infrastructure development and calls for proactive steps to boost growth in the CS, hence promoting overall economic development.

Acknowledgments: The authors would like to thank the Universiti Teknologi PETRONAS (UTP) for the support from the (cost centre 015LC0-369) awarded to Wesam Salah Alaloul.

Conflict of interest: The authors declare no conflict of interest.

References

Abadi, M., Moore, D. R. & Sammuneh, M. A. (2021). A Framework Of Indicators To Measure Project Circularity In Construction Circular Economy. In: Proceedings Of The Institution Of Civil Engineers-Management, Procurement And Law, 40, 1-13.

Ackerman, F. (2013). Why Do We Recycle?: Markets, Values, And Public Policy. Island Press.

Adabre, M. A., Chan, A. P. C., Edwards, D. J., et al. (2022). To build or not to build, that is the uncertainty: Fuzzy synthetic evaluation of risks for sustainable housing in developing economies. Cities, 125, 103644. https://doi.org/10.1016/j.cities.2022.103644

Adams, K. T., Osmani, M., Thorpe, T., et al. (2017). Circular economy in construction: current awareness, challenges and enablers. Proceedings of the Institution of Civil Engineers - Waste and Resource Management, 170(1), 15–24. https://doi.org/10.1680/jwarm.16.00011

Adeleke, A. Q., Bahaudin, A. Y., Kamaruddeen, A. M., et al. (2018). The Influence of Organizational External Factors on Construction Risk Management among Nigerian Construction Companies. Safety and Health at Work, 9(1), 115–124. https://doi.org/10.1016/j.shaw.2017.05.004

Adeleke, O., Akinlabi, S., Jen, T.-C., et al. (2021). Towards sustainability in municipal solid waste management in South Africa: a survey of challenges and prospects. Transactions of the Royal Society of South Africa, 76(1), 53–66. https://doi.org/10.1080/0035919x.2020.1858366

Agenda, I. (2016). Shaping The Future Of Construction A Breakthrough In Mindset And Technology. World Economic Forum,.

Agrawal, R., Wankhede, V. A., Kumar, A., et al. (2021). Nexus of circular economy and sustainable business performance in the era of digitalization. International Journal of Productivity and Performance Management, 71(3), 748–774. https://doi.org/10.1108/ijppm-12-2020-0676

Ahmed, R., Hussain, A., & Philbin, S. P. (2021). Moderating Effect of Senior Management Support on the Relationship Between Schedule Delay Factors and Project Performance. Engineering Management Journal, 34(3), 374–393. https://doi.org/10.1080/10429247.2021.1940033

Alaghbari, W., Al-Sakkaf, A. A., & Sultan, B. (2017). Factors affecting construction labour productivity in Yemen. International Journal of Construction Management, 19(1), 79–91. https://doi.org/10.1080/15623599.2017.1382091

Alaloul, W. S., Musarat, M. A., Liew, M. S., et al. (2021). Investigating the impact of inflation on labour wages in Construction Industry of Malaysia. Ain Shams Engineering Journal, 12(2), 1575–1582. https://doi.org/10.1016/j.asej.2020.08.036

Alba-Rodríguez, M. D., Martínez-Rocamora, A., González-Vallejo, P., et al. (2017). Building rehabilitation versus demolition and new construction: Economic and environmental assessment. Environmental Impact Assessment Review, 66, 115–126. https://doi.org/10.1016/j.eiar.2017.06.002

Ali Musarat, M., Irfan, M., Salah Alaloul, W., et al. (2022). Circular Economy - Recent Advances in Sustainable Construction Waste Management. The Circular Economy - Recent Advances in Sustainable Waste Management. https://doi.org/10.5772/intechopen.105050

Amelina, A. Horvath, K. & Meeus, B. (editors). (2016). An Anthology of Migration and Social Transformation. Springer International Publishing. https://doi.org/10.1007/978-3-319-23666-7

Amin, A., Liu, X.-H., Abbas, Q., et al. (2020). Globalization, sustainable development, and variation in cost of power plant technologies: A perspective of developing economies. Environmental Science and Pollution Research, 28(9), 11158–11169. https://doi.org/10.1007/s11356-020-10816-x

Antikainen, M., Uusitalo, T., & Kivikytö-Reponen, P. (2018). Digitalisation as an Enabler of Circular Economy. Procedia CIRP, 73, 45–49. https://doi.org/10.1016/j.procir.2018.04.027

Asiedu, R. O., & Adaku, E. (2019). Cost overruns of public sector construction projects: a developing country perspective. International Journal of Managing Projects in Business, 13(1), 66–84. https://doi.org/10.1108/ijmpb-09-2018-0177

Asif, M., & Muneer, T. (2007). Energy supply, its demand and security issues for developed and emerging economies. Renewable and Sustainable Energy Reviews, 11(7), 1388–1413. https://doi.org/10.1016/j.rser.2005.12.004

Awoyera, P. O., & Adesina, A. (2020). Plastic wastes to construction products: Status, limitations and future perspective. Case Studies in Construction Materials, 12, e00330. https://doi.org/10.1016/j.cscm.2020.e00330

Ball, M. (2014). Rebuilding Construction (Routledge Revivals). Routledge. https://doi.org/10.4324/9781315816715

Bartolucci, F., Choudhry, M. T., Marelli, E., et al. (2018). GDP dynamics and unemployment changes in developed and developing countries. Applied Economics, 50(31), 3338–3356. https://doi.org/10.1080/00036846.2017.1420894

Benachio, G. L. F., Freitas, M. do C. D., & Tavares, S. F. (2020). Circular economy in the construction industry: A systematic literature review. Journal of Cleaner Production, 260, 121046. https://doi.org/10.1016/j.jclepro.2020.121046

Biancardo, S. A., Gesualdi, M., Savastano, D., et al. (2023). An innovative framework for integrating Cost-Benefit Analysis (CBA) within Building Information Modeling (BIM). Socio-Economic Planning Sciences, 85, 101495. https://doi.org/10.1016/j.seps.2022.101495

Bosker, M., Park, J., & Roberts, M. (2021). Definition matters. Metropolitan areas and agglomeration economies in a large-developing country. Journal of Urban Economics, 125, 103275. https://doi.org/10.1016/j.jue.2020.103275

Buallay, A. M. (2020). Sustainability reporting and bank's performance: comparison between developed and developing countries. World Review of Entrepreneurship, Management and Sustainable Development, 16(2), 187. https://doi.org/10.1504/wremsd.2020.105992

Buallay, A., Fadel, S. M., Alajmi, J., et al. (2020). Sustainability reporting and bank performance after financial crisis. Competitiveness Review: An International Business Journal, 31(4), 747–770. https://doi.org/10.1108/cr-04-2019-0040

Calinescu, R. & Di Giandomenico, F. (editors). (2019). Software Engineering for Resilient Systems. Springer International Publishing. https://doi.org/10.1007/978-3-030-30856-8

Chawla, R. N., & Goyal, P. (2021). Emerging trends in digital transformation: a bibliometric analysis. Benchmarking: An International Journal, 29(4), 1069–1112. https://doi.org/10.1108/bij-01-2021-0009

Chen, J., Shabunina, A., Roaf, J., et al. (2020). EU Climate Mitigation Policy. Departmental Papers, 2020(013), 1. https://doi.org/10.5089/9781513552569.087

Chuai, X., Lu, Q., Huang, X., et al. (2021). China's construction industry-linked economy-resources-environment flow in international trade. Journal of Cleaner Production, 278, 123990. https://doi.org/10.1016/j.jclepro.2020.123990

Coelho, A., & de Brito, J. (2013). Economic viability analysis of a construction and demolition waste recycling plant in Portugal – part I: location, materials, technology and economic analysis. Journal of Cleaner Production, 39, 338–352. https://doi.org/10.1016/j.jclepro.2012.08.024

Corona, B., Shen, L., Reike, D., et al. (2019). Towards sustainable development through the circular economy—A review and critical assessment on current circularity metrics. Resources, Conservation and Recycling, 151, 104498. https://doi.org/10.1016/j.resconrec.2019.104498

Dang, G., & Sui Pheng, L. (2015). Infrastructure Investments in Developing Economies. Springer Singapore. https://doi.org/10.1007/978-981-287-248-7

de Valence, G. (2022). The nature and development of construction economics. Research Companion to Construction Economics, 61–85. https://doi.org/10.4337/9781839108235.00011

Economics, Trading. (n.d.) Gdp Annual Growth Rate. Available online: Https://Tradingeconomics.Com/Country-List/Gdp-Annual-Growth-Rate (accessed 14 June 2023).

Elghaish, F., Matarneh, S. T., Edwards, D. J., et al. (2022). Applications of Industry 4.0 digital technologies towards a construction circular economy: gap analysis and conceptual framework. Construction Innovation, 22(3), 647–670. https://doi.org/10.1108/ci-03-2022-0062

Famiyeh, S., Amoatey, C. T., Adaku, E., et al. (2017). Major causes of construction time and cost overruns. Journal of Engineering, Design and Technology, 15(2), 181–198. https://doi.org/10.1108/jedt-11-2015-0075

Famiyeh, S., Amoatey, C. T., Adaku, E., et al. (2017). Major causes of construction time and cost overruns. Journal of Engineering, Design and Technology, 15(2), 181–198. https://doi.org/10.1108/jedt-11-2015-0075

Feiveson, L., Goernemann, N., Hotchkiss, J., et al. (2020). Distributional Considerations for Monetary Policy Strategy. Finance and Economics Discussion Series, 2020(070), 1–27. https://doi.org/10.17016/feds.2020.073

Ghufran, M., Khan, K. I. A., Ullah, F., et al. (2022). Circular Economy in the Construction Industry: A Step towards Sustainable Development. Buildings, 12(7), 1004. https://doi.org/10.3390/buildings12071004

Goedhuys, M., & Sleuwaegen, L. (2016). International standards certification, institutional voids and exports from developing country firms. International Business Review, 25(6), 1344–1355. https://doi.org/10.1016/j.ibusrev.2016.04.006

Grydehøj, A. (2018). Decolonising The Economy In Micropolities: Rents, Government Spending And Infrastructure Development In Kalaallit Nunaat (Greenland). Small States & Territories, 1, 69-94.

Guerra, B. C., & Leite, F. (2021). Circular economy in the construction industry: An overview of United States stakeholders' awareness, major challenges, and enablers. Resources, Conservation and Recycling, 170, 105617. https://doi.org/10.1016/j.resconrec.2021.105617

Gupta, S., Chen, H., Hazen, B. T., et al. (2019). Circular economy and big data analytics: A stakeholder perspective. Technological Forecasting and Social Change, 144, 466–474. https://doi.org/10.1016/j.techfore.2018.06.030

Hasan, A., Baroudi, B., Elmualim, A., et al. (2018). Factors affecting construction productivity: a 30 year systematic review. Engineering, Construction and Architectural Management, 25(7), 916–937. https://doi.org/10.1108/ecam-02-2017-0035

Hobson, K. (2020). The limits of the loops: critical environmental politics and the Circular Economy. Environmental Politics, 30(1–2), 161–179. https://doi.org/10.1080/09644016.2020.1816052

Hossain, Md. U., Ng, S. T., Antwi-Afari, P., et al. (2020). Circular economy and the construction industry: Existing trends, challenges and prospective framework for sustainable construction. Renewable and Sustainable Energy Reviews, 130, 109948. https://doi.org/10.1016/j.rser.2020.109948

Hosseini, E., Saeida Ardekani, S., Sabokro, M., et al. (2022). The study of knowledge employee voice among the knowledge-based companies: the case of an emerging economy. Revista de Gestão, 29(2), 117–138. https://doi.org/10.1108/rege-03-2021-0037

Huang, Y., Haseeb, M., Usman, M., et al. (2022). Dynamic association between ICT, renewable energy, economic complexity and ecological footprint: Is there any difference between E-7 (developing) and G-7 (developed) countries? Technology in Society, 68, 101853. https://doi.org/10.1016/j.techsoc.2021.101853

Hughes, R., & Thorpe, D. (2014). A review of enabling factors in construction industry productivity in an Australian environment. Construction Innovation, 14(2), 210–228. https://doi.org/10.1108/ci-03-2013-0016

Hwang, B.-G., & Ng, W. J. (2013). Project management knowledge and skills for green construction: Overcoming challenges. International Journal of Project Management, 31(2), 272–284. https://doi.org/10.1016/j.ijproman.2012.05.004

Joensuu, T., Edelman, H., & Saari, A. (2020). Circular economy practices in the built environment. Journal of Cleaner Production, 276, 124215. https://doi.org/10.1016/j.jclepro.2020.124215

Jones, P. & Comfort, D. (2018). The Construction Industry And The Circular Economy. International Journal Of Management Cases, 20, 4-15.

Jorgenson, A. (2016). The sociology of ecologically unequal exchange, foreign investment dependence and environmental load displacement: summary of the literature and implications for sustainability. Journal of Political Ecology, 23(1). https://doi.org/10.2458/v23i1.20221

Khan, S. A. R., Ponce, P., Yu, Z., et al. (2022). Investigating economic growth and natural resource dependence: An asymmetric approach in developed and developing economies. Resources Policy, 77, 102672. https://doi.org/10.1016/j.resourpol.2022.102672

Khan, S. A. R., Yu, Z., Sarwat, S., et al. (2021). The role of block chain technology in circular economy practices to improve organisational performance. International Journal of Logistics Research and Applications, 25(4–5), 605–622. https://doi.org/10.1080/13675567.2021.1872512

Khanzode, A. G., Sarma, P. R. S., Mangla, S. K., et al. (2021). Modeling the Industry 4.0 adoption for sustainable production in Micro, Small & Medium Enterprises. Journal of Cleaner Production, 279, 123489. https://doi.org/10.1016/j.jclepro.2020.123489

Lazar, N., & Chithra, K. (2020). A comprehensive literature review on development of Building Sustainability Assessment Systems. Journal of Building Engineering, 32, 101450. https://doi.org/10.1016/j.jobe.2020.101450

Lenssen, G. G., & Smith, N. C. (editors). (2019). Managing Sustainable Business. Springer Netherlands. https://doi.org/10.1007/978-94-024-1144-7

Makochekanwa, A. (2013). An Analysis Of Tourism Contribution To Economic Growth In Sadc Countries. Botswana Journal Of Economics, 11.

Malca, O., Peña-Vinces, J., & Acedo, F. J. (2019). Export promotion programmes as export performance catalysts for SMEs: insights from an emerging economy. Small Business Economics, 55(3), 831–851. https://doi.org/10.1007/s11187-019-00185-2

Maseko, C. M. (2018). Identification of risk factors affecting construction of projects: The case of emerging economy. Risk Governance and Control: Financial Markets and Institutions, 7(4–2), 246–259. Portico. https://doi.org/10.22495/rgc7i4c2art7

McPhillips, M., & Licznerska, M. (2021). Open Innovation Competence for a Future-Proof Workforce: A Comparative Study from Four European Universities. Journal of Theoretical and Applied Electronic Commerce Research, 16(6), 2442–2457. https://doi.org/10.3390/jtaer16060134

Menon, S., & Suresh, M. (2020). Synergizing education, research, campus operations, and community engagements towards sustainability in higher education: a literature review. International Journal of Sustainability in Higher Education, 21(5), 1015–1051. https://doi.org/10.1108/ijshe-03-2020-0089

Merschbrock, C., & Munkvold, B. E. (2015). Effective digital collaboration in the construction industry – A case study of BIM deployment in a hospital construction project. Computers in Industry, 73, 1–7. https://doi.org/10.1016/j.compind.2015.07.003

Musarat, M. A., Alaloul, W. S., & Liew, M. S. (2021). Inflation rate and labours' wages in construction projects: economic relation investigation. Engineering, Construction and Architectural Management, 29(6), 2461–2494. https://doi.org/10.1108/ecam-07-2020-0478

Musarat, M. A., Alaloul, W. S., & Liew, M. S. (2021a). Impact of inflation rate on construction projects budget: A review. Ain Shams Engineering Journal, 12(1), 407–414. https://doi.org/10.1016/j.asej.2020.04.009

Musarat, M. A., Alaloul, W. S., Liew, M. S., et al. (2020). Investigating the impact of inflation on building materials prices in construction industry. Journal of Building Engineering, 32, 101485. https://doi.org/10.1016/j.jobe.2020.101485

Myers, D. (2022). Construction Economics A new approach. Routledge. https://doi.org/10.1201/9781003287513

Nabi, M. A. & El-Adaway, I. H. (2022). Understanding Disputes In Modular Construction Projects: Key Common Causes And Their Associations. Journal Of Construction Engineering And Management, 148, 04021184. https://doi.org/10.1061/(ASCE)CO.1943-7862.0002208

Naz, F., Khan, A. Q., & Khan, M. Y. (2022). Impact Of Economic Determinants On The Scale Effect Of Cross Border Merger And Acquisition: A Comparison Between Developed And Emerging Economies. The Journal Of Asian Finance, Economics And Business, 9, 99-109.

Nazri, F. M. (editor). (2020). Proceedings of AICCE'19. Springer International Publishing. https://doi.org/10.1007/978-3-030-32816-0

Newman, C., Edwards, D., Martek, I., et al. (2020). Industry 4.0 deployment in the construction industry: a bibliometric literature review and UK-based case study. Smart and Sustainable Built Environment, 10(4), 557–580. https://doi.org/10.1108/sasbe-02-2020-0016

Ngeno, E. C., Mbuci, K. E., Necibi, M. C., et al. (2022). Sustainable re-utilization of waste materials as adsorbents for water and wastewater treatment in Africa: Recent studies, research gaps, and way forward for emerging economies. Environmental Advances, 9, 100282. https://doi.org/10.1016/j.envadv.2022.100282

Ofori, G. (editor). (2022). Research Companion to Construction Economics. Elagr online. https://doi.org/10.4337/9781839108235

Oke, A., Aghimien, D., Aigbavboa, C., et al. (2019). Drivers of Sustainable Construction Practices in the Zambian Construction Industry. Energy Procedia, 158, 3246–3252. https://doi.org/10.1016/j.egypro.2019.01.995

Oladinrin, T., Ogunsemi, D., & Aje, I. (2012). Role of Construction Sector in Economic Growth: Empirical Evidence from Nigeria. FUTY Journal of the Environment, 7(1). https://doi.org/10.4314/fje.v7i1.4

Padilla-Rivera, A., Russo-Garrido, S., & Merveille, N. (2020). Addressing the Social Aspects of a Circular Economy: A Systematic Literature Review. Sustainability, 12(19), 7912. https://doi.org/10.3390/su12197912

Pheng, L. S., & Hou, L. S. (2019). Construction Quality and the Economy. In: Management in the Built Environment. Springer Singapore. https://doi.org/10.1007/978-981-13-5847-0

Pradhan, P., Costa, L., Rybski, D., et al. (2017). A Systematic Study of Sustainable Development Goal (SDG) Interactions. Earth's Future, 5(11), 1169–1179. Portico. https://doi.org/10.1002/2017ef000632

Raihan, A., & Said, M. N. M. (2021). Cost–Benefit Analysis of Climate Change Mitigation Measures in the Forestry Sector of Peninsular Malaysia. Earth Systems and Environment, 6(2), 405–419. https://doi.org/10.1007/s41748-021-00241-6

Reifschneider, D., Wascher, W., & Wilcox, D. (2015). Aggregate Supply in the United States: Recent Developments and Implications for the Conduct of Monetary Policy. IMF Economic Review, 63(1), 71–109. https://doi.org/10.1057/imfer.2015.1

Sachs, J. D., Schmidt-Traub, G., Mazzucato, M., et al. (2019). Six Transformations to achieve the Sustainable Development Goals. Nature Sustainability, 2(9), 805–814. https://doi.org/10.1038/s41893-019-0352-9

Salah Alaloul, W., Musarat, M. A., Liew, M. S., et al. (2021). Influence Of Inflation Rate On Machinery Hire Rates In Construction Industry. Journal of Civil Engineering, Science and Technology, 12(1), 39–45. https://doi.org/10.33736/jcest.3342.2021

Salah Alaloul, W., Musarat, M. A., Mehmood, H., et al. (2021). Assessment Of Labour Productivity In Road Construction Projects Of Pakistan. Journal of Civil Engineering, Science and Technology, 12(1), 32–38. https://doi.org/10.33736/jcest.3340.2021

Sarvari, H., Chan, D. W. M., Alaeos, A. K. F., et al. (2021). Critical success factors for managing construction small and medium-sized enterprises in developing countries of Middle East: Evidence from Iranian construction enterprises. Journal of Building Engineering, 43, 103152. https://doi.org/10.1016/j.jobe.2021.103152

Saygili, M., Mert, I. E., & Tokdemir, O. B. (2022). A decentralized structure to reduce and resolve construction disputes in a hybrid blockchain network. Automation in Construction, 134, 104056. https://doi.org/10.1016/j.autcon.2021.104056

Scopus. (2023). Available online: Https://Www.Scopus.Com/Results/Results.Uri?Sort=Plf-F&Src=S&St1=%22circular+Economy%22+And+%22sustainable+Development%22&Sid=5df124aeba00955c36ea529f4248f536&Sot=B&Sdt=B&Sl=63&S=Title-Abs-Key%28%22circular+Economy%22+And+%22sustainable+Development%22%29&Origin=Searchbasic&Editsavesearch=&Yearfrom=Before+1960&Yearto=Present&Sessionsearchid=5df124aeba00955c36ea529f4248f536&Limit=10 (Accessed 14 July 2023).

Shiha, A., & Dorra, E. M. (2023). Resilience Index Framework for the Construction Industry in Developing Countries. Journal of Construction Engineering and Management, 149(4). https://doi.org/10.1061/jcemd4.coeng-12942

Shoar, S., Yiu, T. W., Payan, S., et al. (2021). Modeling cost overrun in building construction projects using the interpretive structural modeling approach: a developing country perspective. Engineering, Construction and Architectural Management, 30(2), 365–392. https://doi.org/10.1108/ecam-08-2021-0732

Sila, D. N. (2019). Willingness To Pay For Improved Conservation Of Water Catchment In Hai District, Tanzania. Mzumbe University.

Soewin, E., & Chinda, T. (2018). Factors affecting construction performance: exploratory factor analysis. IOP Conference Series: Earth and Environmental Science, 140, 012102. https://doi.org/10.1088/1755-1315/140/1/012102

Song, Y., Wang, X., Tan, Y., et al. (2017). Trends and Opportunities of BIM-GIS Integration in the Architecture, Engineering and Construction Industry: A Review from a Spatio-Temporal Statistical Perspective. ISPRS International Journal of Geo-Information, 6(12), 397. https://doi.org/10.3390/ijgi6120397

Sparrevik, M., de Boer, L., Michelsen, O., et al. (2021). Circular economy in the construction sector: advancing environmental performance through systemic and holistic thinking. Environment Systems and Decisions, 41(3), 392–400. https://doi.org/10.1007/s10669-021-09803-5

Stasiak-Betlejewska, R. & Potkány, M. 2015. Construction Costs Analysis And Its Importance To The Economy. Procedia Economics And Finance, 34, 35-42. https://doi.org/10.1016/S2212-5671(15)01598-1

Stetsenko, S. P., Tytok, V. V., Emelianova, O. M., et al. (2020). Management of Adaptation of Organizational and Economic Mechanisms of Construction to Increasing Impact of Digital Technologies on the National Economy. Journal of Reviews on Global Economics, 9, 149–164. https://doi.org/10.6000/1929-7092.2020.09.15

Suárez-Eiroa, B., Fernández, E., Méndez-Martínez, G., et al. (2019). Operational principles of circular economy for sustainable development: Linking theory and practice. Journal of Cleaner Production, 214, 952–961. https://doi.org/10.1016/j.jclepro.2018.12.271

Sultan, B., & Alaghbari, W. (2021). Construction industry sustainable development indicator for low-income developing countries: Yemen as a case study. International Journal of Construction Management, 23(6), 1053–1060. https://doi.org/10.1080/15623599.2021.1951429

Maqsoom, A., Prasittisopin, L., Musarat, M.A., Ullah, F. and Alqahtani, F.K., 2024. Construction Price Index Prediction through ARMA with Inflation Effect: Case of Thailand Construction Industry. Buildings, 14(5), p.1243.

Sun, C., Jiang, S., Skibniewski, M. J., et al. (2015). A literature review of the factors limiting the application of bim in the construction industry. Technological and Economic Development of Economy, 23(5), 764–779. https://doi.org/10.3846/20294913.2015.1087071

Tang, P., Huber, D., Akinci, B., et al. (2010). Automatic reconstruction of as-built building information models from laser-scanned point clouds: A review of related techniques. Automation in Construction, 19(7), 829–843. https://doi.org/10.1016/j.autcon.2010.06.007

Taofeeq, M. D., Adeleke, A. Q., & LEE, C.-K. (2020). Government policy as a key moderator to contractors' risk attitudes among Malaysian construction companies. Journal of Engineering, Design and Technology, 18(6), 1543–1569. https://doi.org/10.1108/jedt-08-2019-0192

Tompkins, E. L., Adger, W. N., Boyd, E., et al. (2010). Observed adaptation to climate change: UK evidence of transition to a well-adapting society. Global Environmental Change, 20(4), 627–635. https://doi.org/10.1016/j.gloenvcha.2010.05.001

Travush, V. I. (2018). Digital Technologies in Construction. Scientific Journal "academia. architecture and construction," 3, 100–117. https://doi.org/10.22337/2077-9038-2018-3-100-117

Van Tam, N., Quoc Toan, N., Tuan Hai, D., et al. (2021). Critical factors affecting construction labor productivity: A comparison between perceptions of project managers and contractors. Cogent Business & Management, 8(1). https://doi.org/10.1080/23311975.2020.1863303

Wijewansha, A. S., Tennakoon, G. A., Waidyasekara, K. G. A. S., et al. (2021). Implementation of circular economy principles during pre-construction stage: the case of Sri Lanka. Built Environment Project and Asset Management, 11(4), 750–766. https://doi.org/10.1108/bepam-04-2020-0072

Wong, J. M., Chan, A. P. & Chiang, Y. H. (2008). Modeling And Forecasting Construction Labor Demand: Multivariate Analysis. Journal Of Construction Engineering And Management, 134, 664-672. https://doi.org/10.1061/(ASCE)0733-9364(2008)134:9(664)

Wong, J., Wang, X., Li, H. & Chan, G. (2014). A Review Of Cloud-Based Bim Technology In The Construction Sector. Journal Of Information Technology In Construction, 19, 281-291.

Wu, Y., Zhu, Q., & Zhu, B. (2018). Comparisons of decoupling trends of global economic growth and energy consumption between developed and developing countries. Energy Policy, 116, 30–38. https://doi.org/10.1016/j.enpol.2018.01.047

Yu, S., Awasthi, A. K., Ma, W., et al. (2022). In support of circular economy to evaluate the effects of policies of construction and demolition waste management in three key cities in Yangtze River Delta. Sustainable Chemistry and Pharmacy, 26, 100625. https://doi.org/10.1016/j.scp.2022.100625

Yu, Y., Junjan, V., Yazan, D. M., et al. (2022). A systematic literature review on Circular Economy implementation in the construction industry: a policy-making perspective. Resources, Conservation and Recycling, 183, 106359. https://doi.org/10.1016/j.resconrec.2022.106359

Yusof, Y., & Kalirajan, K. (2020). Variations in economic growth across states in Malaysia: an exploratory analysis. Journal of Economic Studies, 48(3), 699–719. https://doi.org/10.1108/jes-06-2019-0279

Zarfl, C., Lumsdon, A. E., Berlekamp, J., et al. (2014). A global boom in hydropower dam construction. Aquatic Sciences, 77(1), 161–170. https://doi.org/10.1007/s00027-014-0377-0