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DECISION-MAKING PROCESS AND INFRASTRUCTURE DEVELOPMENT EFFICIENCY IN JORDAN

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Abstract:

Sustainability projects in infrastructure play a crucial role in driving the economy towards sustainable development. Traditional construction projects often consume a lot of natural resources, cause environmental pollution, and lead to financial waste. In contrast, sustainability projects help conserve resources, enhance efficiency, and promote innovation. This encourages a balance between current needs and the ability to meet future generations' needs. This study aimed to investigate the decision-making process and infrastructure development efficiency in Jordan. Using a customized questionnaire distributed to a number of contractors and consultants in Jordan (N=308), the study found that six out of twelve standards are applied in Jordan, which are: SuRe® (Standard for Sustainable and Resilient Infrastructure), ENVISION®, CEEQUAL (Civil Engineering Environmental Quality Assessment), IS Rating, IS Operation, and IS International Scheme, IFC Performance Standards, Equator Principles, GRESB Infrastructure Assessment. The results also showed varying levels of integration among these standards, with the standard ENVISION being the most integrated with other standards. The study recommended: Develop clear and supportive policy and regulatory frameworks and enabling environments to ensure that sustainability and resilience become integral parts of planning and investment criteria, in addition provide ongoing training and education for personnel involved in infrastructure projects on economic, social, and environmental sustainability issues.

Keywords: Decision-making process, infrastructure development, efficiency, Jordan

1. INTRODUCTION AND THEORETICAL LITERATURE

The decision-making process in construction projects is not a spontaneous occurrence but is preceded by a series of logical steps that precede the actual decision and form one of its inputs before implementation in reality. (Manipura et al., 2013; Beconytė et al., 2007; Zainal et al., 2017) highlighted the importance of the decision-making process, emphasizing that it involves a dedicated process to achieve project objectives. This involves searching for all available options or solutions, gathering and analyzing them, and then evaluating them in preparation for determining the option deemed most suitable and optimal by the decision-maker for the project.

Thus, the decisions made by stakeholders, including owners, contractors, and consultants, in these areas have a significant impact on project performance (Chatzi et al., 2017; Hansen et al., 2021). In fact, delays in making or executing decisions are considered one of the critical factors leading to the failure of construction projects, and making the wrong decision directly leads to increased project costs. According to (Hellenkamp, 2016; Borri et al., 2022), every decision made throughout the project lifecycle can have a significant impact on its outcomes. Therefore, it is essential for project managers and team members to participate in making informed decisions. Informed decision-making involves gathering relevant information, analyzing it, considering different perspectives, and weighing the pros and cons of alternative options before arriving at the desired outcome. It is crucial for all stakeholders, such as consultants, contractors, and clients, to complete the construction project on time, at a reasonable cost, and within the available resources (Lovell et al., 2021; Kordana and Słyś, 2020; Makarova et al., 2020).

Moreover, the decision-making process begins with a deep understanding of the project's details and lifecycle. This involves taking notes or following an approach of

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comprehensive and thorough observation and monitoring of the project. This, in turn, enables stakeholders to capture critical details, observations, and insights necessary for making sound decisions. In other words, the decision-making process is considered a human activity that must be based on complete awareness and a true study of the project lifecycle from the starting point to the delivery point (Iradukunda et al., 2023; Harris-Lovett et al., 2019). However, it is not always about making decisions by choosing the best alternative in reality. Often, it involves prioritizing all alternatives to allocate resources or combining individual preferences' strengths to form a collective preference (Staniuk et al., 2022; Faizal et al., 2008; Primc et al., 2023).

Thus, the decision-making process in infrastructure projects specifically is subject to significant risk and challenge (Zainal et al., 2017). Decisions made in the infrastructure process typically take a long time because these projects are generally large-scale, require substantial financial resources, and have long-term, irreversible consequences. Consequently, the decision-making process in infrastructure-related projects involves a large number of stakeholders, whose stakes in such projects are usually very high (Staniuk et al., 2022; Faizal et al., 2008; Primc et al., 2023).

In this case, the decision-making process is conducted based on specific circumstances and information, or in a state of uncertainty due to the presence of several possibilities without any information about their likelihood of occurring (Beconytė et al., 2007). Often, the implications of these decisions are not known until a later stage of the project. What complicates matters further is that these decisions are made by individuals whose authorities and responsibilities may vary from one project to another, not to mention the differing attitudes toward assessing the risks the project may face (Faizal et al., 2008).

Therefore, many decision-makers and stakeholders cannot afford an uncontrolled or subjectively based decision-making process due to its negative impact on the objectives and execution of infrastructure projects. Hence, developing a logical strategy for the decision-making process throughout the project requires identifying the stages of this process, supporting skills, and investing in tools that enhance the efficiency of these project lifecycle stages (Onyshchenko et al., 2020). It cannot be overlooked that any project, regardless of its size, relies on the three pillars of project management: scope, time, and performance. Decisions made in these areas have a significant impact on project performance (Staniuk et al., 2022).

Thus, the managerial theory posits that decision-making is purely a managerial function and that it permeates the entire organizational activity process. Therefore, the hypothesis that decision-making is the heart of management has been highlighted, suggesting that decision-making and planning are integrated into a single function (Primc et al., 2023).

According to (Phung and Dao, 2024), empirical studies on management systems in large infrastructure projects provide a good framework for understanding the societal governance of infrastructure development projects. Firstly, infrastructure projects are produced by multiple parties through a complex set of transactions. Secondly, the importance of national security, national stability, and economic growth in the development process has made infrastructure development politically and economically prominent (Manipura et al., 2013).

Despite the importance of decision-making in developing infrastructure projects in any country, we find that governments have neglected some problems arising from not making informed decisions. "Decision-making" and "planning" for public sector infrastructure projects have been among the prominent challenges facing the economies of developing countries. Infrastructure projects in developing countries are more susceptible to political uncertainty, economic stagnation, and natural disasters (Beconytė et al., 2007; Zainal et al., 2017).

Since then, poverty and inefficient governance structures have increased in Pakistan. Due to the poor political climate, government-sponsored projects have declined over the past few years (Lovell et al., 2021). To meet infrastructure needs cost-effectively, government agencies and stakeholders in the construction industry are exploring more economically viable ways to provide infrastructure (Hansen et al., 2021).

Thus, infrastructure projects play a pivotal role in the growth of economies in many developing countries and also improve the living standards of individuals. Well-developed infrastructure projects, including roads, transportation, bridges, and organized urban design, indirectly facilitate communication and enhance the agricultural and industrial production of the country (Chatzi et al., 2017). Non-residential and commercial structures and facilities play a key role in promoting tourism, recreational, commercial, and cultural activities in the region (Sachit et al., 2024). As these projects grow and are inherently complex, consuming a significant amount of construction capital and financial and human resources, the aspects of management, planning, and decision-making in infrastructure projects

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must be handled with great care and meticulous planning (Harris-Lovett et al., 2019).

From the perspective of the Hashemite Kingdom of Jordan on infrastructure development, Jordan has made significant progress in infrastructure development since its independence in 1946. It now has adequate facilities in telecommunications, energy, electricity, water, and transportation infrastructure. Jordan also boasts a very good transportation infrastructure, with one seaport (Aqaba) on the Red Sea, two railway companies, and a road network totaling 7,200 km.

Thus, construction projects are considered an integral part of infrastructure development in Jordan, significantly boosting its economy. This sector constituted between 5% and 8.3% of the country's GDP during the period from 1998 to 2024. There has been increasing collaboration to develop the construction sector in Jordan with international partners. Typically, international companies provide specialized technical expertise, while local companies contribute their technical and engineering services. The construction sector in Jordan faces many challenges that limit its development. Being a protected sector has reduced competition in the local market, allowing a certain degree of non-contribution from many local companies. Additionally, access to financing and limited funds allocated for research and development delay the development of sustainable construction in Jordan. Other important factors also affect the construction industry, notably the lack of specialized skills in many areas of work, such as the development of large-scale projects, the disregard for skilled Jordanian workers, and reliance on foreign labor, alongside the permanent migration of highly skilled engineers and professionals to other countries.

Given these challenges, this research explores the decision-making process in the construction industry, particularly concerning infrastructure development in the Hashemite Kingdom of Jordan, which has been overlooked compared to other industries. The research found a significant gap in the study related to the decision-making process in the public sector infrastructure development program in Jordan. This research will provide an overview of the decision-making process in the construction sector in Jordan and a potential direction for successful national planning and government policy formulation for Jordan. Therefore, this research offers a framework to guide the decision-making process and enhance the efficiency of infrastructure development in public sector projects in the central region of Jordan.

2. METHODOLOGY:

A quantitative approach was followed. The research included a systematic and organized method for collecting, analyzing and interpreting data related to decision-making processes and the efficiency of infrastructure development in Jordan. This is to identify the main factors influencing decision-making and evaluate their impact on project outcomes from the perspective of stakeholders, including project owners and contractors.

3. SAMPLING AND POPULATION:

The study sample was randomly selected from a homogeneous population of consultants and contractors who held engineering membership from the Jordanian Engineers Association. The number of companies registered in the Jordanian Building Contractors Syndicate for the year 2024 was (226) companies, while the number of offices registered in the Jordanian Engineers Syndicate was (1,321) engineering offices. That is, the study population amounted to a total of (1547) consulting and contracting companies. The sample size that represents the target population was determined through an equation widely used by researchers. The Sekaran (2003) equation was used, which states ($S_{\underline{X}} = \frac{S}{\sqrt{n}} \times \sqrt{\frac{N-n}{N-1}}$), and accordingly, the sample size reached (308) companies. The following figure shows the size of the study population:

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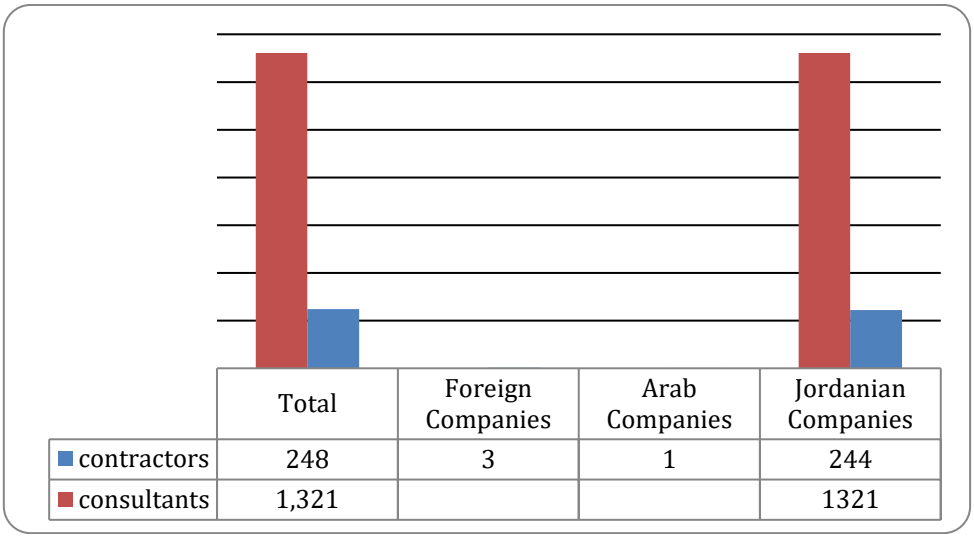

	Total	Foreign Companies	Arab Companies	Jordanian Companies
contractors	248	3	1	244
consultants	1,321			1321

Figure 1: Number of companies registered in the Jordanian Construction Contractors Syndicate in 2024
Source: Jordanian Construction Contractors Association (2024) *Number of companies registered in the Jordanian Construction Contractors Association for the year 2024*. Available at: https://www.jcca.org.jo/SiteContent.aspx?id=10146 (Accessed: 14 July 2024).

4. QUESTIONNAIRE DESIGN

Questionnaire design guidelines are obtained from two main data sources and then refined with the help of subject matter experts: first: literature review and second: official reports and documents published on official Jordanian websites. The article was studied through search terms such as "global standards for infrastructure development," "decision-making process in construction project management," "global standards adopted in infrastructure development," and "management sciences and business administration." After screening, the articles were selected according to their relevance. By topic, articles were selected that fell within specific criteria and included the following: First: articles and books published in the period from 2019 to 2024 and secondly, articles, books and reports that focused on administrative sciences, especially those related to the decision-making process, and finally, that focused on infrastructure projects.

Through reviewing these studies, 12 infrastructure development standards were included for consideration. These twelve standards, which were identified after reviewing the literature, were discussed with relevant experts in the construction industry so that it could be confirmed that they are actually applied in the construction sector in the Hashemite Kingdom of Jordan. Discussions were held via the Zoom program and discussions were held with the relevant authorities, such as the Jordanian Ministry of Works, the Jordanian Building Contractors Association, and the Jordanian Engineers Association, who are directly involved in the building and construction process in Jordan, to determine the international standards approved in Jordan to prepare the final questionnaire.

The international standards adopted in Jordan, which were selected after the pilot survey, were revealed in detail and then re-examined. The researchers first conducted a pilot test on the questionnaire, which consisted of 12 international standards. Each participant has 10-20 years of experience in the construction industry in Jordan and abroad. The questionnaire was modified according to the comments of these specialist experts to make it suitable for infrastructure construction in the country. The researchers issued a cover letter and survey instructions to participants to reassure them that their responses would be anonymous. The final questionnaire requested information on participants covering their qualifications, function, practical experience in building construction and category whether they represented clients, consultants or contractors. Finally, the questionnaire was prepared on a 5-point Likert scale (5=very important, 4=very important, 3=somewhat important, 2=slightly important, 1=not important).

5. DATA COLLECTION

Data were collected by distributing 308 paper questionnaires that were delivered on paper to consultants, individual contractors, and companies that concluded contracts with clients to implement one or more infrastructure projects exclusively in the Hashemite Kingdom of Jordan. Participants included 208 consultants and 117 contractors. After examining the questionnaires, it was found that there was one

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questionnaire that was not suitable for analysis, so it was excluded, so the sample size became 207, suitable for analysis**.**

6. ANALYSIS AND RESULTS

Researchers have identified the most important criteria that help in developing infrastructure that can influence decision-making. The international standards adopted in Jordan that can influence decision-making were identified in two stages. Initially, it was a list of all international standards that contribute to infrastructure development, and then this number was reduced according to the pilot sample, which reported that there were only 6 standards applied out of 12 approved standards for infrastructure development (The Sustainable Infrastructure Alliance (SIA), 2020).

Table 1. Accredited international standards influencing sustainable decision making based on literature review

1.SuRe® (Standard for Sustainable and Resilient Infrastructure)	2.CEEQUAL (Civil Engineering Environmental Quality Assessment)	5. GRESB Infrastructure Assessment	7. TCFD (Task Force on ClimateRelated Financial Disclosures)	9. GHG Protocol Accounting and Reporting Standard	11. UN PRI (Principles for Responsible Investment)
3.ENVISION®	4.IFC Performance Standards, Equator Principles	6. SASB (Sustainability Accounting Standards Board Infrastructure Team)	8. IS Rating, IS Operation, and IS International Scheme	10. CDC ESG Toolkit for Fund managers	12. UN SDGs

The results of this table identify the international standards that influence the process of sustainable decision-making based on a review of theoretical literature. These standards focus on the long-term sustainability of infrastructure projects, emphasizing economic, environmental, and social dimensions. They also involve disclosing information on climate-related opportunities and risks to enable investors to make decisions based on comprehensive information about climate change. Additionally, they determine the extent to which these projects comply with social and environmental standards and provide the required reporting.

Table 2: International standards included in the shortlist adopted in Jordan.

1. SuRe® (Standard for Sustainable and Resilient Infrastructure)	3. CEEQUAL (Civil Engineering Environmental Quality Assessment)	5. IFC Performance Standards, Equator Principles
2. ENVISION®	4. IS Rating, IS Operation, and IS International Scheme	6. GRESB Infrastructure Assessment

From Table 2, it is clear that there is a limited scope of standards used in Jordan. This limitation is due to the significant human and financial resources, as well as advanced expertise required to implement all twelve standards. Additionally, some standards may not align with local laws and regulations or the local environment. Some standards also require advanced training, and the unused standards may be more complex than those that are applied.

Table 3:Details of Questionnaires and Responses.

Professionals	Distributed questionnaires	Recovered questionnaires	% Rate of responses
Contractor	117	116	0.37786
Consultant	191	191	0.62214
Total	308	307	100

The results from the previous table show that a total of (308) questionnaires were distributed, with (307) questionnaires returned, resulting in a response rate of approximately (100%). The number of questionnaires distributed to consultant was higher than those distributed to contractors, and both groups responded to the distributed questionnaires extensively.

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Table 4: Distribution of sample members according to demographic variables (n=307)

Variable	G	N	%
Profession	Contractor	131	42.7
	Consultant	176	57.3
Educational level	Technical degrees (diplomas)	38	12.4
	Bachelor's	232	75.6
	Postgraduate	37	12.1
Experience in construction projects	Less than 5 years	18	5.9
	From 5 to 10 years	91	29.6
	From 11 years to 20 years	156	50.8
	From 21 years and over	42	13.7
Geographical area	Northern Jordan	109	35.5
	South Jordan	4	1.3
	Central Jordan	194	63.2

The results from Table 4. indicate that the majority of the study sample consisted of consultants, accounting for 57%, while contractors represented 42.7%. Additionally, the majority of the sample had a bachelor's degree, with 75.6%, followed by those with technical certifications at 12.4%, and finally, those with postgraduate studies at 1.2%. Out of 307 participants, those with experience ranging between 11 to 20 years constituted the largest percentage at 50.8%, while the group with less than 5 years of experience represented the smallest percentage at 5.9%. Additionally, the largest percentage of participants were from Central Jordan, accounting for 63.2%, while those from the South represented the smallest percentage at 1.3%.

Table 5: Statistical coefficients for the study variables

Name	No.	Type	Missings	Mean	Median	Scale min	Scale max	Observed min	Observed max	Standard deviation	Excess kurtosis	Skewness
SuRe1	5	ORD	0	4.443	5.000	2.000	5.000	2.000	5.000	0.640	-0.046	-0.797
SuRe2	6	ORD	0	4.205	4.000	1.000	5.000	1.000	5.000	0.819	1.611	-1.110
SuRe3	7	ORD	0	4.508	5.000	1.000	5.000	1.000	5.000	0.776	6.514	-2.257
SuRe4	8	ORD	0	4.195	4.000	2.000	5.000	2.000	5.000	0.808	0.570	-0.930
SuRe5	9	ORD	0	4.046	4.000	1.000	5.000	1.000	5.000	1.001	0.198	-0.876
SuRe6	10	ORD	0	4.349	4.000	2.000	5.000	2.000	5.000	0.670	-0.394	-0.610
ENVISION1	11	ORD	0	4.417	5.000	2.000	5.000	2.000	5.000	0.763	1.613	-1.355
ENVISION2	12	ORD	0	4.560	5.000	1.000	5.000	1.000	5.000	0.624	4.019	-1.602
ENVISION3	13	ORD	0	4.362	4.000	1.000	5.000	1.000	5.000	0.759	4.810	-1.702
ENVISION4	14	ORD	0	4.384	4.000	1.000	5.000	1.000	5.000	0.723	4.500	-1.562
ENVISION5	15	ORD	0	4.342	4.000	1.000	5.000	1.000	5.000	0.720	1.970	-1.093

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ENVISION6	16	ORD	0	4.316	4.000	1.000	5.000	1.000	5.000	0.662	1.361	-0.792
CEEQUAL1	17	ORD	0	4.283	4.000	1.000	5.000	1.000	5.000	0.762	1.949	-1.150
CEEQUAL2	18	ORD	0	4.274	4.000	1.000	5.000	1.000	5.000	0.706	0.633	-0.725
CEEQUAL3	19	ORD	0	4.293	4.000	1.000	5.000	1.000	5.000	0.822	1.727	-1.226
CEEQUAL4	20	ORD	0	4.264	4.000	1.000	5.000	1.000	5.000	0.773	0.068	-0.750
CEEQUAL5	21	ORD	0	4.381	4.000	1.000	5.000	1.000	5.000	0.695	1.124	-0.971
CEEQUAL6	22	ORD	0	4.270	4.000	1.000	5.000	1.000	5.000	0.780	1.568	-1.094
ISRating1	23	ORD	0	4.280	4.000	1.000	5.000	1.000	5.000	0.761	1.213	-0.967
ISRating2	24	ORD	0	4.306	4.000	1.000	5.000	1.000	5.000	0.777	3.855	-1.515
ISRating3	25	ORD	0	4.303	4.000	2.000	5.000	2.000	5.000	0.710	-0.402	-0.624
ISRating4	26	ORD	0	4.293	4.000	1.000	5.000	1.000	5.000	0.814	3.091	-1.459
ISRating5	27	ORD	0	4.300	4.000	1.000	5.000	1.000	5.000	0.767	2.314	-1.268
IFC1	28	ORD	0	4.254	4.000	1.000	5.000	1.000	5.000	0.870	2.699	-1.473
IFC2	29	ORD	0	4.427	5.000	2.000	5.000	2.000	5.000	0.648	0.293	-0.842
IFC3	30	ORD	0	4.316	4.000	1.000	5.000	1.000	5.000	0.741	1.228	-1.018
IFC4	31	ORD	0	4.453	5.000	1.000	5.000	1.000	5.000	0.770	3.717	-1.712
IFC5	32	ORD	0	4.270	4.000	2.000	5.000	2.000	5.000	0.758	0.554	-0.903
GRESB1	33	ORD	0	4.394	5.000	1.000	5.000	1.000	5.000	0.720	2.498	-1.280
GRESB2	34	ORD	0	4.277	4.000	2.000	5.000	2.000	5.000	0.725	0.128	-0.735
GRESB3	35	ORD	0	4.485	5.000	1.000	5.000	1.000	5.000	0.776	5.821	-2.098
GRESB4	36	ORD	0	4.261	4.000	2.000	5.000	2.000	5.000	0.764	0.452	-0.877
GRESB5	37	ORD	0	4.290	4.000	2.000	5.000	2.000	5.000	0.716	0.019	-0.708

From Table 5, it is evident that there is significant agreement among participants regarding the use of international standards influencing sustainable decision-making. The mean values ranged between 4.046 and 4.56, all reflecting a high level of agreement. Upon reviewing the mean values, it is clear that the "ENVISION®" standard received the highest mean score, followed by the "GRESB Infrastructure Assessment" standard, while the "SuRe® (Standard for Sustainable and Resilient Infrastructure)" standard ranked last. The table results indicate that participants largely agree on the importance of international standards in sustainable decision-making, with a clear preference for the ENVISION® standard as the most influential or relevant in this context.

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Table 6: Testing the correlations between decision-making process variables and the efficiency of infrastructure development in Jordan

Name	SuRe1	SuRe2	SuRe3	SuRe4	SuRe5	SuRe6	ENVISION1	ENVISION2	ENVISION3	ENVISION4	ENVISION5	ENVISION6	CEEQUAL1	CEEQUAL2	CEEQUAL3	CEEQUAL4	CEEQUAL5	CEEQUAL6	ISRating1	ISRating2	ISRating3	ISRating4	ISRating5	IFC1	IFC2	IFC3	IFC4	IFC5	GRESB1	GRESB2	GRESB3	GRESB4	GRESB5
SuRe1	1.000																																
SuRe2	0.454	1.000																															
SuRe3	0.406	0.410	1.000																														
SuRe4	0.330	0.323	0.112	1.000																													
SuRe5	0.136	0.148	0.394	0.158	1.000																												
SuRe6	0.309	0.261	0.267	0.392	0.180	1.000																											
ENVISION1	0.302	0.416	0.556	0.190	0.291	0.404	1.000																										

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ENVISION2	0.259	0.514	0.428	0.242	0.183	0.304	0.556	1.000																								
ENVISION3	0.280	0.420	0.573	0.251	0.386	0.310	0.567	0.514	1.000																							
ENVISION4	0.272	0.312	0.331	0.122	0.385	0.234	0.264	0.237	0.477	1.000																						
ENVISION5	0.307	0.384	0.383	0.210	0.263	0.368	0.310	0.385	0.501	0.279	1.000																					
ENVISION6	0.370	0.409	0.423	0.244	0.288	0.465	0.346	0.455	0.603	0.359	0.799	1.000																				
CEEQUAL1	0.263	0.392	0.269	0.286	0.231	0.425	0.251	0.365	0.487	0.281	0.773	0.753	1.000																			

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CEEQUAL2	0.316	0.331	0.299	0.318	0.185	0.522	0.399	0.354	0.429	0.253	0.668	0.777	0.703	1.000																		
CEEQUAL3	0.242	0.462	0.420	0.257	0.257	0.471	0.319	0.448	0.493	0.342	0.695	0.728	0.689	0.687	1.000																	
CEEQUAL4	0.369	0.259	0.341	0.272	0.258	0.489	0.432	0.389	0.392	0.273	0.487	0.569	0.592	0.649	0.513	1.000																
CEEQUAL5	0.404	0.372	0.378	0.244	0.251	0.526	0.431	0.379	0.578	0.305	0.612	0.638	0.632	0.617	0.705	0.673	1.000															
CEEQUAL6	0.230	0.438	0.252	0.247	0.185	0.331	0.320	0.405	0.424	0.249	0.567	0.554	0.693	0.588	0.567	0.606	0.543	1.000														
ISRating1	0.407	0.373	0.349	0.319	0.253	0.435	0.332	0.396	0.501	0.307	0.598	0.665	0.750	0.748	0.655	0.693	0.678	0.668	1.000													

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ISRating2	0.330	0.321	0.509	0.164	0.376	0.315	0.428	0.412	0.613	0.335	0.652	0.712	0.602	0.542	0.650	0.614	0.713	0.568	0.654	1.000										
ISRating3	0.414	0.397	0.430	0.238	0.329	0.559	0.398	0.389	0.510	0.293	0.638	0.711	0.570	0.627	0.701	0.673	0.822	0.564	0.693	0.700	1.000									
ISRating4	0.295	0.266	0.455	0.190	0.251	0.338	0.280	0.311	0.529	0.317	0.573	0.632	0.664	0.580	0.543	0.612	0.591	0.578	0.677	0.646	0.607	1.000								
ISRating5	0.307	0.353	0.220	0.247	0.161	0.532	0.277	0.323	0.351	0.274	0.629	0.603	0.691	0.589	0.620	0.570	0.757	0.617	0.660	0.552	0.755	0.605	1.000							
IFC1	0.207	0.261	0.253	0.059	0.178	0.284	0.317	0.290	0.335	0.249	0.428	0.512	0.511	0.555	0.470	0.535	0.486	0.610	0.591	0.507	0.503	0.548	0.555	1.000						
IFC2	-0.008	0.056	-0.036	0.021	0.010	0.055	0.154	0.174	0.064	-0.058	0.001	0.035	0.039	0.008	-0.002	0.094	0.080	0.113	0.028	0.012	0.052	-0.033	0.110	0.091	1.000					
IFC3	0.035	0.065	-0.138	-0.060	0.038	-0.032	0.032	-0.017	-0.029	0.071	0.023	0.036	0.032	0.003	0.014	0.019	0.082	-0.001	0.011	0.058	0.072	-0.100	0.103	0.128	0.262	1.000				

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IFC4	0.075	0.008	-0.074	0.020	0.024	-0.022	0.000	0.055	-0.007	-0.002	0.003	-0.006	-0.013	-0.036	0.053	0.013	0.073	-0.057	-0.016	0.024	0.023	-0.077	0.074	0.042	0.265	0.435	1.000					
IFC5	0.002	0.037	-0.095	0.095	0.044	0.007	0.025	0.031	-0.011	-0.005	0.105	0.063	0.093	0.057	0.066	0.012	0.064	0.080	0.032	0.042	0.072	0.014	0.169	0.093	0.534	0.242	0.092	1.000				
GRESB1	-0.011	0.100	-0.061	0.064	-0.029	-0.069	0.021	0.074	0.055	0.009	0.034	0.056	0.031	0.116	0.025	0.035	0.001	0.002	0.059	0.064	0.068	0.119	0.007	0.025	0.526	0.267	0.430	0.306	1.000			
GRESB2	0.052	0.118	-0.117	0.024	0.041	-0.078	0.033	0.010	0.019	0.095	0.049	0.028	0.064	0.011	0.050	0.032	0.081	0.046	0.072	0.081	0.096	-0.049	0.120	0.111	0.275	0.692	0.335	0.255	0.377	1.000		
GRESB3	0.072	0.023	-0.063	0.057	0.058	-0.025	-0.001	0.044	0.034	0.010	0.041	0.006	0.010	-0.022	0.048	0.020	0.074	-0.012	0.007	0.034	0.058	-0.050	0.090	0.039	0.255	0.221	0.701	0.093	0.544	0.323	1.000	
GRESB4	0.030	0.034	-0.086	0.113	0.065	0.033	-0.002	0.040	-0.056	0.025	0.093	0.030	0.075	0.007	0.050	-0.023	0.046	-0.020	-0.030	-0.014	0.041	-0.008	0.111	0.103	0.216	0.234	0.137	0.682	0.275	0.411	0.105	1.000
GRESB5	-0.039	0.037	0.128	-0.030	0.127	0.013	0.041	0.089	0.101	-0.020	0.054	-0.001	0.058	-0.022	0.099	-0.050	0.027	-0.000	-0.018	0.010	-0.019	0.033	-0.022	-0.035	-0.070	-0.087	0.069	-0.156	-0.000	-0.035	-0.019	-0.079	1.000

The results from the previous table revealed the correlations between the international standards used in Jordan in the context of sustainability decision-making. The results showed significant correlations between "ENVISION" (ENVISION1 to ENVISION6) and "CEEQUAL" (CEEQUAL1 to CEEQUAL6). Specifically, the correlation between "ENVISION1" and "CEEQUAL1" was high, at 0.773, indicating a strong relationship between these two standards. Additionally, the correlation between "IS Rating" (ISRating1 to ISRating5) and "CEEQUAL" was also strong, with correlation values exceeding 0.6 in several cases. The results also showed strong to moderate correlations between the "SuRe" standards (SuRe1 to SuRe6) and the "ENVISION" standards (ENVISION1 to ENVISION6). Notably, the correlation between SuRe3 and ENVISION3 was 0.556, indicating a significant degree of integration between the two standards concerning sustainability decisions. On the other hand, the correlation matrix revealed some low or negligible correlations. Specifically, the indicators

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for "IFC" (IFC1 to IFC5) and "GRESB" (GRESB1 to GRESB5) showed weak or negligible correlations with most other indicators. Notably, the correlation coefficient between "IFC1" and "SuRe1" was 0.207, which is relatively low. Overall, it appears that standards such as "SuRe" and "IFC" are the least correlated with other standards when compared to "ENVISION" and "CEEQUAL." This suggests that "SuRe" and "IFC" may be less integrated with other sustainability standards used.

CONCLUSION

Sustainable development has increasingly become at the forefront of the global strategic agenda and achieving it requires joint efforts from economic actors worldwide, including countries, financial organizations, and companies. At the same time, infrastructure plays a crucial role in achieving sustainable development and is a prerequisite for stable economic growth. Its sustainability and adaptability are key factors in the 21st century. The global market for sustainable infrastructure is actively evolving, with new green financing tools being developed for projects (such as green, social, sustainable, blue, and transition bonds); international initiatives are being developed to stimulate sustainable infrastructure and quality assessment standards. Simultaneously, investors are increasingly considering environmental, social, and governance (ESG) factors in their decision-making. Additionally, initiatives are being launched to assess the sustainability of infrastructure projects, adhering to international best practices in sustainable development. All of this creates conditions for further consideration of sustainable development principles and infrastructure that focus on achieving positive long-term economic impacts, as well as addressing social and environmental challenges in the 21st century.

RECOMMENDATIONS

Based on the results of the study, the researchers recommend the following:

1. Develop clear and supportive policy and regulatory frameworks and enabling environments to ensure that sustainability and resilience become integral parts of planning and investment criteria, both for public expenditure and as signals for private investment.
2. Offer training and awareness programs to familiarize stakeholders with global standards used in the field of infrastructure sustainability and methods for applying them within the context of infrastructure projects in Jordan.
3. Incorporate sustainability criteria into procurement processes and investment plans, enhance transparency and anti-corruption efforts, and improve service delivery, as well as time and cost management.
4. Provide ongoing training and education for personnel involved in infrastructure projects on economic, social, and environmental sustainability issues, as well as the latest technologies and innovations, to enhance their skills and knowledge in this field.

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