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Analyzing the impact of organizational culture on social sustainability: a perspective of the construction industry

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Abstract
This study aims to analyze how organizational culture can affect social sustainability indicators. Through an extensive review of the literature with a qualitative systems-based approach, multiple factors of organizational culture and social sustainability indicators are identified. Moreover, linkages and interdependencies among them in a complex system are generated from the data collected from 97 construction industry professionals. In total, five causal loop diagrams (CLDs) are developed in which the effect of organizational culture on social sustainability in the construction industry is illustrated. The result of a systematic analysis of content indicates the most impacting factors that incorporate the literature and industry scores. Among these factors, goal setting and teamwork orientation, respecting and caring for communities and impact assessment are most significant with scores of 0.124 and 0.126. Furthermore, to map the effect of organizational culture on social sustainability, the factors in CLD are prioritized because of their strength and speed of influence in the system. The results in CLDs highlight that respecting and caring for communities, impact assessment, awareness of social sustainability, and opportunity for skills development are the most crucial and mutually affecting factors among different loops impacted by organizational culture. Moreover, the identified CLDs indicate robust loops and resonant mechanisms which give information on different factors within the complex system and can assist decision-makers and top management to make robust strategies and policies for assessing the impact of organizational culture on social sustainability through their underlying interdependencies.

Keywords Organizational culture · Social sustainability · Sustainability · Causal loop diagram · System dynamics

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1 Introduction

The construction sector has a distinguished role in socio-economic growth (Marusheva, 2019). Due to the high link between the construction industry and other related industries, the growth of the construction industry heralds the overall growth of global economic activity. The construction sector accounts for more than 10% of the world's GDP and employs about 7% of the world's workforce. Moreover, the global construction market reached a value of nearly 10.80 trillion US dollars in CY17, and 12.744 trillion US dollars in CY19, whereas it is expected that this amount will reach 15.482 trillion dollars in CY23 because of the rapidly rising global population increases the demand for infrastructure projects (PACRA, 2021). Further, construction contributes to economic development by pursuing specific key development objectives, including production, manufacturing, job creation, revenue generation, and redistribution (Erol & Unal, 2015). There is no aspect of human life in civilizations where the construction does not have a profound effect not only on physical places but also on hearts, uniting people in their social, cultural, political, recreational, and economic aspirations. Therefore, construction plays an important role in fulfilling the physical and social needs of communities, such as shelter, infrastructure, and consumer goods manufacturing (Mavi et al., 2021). With the quick shift of the construction industry towards globalization, substantial recognition and consideration have been given to the examination of organizations and their underlying cultures (Navimipour et al., 2018). The key motivation for increasing the importance of organizational culture can be signified by the internationalization of the construction sector (Maqsoom et al., 2020), and its fragment-oriented features (Saunders et al., 2017). It is a widely accepted fact that construction organizations have encountered diverse issues due to conflicts, disputes, miscommunications, and dissimilarities in conducting their businesses, which are directly interconnected with their cultural indicators (Nguyen & Watanabe, 2017).

Moreover, social sustainability-related challenges have gained recognition from both industry professionals and academicians in the context of construction organizations (Maqsoom et al., 2021; McKenzie, 2004) described social sustainability as a life-improving approach and process for the communities. Similarly, Goel et al. (2020) are of the view that every person in a community ought to have a comfortable and decent quality of life, i.e. equity, recognition, self-security, benefits, health, and reach for daily necessities. In a similar view, Gates and Lee (2005) argue that social sustainability comprises three elements: necessities, individual or human capability, and social or community capability. And the significance of each element during construction projects should not be ignored. Plessis (2002) and Talukhaba et al. (2005) concluded from their study that in the modern era of projects in the construction sector, socio-economic issues other than environmental problems should also be concentrated by construction companies in the context of developing nations. Thus, social necessities and community perspectives should be incorporated into the decision-making procedures by organizations regarding the development of construction projects (Misopoulos et al., 2019).

Over the last decade, social sustainability has gained greater legitimacy in the significant changes in both private and public awareness (Reilly & Weirup, 2012) regarding different levels of corporate social responsibility, not only financial but also at social and human levels. As a result of this increased awareness, the attention of leaders, professionals, and scientists is growing towards a global debate on how to redesign current organizational cultures to provide more with less spending, amidst extreme changes in economic and social priorities (Mohrman & Shani, 2011). Because of this, the organizations need to find ways

to create shared value (Porter and Kramer, 2011), such as organizations need to meet their productive objectives and goals which should be socially and environmentally friendly so that diverse stakeholders also find opportunities that must be recognized (Bamgbade et al., 2017). Even though sometimes still denied or ignored in its process and perplexity, the challenge of organizations for adopting social sustainability remains an important topic (Konrad et al., 2006). Considering the importance of social sustainability in construction organizations, social sustainability attributes need to be outlined as well (Fatourehchi & Zarghami, 2020). This is opposed to the fact that the coverage in published literature is small that investigates the impact of organizational culture factors on social sustainability in the construction sector (Zuo et al., 2012). Thus, in the view of literature, it can be deduced that there is a lack of robust studies that measure the effect of factors of organizational culture on social sustainability in the construction sector. The published literature justifies the urgency of the research hypothesis which is to identify the impact of factors of organizational culture on social sustainability in the construction industry.

Hence, to fill this research gap, the current study is undertaken. The main aim of the study is to analyze the effect of organizational culture on social sustainability from the perspective of the construction industry by using a systems-based approach. To achieve this aim, the research objectives of the current study include the identification of significant factors of organizational culture and social sustainability in construction, investigation of the influence of factors of organizational culture on social sustainability in the construction industry utilizing a systems-based approach, and formulation of framework model. The systems-based approach serves as a comprehensive technique to evaluate issues in which the impact of individual elements is studied in detail in the whole system (Zhang et al., 2018). This technique utilizes Causal Loop Diagrams (also termed Influence Diagrams) to assess fundamental procedures regarding the gathering of feedback and their underlying impact on defined goals (Rasul et al., 2019; Tahir et al., 2021). The systems-based approach can deal with multiple variables at the same time and it can also generate linkages and interdependencies among them in a complex system. Therefore, a systems-based approach is an appropriate technique to be used in the current study to highlight and assess the causal feedback links among numerous important factors of organizational culture and social sustainability in the construction sector. The significant findings of the study will expand the body of knowledge by proposing a framework through systems-based methodology, which will guide top management, all stakeholders, and key decision-makers to establish an effective environment in the organizations and assist policy makers to strive for the incorporation of social sustainability through the organizational cultures in the construction industry.

2 Literature review

2.1 Organizational culture

Hofstede et al. (2010) proposed a comprehensive definition of organizational culture as the collective functioning of the human brain that differentiates among diverse members of human groups. Similarly, Schein (2004) is of the view that culture is a pattern of shared fundamental assumptions that was learned by a group as it successfully solved its issues of external adaptation and internal integration, that has functioned admirably enough to be considered substantial and, subsequently, to be instructed to new individuals as the right

method to see, think and feel concerning those issues. Further, organizational culture as depicted by Cameron and Quinn (2006) is reflected by what is esteemed, the prevailing leadership and administration styles, the language and symbols, the processes and work routines, and the definitions of achievement that make an association extraordinary. The most impressive factor of successful and dominant companies, which gives them the significant upper hand, and also the competitive benefit, is the organizational culture, while organizational failure and downfall are the outcomes of negligence towards enhancing organizational culture characteristics (Cameron and Quinn, 2006). Rantesalu et al. (2017) concluded from their investigation that by keeping up the organizational culture, a standard is set for the employees where they can completely focus on their tasks and can improve the overall performance and productivity of the organization, which then generates higher internal motivation, the contentment of organizational employees, larger rate of returns and maximized profitability (Olynick & Li, 2020). Moreover, Arditi et al. (2017) indicated from their research that organizational culture directly impacts the chance of making progress towards the attainment of success. Nukic and Huemann (2016) are of the view that organizational culture instigates a perplexity of combined values and beliefs focusing on the attitude and activities of a group, due to which dissimilarities in organizational culture in the construction industry are expected to occur and these differences appear from concerned stakeholders' and organizations' perspectives. This implies the significance of understanding and administering the organizational culture in the construction sector in terms of managing the business effectively (Low et al., 2015). Consequently, Ankrah and Langford (2005) examined the key factors that are responsible for organizational differences and dissimilarities, i.e., coordinating tasks within various departments and circling employees, sources of potential dependent on relationships with concerned managers, systems for control, management, and coordination, the degree of formality, the capabilities of employees, significance for recognition, rationalization, and standardization of tasks.

Furthermore, Long and Fahey (2000) classified four ways in which organizational culture influences the attitudes and behaviors that are considered key components for information creation, sharing, and its use; recognizes the relationships among individual and organizational knowledge; fosters the climate for manageable social sustainable frameworks that features the critical part of how the information will be utilized in explicit situations; and prepares for new and fresh knowledge, with its underlying doubts, make, legitimizes, and conveys inside organizational setup. To accomplish successful knowledge sharing, organizations need to teach their workers to preclude the old perspectives and conventional ways of thinking (Lubis & Hanum, 2020), and embrace the cutting edge tools and strategies to compete in the construction market (Aboramadan et al., 2020) and bring positive impact for the adoption of social sustainability. This sort of positive thinking approach accomplishes the necessary value addition in organizational cultures solely but will result in knowledge hoarding with ineffective abilities (Bilginoğlu, 2019). This can be achieved adequately with the efficient utilization of performance appraisals (Paais & Pattiruhu, 2020). Apart from performance appraisals, a reward system is a substantial aspect of organizational culture because no matter what their nature is, rewards can reinforce, strengthen, and transfer the culture by focusing on the characteristics that are central and crucial to organizations' values. Additionally, Ankrah and Langford (2005) indicated through their study in the perspective of the UK construction sector that the conflicts and disputes within construction projects appear at the interface level due to stakeholders who have differing needs with diverse organizational cultures which directly reflect their approach to work and build relationships with the other concerned project stakeholders. Such stakeholder dissimilarities can be eradicated with the effective and efficient utilization of information and knowledge

generation and sharing the same with concerned project stakeholders to attain all project goals and objectives (Irfan et al., 2019). However, Naoum (2001) concluded from the study that four factors signify and assess the organizational culture type. These include (1) organizational characteristics: size and age, founders', new managers', and subordinates' beliefs; (2) organizations' top management: strategy, hierarchy, structure within the leadership of the organization, and personnel factors; (3) operation and functions: task, and (4). technology and work environment: external and internal". But, Sari and Nugraha (2020) are of the view that culture-related choices of employees, workers, top management personals, tools and technologies, and market trends substantially establish and structure the organizational cultures. The author affirms those normal relations between employees and organizations, hierarchical connoisseur system in indicating the superiors and subordinates, and the regular views of employees pertinent to the organizations' goals, objectives as the three significant judicious organizational culture aspects in analyzing the organizational culture.

However, the general literature on social sustainability emphasizes the equal access of future generations to the social resources (if not more) from which the current generation benefits. As a result, as Zhao et al. (2012) pointed out that the construction industry needs to improve its image by maintaining a healthy work environment. Social sustainability forces construction companies to ensure through effective cultures that sustainability issues in construction are of great interest to customers so that every rational building focuses on people, with health and safety, satisfaction, environmental friendliness, ease of use, aesthetics, and social participation for the benefit of present and future generations (Roca-Puig, 2012). The study conducted by Abidin (2009) examines social sustainability outcomes in the construction industry at the company level and examines issues such as construction companies' views on health and safety, user comfort, welfare, accessibility, social inclusion, employee well-being, and aesthetics (Lima et al., 2021). These aspects are necessary due to poor occupational safety, poor quality of life, inequitable distribution of social construction services, and hazardous practices associated with the activities of construction companies (Bamgbade et al., 2017). Thus, it can be deduced from the published literature that such factors regarding organizational culture may hold the capability to induce a substantial impact on the adoption of social sustainability in the construction sector.

2.2 Social sustainability

Harris and Goodwin (2001) indicated that a system focused on the possibility of the idea of social sustainability should be liberated from bias and should offer access to opportunities equally with adequate facilities regarding the social services that comprise health, safety, and education, no gender bias and discrimination, political responsibility and accountability, and participation that should be accessible to everyone. Another definition presented by McKenzie (2004) characterizes social sustainability as a constructive state that incorporates fairness, justice for everyone, culture, political stability and decision-making, psychological needs, and a process within such communities that will assist in acquiring all these conditions. Griessler and Littig (2005) expanded this idea by describing the satisfaction of human necessities through social sustainability by conserving nature, acquiring social justice for everyone, human integrity and trustworthiness, and political involvement. More refinement to the definition was proposed by Dillard and King (2008); according to them, social sustainability includes four fundamental principles: integrity, human well-being, democratic government and its stability, and democratic civil society processes. In

the perspective of organizations, social sustainability, by and large, calls attention to the corporate social obligation that can be made compelling with sound organizational culture, which generally features morality and social responsibilities, along with the marketing benefits amid stakeholders that arose out of organizations' activities because of social characteristics (Sodangi, 2019). The social sustainability importance in developing nations is being disregarded in the construction projects' development process (Xue et al., 2015), where issues like inequity and imbalance, health issues, poverty, and lack of education need significant consideration in the value creation process.

Furthermore, the published literature has reported on the negative impact of construction activities and the indifferent attitudes of various construction companies towards the human community, leading to the need to improve sustainable construction practices (Khamis & Ismail, 2021). While construction companies are increasingly talking about the importance of effective sustainable development, there is no consensus on what this is about. Social sustainability, although partly difficult to implement, often reflects the social impact of projects on communities. Shaw (2009) argues that social sustainability requires more attention than just financial support, and construction organizations must actively consider the detailed and accurate social costs and benefits of construction projects. According to Mavi et al. (2021), social sustainability emphasizes creating a favorable built environment through careful utilization of construction processes and services to increase overall efficiency and reduce risks to people and the environment. The emergence of these social criteria and the need for more stakeholder's engagement in the strategic planning of sustainable development services in the built environment have led to the development of more active management programs to protect the built environment, as well as the resulting economic and social benefits of construction companies (Wang et al., 2021). While previous research has shown that consumer demand for sustainable construction encourages companies to adopt it, the growing regulatory burden of reducing the impact on potential users and other participants can force companies to redesign their organizational culture and marketing strategies. Another possible solution is to use innovative construction technologies and products to reduce the environmental and social impact of construction projects (Montalbán-Domingo et al., 2021). Understanding the role of innovation as part of organizational culture in promoting the social sustainability of construction is therefore crucial for construction companies to meet the needs of stakeholders. Community advocates also argue that while these social considerations may seem elusive to construction companies, they are as important as the environmental and economic dimensions (Hammond & Peterson, 2007). Subsequently, different authors have researched diverse organizational cultures and social sustainability-related factors as shown in Table 1.

2.3 Influence of organizational culture on social sustainability in construction

The construction activities of the involved organizations profoundly impact the environment, economy, and society (Ameyaw et al., 2017). And the concentration of concerned construction project stakeholders should be redirected to the substantial significance of sustainability (Huemann & Silvius, 2017). Because due to construction activities the exhaustion of natural assets and resources alongside the degradation of the environment occurs (Zhang et al., 2014). The sustainability problems relevant to the construction industry have been embraced by respective key stakeholders and organizations from industry and academia professionals (Silvius & Schipper, 2020). In this regard, efforts have been made, however, the focal point of these endeavors are significantly

Table 1 Factors of organizational culture and social sustainability extracted from published literature

Factors of organizational culture	Author references	Retained factors after content analysis
Internal dimension		
Goal setting and teamwork orientation	Mustafa et al. (2017), Hofstede (2001), Mendo-Lázaro et al. (2017), Cheung et al. (2011), Han and Diekmann (2001)	Retained
Ethical orientation	Bucar et al. (2003), Watson and Weaver (2003)	Retained
Relationship and strategic factors	Fong and Kwok (2009), Mills et al. (2009)	Retained
Reward orientation	Wei and Gima (2009), Elmadağ and Ellinger (2018)	Not included
Value and merit orientation	Fong and Kwok (2009), Mills et al. (2009)	Not included
Power and rules orientation	Hofstede (2001), Li et al. (2016)	Retained
Knowledge administration at the project and organizational level	Fong and Kwok (2009)	Not included
Motivating innovative behaviors	Hartmann (2006)	Not included
External dimension		
Uncertainty prevention	Hofstede (2001), Johnson et al. (2009)	Not included
Long-term and short-term goals orientation	Johnson et al. (2009), Baumgartner and Rauter (2017)	Retained
Market orientation	González-Benito and González-Benito (2005), Nasution et al. (2011)	Retained
Learning orientation	Calantone et al. (2002), Nasution et al. (2011)	Retained
Technology orientation	Nasution et al. (2011), Ankrah and Langford (2005), Zhou and Li (2010)	Retained
Flexibility orientation	Lim et al. (2011)	Not included
Political and business relationships	Chung (2011), Kapoutsis et al. (2017)	Not included
Innovation	Nasution et al. (2011), Brockmann et al. (2016)	Not included
Entrepreneurial and marketing formalization	Johnson and Saini (2009), Williams and Shahid (2016)	Not included
Factors of social sustainability	Author references	Retained factors after content analysis
Respecting and caring for communities and impact assessment	Raheem and Ramsbottom (2016), Chan and Lee (2008), Yung and Chan (2012), Sodangi (2019), Eizenberg and Jabareen (2017), Vasquez and Klotz (2013), Zuo et al. (2012)	Retained

Table 1 (continued)

Factors of social sustainability	Author references	Retained factors after content analysis
Improving the quality of living with minimized population density	Raheem and Ramsbottom (2016), Chan and Lee (2008), Lee et al. (2014), Eizenberg and Jabareen (2017)	Not included
Diversity and inclusion of communities	Raheem and Ramsbottom (2016)	Not included
Involvement and protection of community during construction projects	Raheem and Ramsbottom (2016), Sodangi (2019), Zuo et al. (2012)	Not included
Minimizing the usage of non-renewable resources during projects' construction	Raheem and Ramsbottom (2016), Chan and Lee (2008), Eizenberg and Jabareen (2017)	Retained
Improving attitudes, practices, and high-quality workmanship	Raheem and Ramsbottom (2016), Banihashemi et al. (2017)	Retained
Tracking measures for social sustainability and health and safety protocols	Raheem and Ramsbottom (2016), Banihashemi et al. (2017), Eizenberg and Jabareen (2017), Zuo et al. (2012)	Retained
Awareness of social sustainability and opportunity for skills development	Raheem and Ramsbottom (2016), Banihashemi et al. (2017), Yung and Chan (2012), Vasquez and Klotz (2013)	Retained
Global networking for social sustainability	Raheem and Ramsbottom (2016)	Not included
Responsibility and accountability of organizations	Raheem and Ramsbottom (2016), Banihashemi et al. (2017), Lee et al. (2014), Sodangi (2019), Vasquez and Klotz (2013)	Retained
Stakeholder identification	Sodangi (2019), Valdes-Vasquez and Klotz (2013)	Not included
Focus on projects location	Sodangi (2019), Valdes-Vasquez and Klotz (2013)	Not included

environment-oriented, i.e., waste minimization, CO_2 reduction (Shen et al., 2015), energy proficiency, and water preservation (Zuo et al., 2012). Construction activities directly or indirectly impact social sustainability, i.e., traffic congestion and delays, obstructing economic activities, excessiveness in the production of pollutants, damage to fragile ecosystems, and harm to already present natural and man-made infrastructure systems (Gilchrist & Allouche, 2005). However, these extreme effects can be kept away from robust and efficient organizational cultures with the assistance of key stakeholders in the construction sector. As construction is a social process (Abowitz & Toole, 2009), which is greatly dependent on the organizational culture, and their influence consistently occurs even after attaining the predefined objectives and goals of the construction projects.

Past studies on sustainable development have examined the impact of a company's ability to develop innovative cultures pertinent to organizational sustainability from economic and social perspectives (Banihashemi et al., 2017; Pero et al., 2017). In particular, Chan and Liu (2012) show how innovation and effective cultures rapidly affect an organization's productivity, profitability, and competitiveness, including their critical role in the adoption of social sustainability. In addition, innovative technologies and products from construction companies are key to meeting the growing social security needs of stakeholders, especially in reducing the environmental impact of construction projects. Achieving social sustainability requires a lot of innovation and the transfer of existing technologies and practices as part of the organization's culture. Innovative companies effectively establish new sustainable development strategies and effective culture in their work environments, utilizing their ability to gather useful and valuable information about stakeholder needs that assist them in attaining their sustainability goals (Bamgbade et al., 2019). As per Vanclay (2004), the mutual consensus on social sustainability is not quite common in practices adopted in the construction sector. Even more, the significance of organizational culture in embracing social sustainability is not clearly described and well defined. Oney-yazıcı et al. (2007) revealed from their study that the published literature has not tapped the impact of organizational culture on social sustainability in the construction sector and is still thought to be in the evolutionary stage, and is limited in number. Considering this research gap, researchers like Ankrah and Proverbs (2004) highlighted that more studies should be conducted to uncover and signify the factors of organizational culture, particularly in the construction sector, and their underlying impacts on social sustainability. The status of the current literature has not sufficiently tapped the effect of organizational culture on social sustainability in the construction industry. Although there are many studies that either focus on organizational cultures or social sustainability separately, there are a very limited number of studies in which these two concepts are combined and the impact of the former is measured on the latter. Therefore, to bridge this research gap current study is undertaken to measure the effect of organizational culture on social sustainability through a systems-based approach. Researchers have utilized different methods to illustrate the interdependence between different factors identified in their studies. Some well-known methods include soft system methodology (SSM) (Wang et al., 2015); systems-based approach (Rasul et al., 2021); ordinal regression analysis (Irfan et al., 2019), and causal mapping (Ackermann et al., 2014). However, systems thinking is related to systems dynamics, which provides tools to mediate between qualitative manifestations of the dynamic mechanism and possible quantitative representations of systems (Wang & Yuan, 2017) and is used in the current study. This technique uses graphical diagrams, known as causal loop diagrams, which are the basic structure for numerical simulations. System dynamics models are more reliable (Sterman, 2000); however, CLDs are a system's structure that is crucial in modeling, and these

structures can provide insights into the dynamic mechanisms significant for generating system output (Rasul et al., 2021).

3 Research methodology

This research intends to follow a sequence of steps, techniques, and procedures required to accomplish the pre-defined study objectives for the construction industry. Literature review, content analysis, preliminary field survey, detailed field survey, and system thinking approach are implied. These adopted techniques have solid literature support and have already been published in high-impact factored journals. The adopted research methodology is shown in Fig. 1 and the details are discussed in the subsequent subheadings.

3.1 Preliminary study

After conducting a comprehensive and extensive literature review, several factors of organizational culture and social sustainability were extracted as shown in Table 1. The articles selected were published in the last 15 years, i.e., between 2006 and 2021, and focused on the concepts of organizational culture and social sustainability in the construction industry except for a few research papers published before 2005. The factors whose status is shown as "retained" have been achieved after thorough content analysis by using Eqs. 1 and 2. And, the detailed explanation of this content analysis is presented in the subsequent sections.

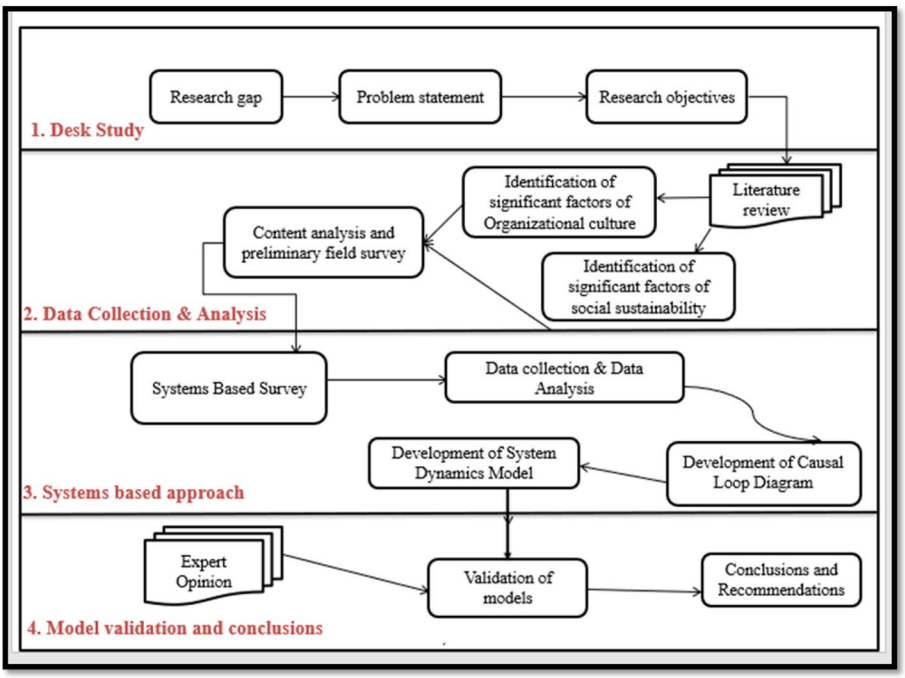

Fig. 1 Schematic representation of methodology

3.2 Systematic analysis of content

The methodology of Ahmed et al. (2019) and Ullah et al. (2017) is followed and utilized in the current study for shortlisting of these factors presented in Table 1. From the results of the methodology, only those factors with a cumulative normalized total score smaller than 0.60 were retained because values higher than this indicate lower significance (Irfan et al., 2020). These results can be viewed in Tables 2 and 3, and following the methodology of Ahmed et al. (2019), and Ullah et al. (2017), the factors were finalized and selected by carrying out content analysis to indicate their significance by utilizing Eq. (1). These selected factors are ranked because of their calculated literature score obtained from a two-part content analysis; in the preliminary part, a quantitative assessment is done where the frequency of appearance of a factor in all the suitable papers is collected, and in the subsequent part, a semi-quantitative conversion is performed by giving a quantitative score to each impact (high as 5, medium as 3, and low as 1) and the largest frequency effect is adopted for every barrier (Ullah et al., 2017; Ahmad et al., 2018; Ahmed et al., 2019). The qualitative impact score on the scale of high, medium, and low was evaluated through content analysis. In doing so, papers were thoroughly read and critically analyzed to figure out the importance of a factor given by the article's authors. To ensure coherence and consistency in the process, the author carried out this process alone (alone means without any other co-author). This helped to eliminate any difference in opinion and understandability between the authors. However, this runs the risk of individual bias which is declared a limitation (Irfan et al., 2020). The literature score is later estimated utilizing Eq. 1, in which 5 is the maximum impact value and frequency is the result of quantitative assessment. This was performed to harmonize the two scales—qualitative and quantitative. The qualitative scale is then further considered as a semi-quantitative scale (where high = 5, medium = 3, and low = 1). Since the qualitative scale is maximized at 5, the quantitative scale is also normalized by multiplying the no of papers by 5. The content analysis is carried out in MS Excel®.

$$\text{Score calculation of Literature} = \text{Impact score} \times \left(\frac{\text{Frequency of appearance}}{\text{Total no. of Papers used} \ * \ 5} \right) \quad (1)$$

Table 2 Finalized factors of organizational culture through systematic analysis of content

Factors of organizational culture	Normalized total score (literature + industry)	Cumulative normalized score	Rank
Goal setting and teamwork orientation	0.124	0.124	1
Ethical orientation	0.069	0.193	2
Relationship and strategic factors	0.069	0.261	3
Long-term and short-term goals orientation	0.068	0.330	4
Market orientation	0.068	0.399	5
Learning orientation	0.068	0.467	6
Technology orientation	0.066	0.533	7
Power and rules orientation	0.058	0.591	8

Table 3 Finalized factors of social sustainability through systematic analysis of content

Factors of social sustainability	Normalized total score (literature + industry)	Cumulative normalized score	Rank
Respecting and caring for communities and impact assessment	0.126	0.126	1
Responsibility and accountability of organizations	0.113	0.240	2
Tracking measures for social sustainability and health and safety protocols	0.102	0.341	3
Awareness of social sustainability and opportunity for skills development	0.102	0.443	4
Improving the quality of living with minimized population density	0.091	0.533	5
Minimizing the usage of non-renewable resources during projects' construction	0.090	0.600	6

3.3 Preliminary survey

Moreover, to get the updated point of view of the construction industry professionals, a preliminary or initial survey was conducted using a questionnaire because it was required to integrate these opinions with what is reported and documented in the literature. For this reason, the final score (FS) calculated for each identified factor was obtained by using Eq. 2, in which LS indicates the literature score for each identified factor and IS shows the industry score attained from the preliminary questionnaire survey. The weighting of 0.4 is given to LS and 0.6 is given to IS was used (Ahmed et al., 2019), since the industry's point of view can best be adopted to establish the relationship between organizational culture and social sustainability in developing nations. Thus, owing to the aim of the current study, the expert point of view was given more priority and weightage, compliant with Ahmad et al., (2018). The estimated FS was utilized to rank the extracted factors. This ranking integrates the academic experts' and construction sector practitioners' points of view:

$$\mathrm{FS} = (\mathrm{LS} \times 0.4) + (\mathrm{IS} \times 0.6) \tag{2}$$

3.4 Gathering of data and evaluation

As the adopted content analysis utilizes secondary data highlighting past research trends and courses, gathering primary data is considered necessary (Rasul et al., 2019). Therefore, to obtain the latest, authentic and reliable primary data, an international survey was conducted to gather the impact of organizational culture on social sustainability. To achieve this purpose, a questionnaire having two sections was created utilizing Google® Docs (Shen et al., 2017). The first developed section of the questionnaire comprised of questions about general information about the respondents, i.e., organization type, respondent designation, qualification, experience, nature of the job, etc. In the second section of the questionnaire, the respondents were asked to rate the impact of finalized factors of organizational culture on social sustainability utilizing a Likert scale of 1–5 (1 = very low and 5 = very high). As a commonly accepted and published rule, the representative is ensured and confirmed with a sample size of 96 or above (Dillman, 2011). This questionnaire survey was floated and shared worldwide to targeted respondents possessing experience with construction projects through online professional platforms, i.e., LinkedIn®, social networking websites like Facebook®, and research network websites like ResearchGate®. After gathering data, its reliability and validity was ensured by fundamental statistical test using SPSS®.

3.5 Systems-based approach

To determine the interconnectivity and combined effect of the variables (factors), the level of influence (causal strength) and relationship (polarity) of contributing factors were explored by following the methodology of Rasul et al. (2021). A detailed questionnaire survey was disseminated nationally and internationally to the field experts based on which influence matrix and causal loop diagram were developed. The system dynamics model with the software of VENSIM® was developed via information extracted from a causal loop diagram about the influence of one factor over the other and positive/negative

polarities. A causal loop diagram has been used for imagining how different variables correlate and how they go together to create system dynamics. Moreover, in a model-based methodology, the validity of a model is an utmost aspect as the validity of results analytically depends upon the validity of the model. Structural and behavioral verification tests were conducted in this respect (Rasul et al., 2021). Additionally, to get more refined outcomes from the developed models, it was validated by 10 industry experts. They were having an average experience of more than 11 years. Their suggestions were also incorporated and the final results were modified accordingly. Finally, results and conclusions were drawn based on the drawn findings. It is significant to mention here that in the current study qualitative systems dynamics methodology is used. In this specific technique, the closed cyclic loops which are called "causal loop diagrams" are developed. In that, we only get interdependencies or linkages between the identified factors. We do not have any numerical values for this methodology as highlighted by (Rasul et al., 2021).

3.6 Demographics of Survey

One hundred five questionnaires were distributed among industry practitioners to get their responses to the questionnaire. Industry respondents incorporated all three key internal stakeholders (client, consultant, and contractor) in the questionnaire survey because they are considered the main stakeholders in the construction sector (Irfan et al., 2020). Only 7 questionnaires were discarded because they were not filled by the respondents properly. Ninety-seven questionnaires were utilized for subsequent analysis with a response rate of 92.38%, and the current sample size satisfies the minimal size of 96, validating the representatives and significance of responses (Dillman, 2011). Qualification-wise, 49% of responses were from M.Sc. holders, and 14% of responses were from Ph.D. holders, depicting that 63% of responses were obtained from highly qualified professionals. A reasonable 34% of responses were gathered from B.Sc. graduates, and a mere 3% of total feedback was obtained from diploma holders. The outcomes from the survey reveal a moderate to an exceptional understanding of organizational culture and social sustainability by more than 72% of respondents, reinforcing the confidence in the quality of data. Concerning the working experience of respondents, 9% of respondents had working experience of more than 20 years, 3% had 16–20 years, 16% had 11–15 years, 29% had 6–10 years, and 43% had 0–5 years. The background of respondents comprised 23 Project Engineers (24%), 21 Project Managers (22%), 17 Project Directors (17%), 6 Construction Managers (6%), 5 Site Managers (5%), 3 CEO (3%) and 2 Designers (2%) as well as other professionals like design engineers, Administration Personal, etc. Respondents belonged to both government and private sectors. 42% of the respondents were from the government sector, while 44% were from the semi-government, whereas 14% were from the private sector, as shown in Table 4.

From the collected responses, the respondents from major countries who participated in the questionnaire survey were Pakistan, Qatar, India, UAE, Saudi Arabia, USA, UAE, Australia, Turkey, Ghana, Serbia, Italy, and the UK, as shown in Fig. 2.

3.7 Limitations of methods used

The current study has used two major methods for studying the effect of organizational culture on social sustainability. The first one is systematic content analysis. This method has been adopted for shortlisting the most significant factors for organizational

Table 4 Respondent demographics who participated in the survey

Profile	Frequency	Percentage (%)
Total responses = 97		
Job title		
Construction manager	6	6
Project engineer	23	24
CEO	3	3
Site manager	5	5
Designer	2	2
Project manager	21	22
Project director	17	17
Others	20	21
Years of professional experience		
0–5	42	43
6–10	28	29
11–15	16	16
16–20	3	3
Above 20	8	9
Organization type		
Government	41	42
Semi-Government	43	44
Private	13	14
Education		
Diploma holder	3	3
Graduation	33	34
Post-Graduation	48	49
PhD	13	14
Understanding of organizational culture and social sustainability		
No understanding at all	4	4
Slight	23	24
Moderate	52	54
Exceptional	18	18

culture and social sustainability. In this method, the qualitative impact score of the identified research articles was measured on a scale of high, medium, and low. In doing so, the published articles were carefully evaluated to figure out the importance of a factor given by the article's authors. To ensure coherence and consistency in the process, the author carried out this process alone (alone means without any other co-author). This helped to eliminate any difference in opinion and understandability between the authors. However, this runs the risk of individual bias which is declared a limitation (Irfan et al., 2020). The second method used is qualitative system dynamics. The major limitation of this method is the absence of numerical values. It develops CLDs and these CLDs show the interrelationship or linkages between different factors (Rasul et al., 2021).

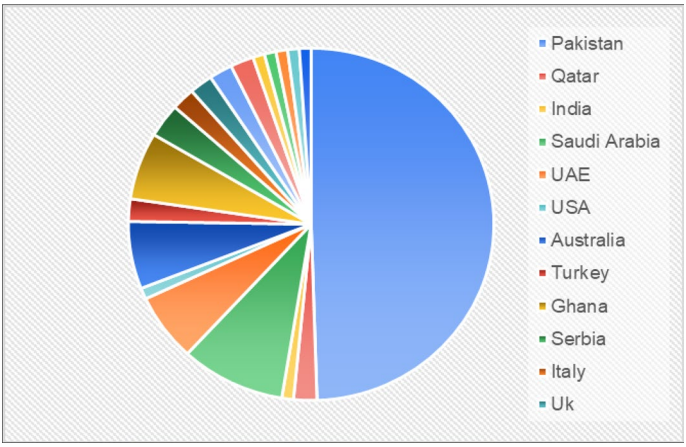

Fig. 2 Regional distribution of respondents who participated in the survey

4 Results

The results of Tables 2 and 3 indicate that the factors with maximum significance, i.e., cumulative normalized scores less than 0.60, are selected for further evaluation from a pool of extracted factors that are shown in Table 1. Furthermore, after detailed content analysis and ranking of factors based on the cumulative normalized scores of all the barriers, the first 8 factors of organizational culture and 6 factors of social sustainability were finalized for further assessment in the development of system dynamics models. It is significant to note that these results are not merely dependent on the frequency of their appearance but includes the impact score given to that particular factor. Therefore, the greater no. of appearance or frequency does not depict its higher ranking. The impact score value significantly decides the ranking together with the frequency values of any factors. Consequently, calculating the internal consistency and reliability of gathered data, the value for Cronbach's alpha came out to be 0.823. As, the values ranging between 0.70 and 0.95 are acceptable for subsequent evaluation (Tavakol & Dennick, 2011). Therefore, the gathered data utilized for the current study are valid and reliable.

4.1 Causal loop diagram

A causal loop diagram is a qualitative way of imagining how different variables correlate with a system and how they go together to create system dynamics (Dhirasasna & Sahin, 2019). There are two types of loops in causal loop diagrams which are used in the current study:

Reinforced loop A type of loop that reinforces a trend within a loop. Mathematically, it is a loop with equal or zero negative polarity.

Balance loop A loop of this type in which the trend declines or balances within the loop. Mathematically, a loop with a negative polarity number.

The following Fig. 3 is a combined causal loop diagram showing the four reinforcing and one balancing loops. This process of loop development depends on the subjective perspective of the author. If the change in one direction compounds the change, the loop will be considered reinforcing, and if the counter change in one direction results in a change in

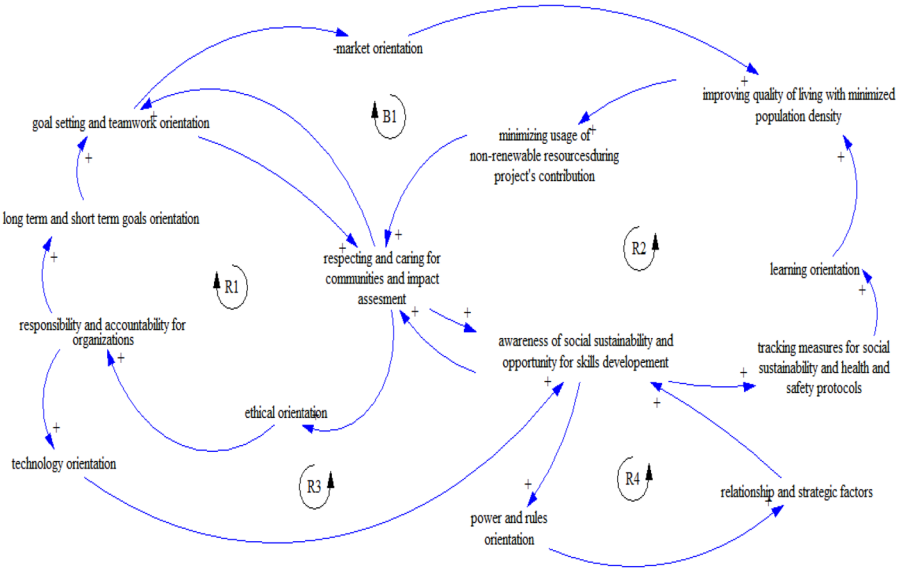

Fig. 3 Combined Causal Loop diagram of factors of organizational culture and social sustainability

the opposite direction, it is termed a balancing loop in the causal loop diagram (Fredericks et al., 2008). The description of each loop is given below in Fig. 3.

4.2 System dynamics model

The stocks and flows are two basic building blocks in system dynamics modeling whereby Stock is a variable that is measured at a particular point in time and flow is considered as a variable that is measured over a period. These diagrams depict the structure of a system in greater depth than a causal loop diagram. Stocks are essential for creating behavior in a system, while flows cause stocks to fluctuate. The equations of a system focus on the composition of each stock and flow. The stock-flow diagram should show how stocks and flows are interconnected to produce the feedback loops and how the feedback loops interlink to create the system (Bala et al., 2017). To visualize and study the complex behavior of the variables of organizational culture on social sustainability, a stock and flow diagram was developed using the software "VENSIM®", and it was further converted to a system dynamics model as shown in Fig. 4. The qualitative methodology has been chosen to develop the System Dynamics model because it is easy to understand and aids decision-makers in policymaking (Dhawan, 2011). The two variables, "Respecting and caring for communities and impact assessment" and "Awareness of social sustainability and opportunity for skills development", which can be regulated by flows, are stocked in this dynamic model because they are a source of many of the relationships in the diagram. The stocks are decided based on a greater number of relationships and thus show the combined effect. Another stock, "Social Sustainability" was added to examine the combined effect of the two stocks. This model thus leads to accomplishing the research goal of sorting out the effect of organizational culture on social sustainability. The feedback collected in a detailed

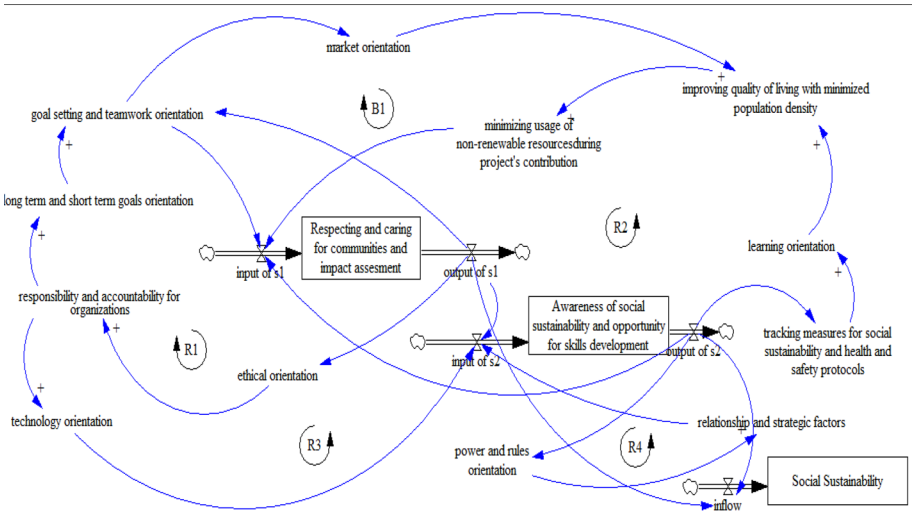

Fig. 4 Stock and Flow diagram for analyzing the effect of organizational culture on social sustainability

questionnaire survey helped in the development of equations for the model. The equations were established using the normalized field score to connect the system mathematically.

4.2.1 Simulations

Simulations were run to understand the dynamic behavior of the complex system over five years. Rather than focusing on all the variables, simulation results will highlight the intrinsic nature of the network, emphasizing the stocks that represent the trend of organizational culture variables on social sustainability that seem to be increasing. Due to the increase in the stock trend, there will be a rational effect on the subsequent variables in the loop (Barranquero et al., 2015). The behavior in Fig. 5 shows the increase over five years. This is due to the integrated effect of variables influencing the behavior of a stock. As the current study focuses on the effect of organizational culture on social sustainability, the selected stocks are not the factors of organizational culture because we selected stocks based on the relationships. As stocks show accumulation (more no. of relationships), the factors of organizational culture affecting social sustainability are as shown in the model. The model presents an aggregated view of the effect of organizational culture variables on social sustainability. An additional stock named "social sustainability" is created to represent the accumulated effect of all variables on social sustainability. The period for simulation is selected as five years, which is just done to imitate the effect for a specific period.

Figure 5 is the graphical representation of simulation results for all stocks where the horizontal axis represents time and the vertical axis represents the increment in the equations from the initial value of 100. For instance, in 2 years with the same trend, the value of the stock would be 102. Considering, "respecting and caring for communities and impact assessment", the trend of this stock is noted to be increasing over the years. The escalation in the trend is likely to affect other succeeding variables that will inevitably lead to social sustainability. Similarly, the graphical representation of simulation results for "awareness of social sustainability and opportunity for skills development"; like the trend of the previous stock, is noted to be increasing over the years as well, i.e., in 5 years it will increment

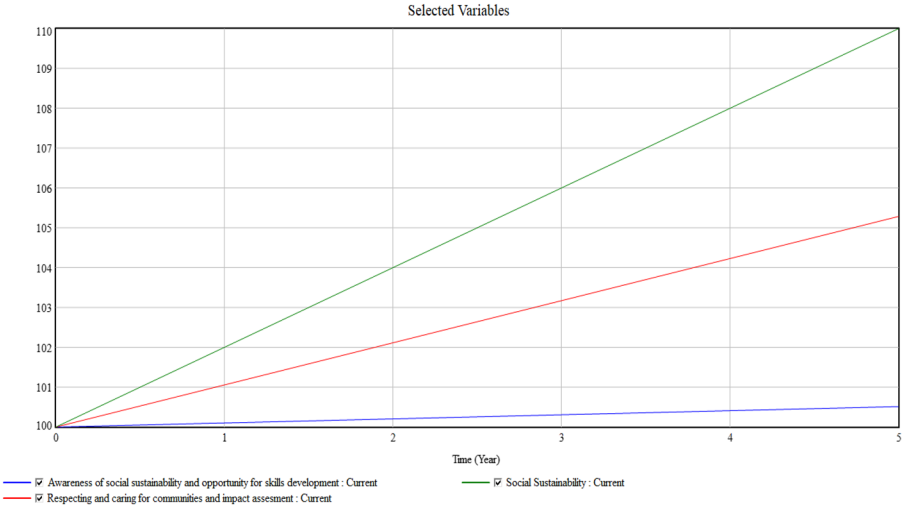

Fig. 5 Simulation results of stocks forecast for 5 years

to a value of 100.5. The escalation in the trend will probably impact other succeeding variables that will eventually lead to social sustainability. Further, the graphical representation of simulation results in "social sustainability", the trend of this stock is noted to be increasing over the years and touches the value of 110. This stock is showing the cumulative effect of the above two stocks. All in all, these values of stocks indicate that if an organization implements robust organizational culture, then social sustainability is significantly impacted when this effect is set to be forecasted for 5 years.

4.2.2 Model validation

Model validation is considered a critical step in system dynamics methodology. There exists a strong relationship between the validity of a model and its "purpose" (Barlas, 1996). The purpose of the model is not fulfilled unless the model is verified. As mentioned earlier, the main purpose of the model is to study the behavior of organizational culture variables on "Social Sustainability". Therefore, the step to model validity is established to prove that it is vital for its core purpose. Some of the tests used to validate the model are; boundary adequacy test, structure verification test, and parameter verification test, (Qudrat-Ullah and Seong, 2010), which have been performed for this study.

4.2.3 Boundary adequacy test

A boundary adequacy test was carried out to check whether the important conceptions in addressing the issues are endogenous to the model, and also if the behaviors of the model change considerably when boundary assumptions are relaxed (Sterman, 2010). The system dynamics model includes all the variables extracted through an extensive literature review, and these were then verified via expert opinion. Thus, the variables were found endogenous to the model. In addition, the behavior of the model did not change with the varying boundary conditions.

4.2.4 Structure verification test

This test aims to verify whether the structure of the model is persistent with relevant descriptive knowledge and information about the system (Sterman, 2010). The interconnected variables in the multiple loops represent the structure of the model. In this particular model, all the variables are chosen through a detailed literature review, and the field experts then authenticated the existence of interrelations amongst variables. This assisted in the development of a logical and meaningful causal loop diagram. Thus, the model structure closely represents the actual system in the construction sector.

4.2.5 Parameter verification test

The system was connected mathematically based on the responses collected from the field which proved to be empirical evidence for the sound model structure (Sterman, 2010).

5 Discussion

5.1 Reinforcing loop R1

The reinforcing loop R1 shows that an increase in "goal setting and teamwork orientation" will lead to an increase in "respecting and caring for communities and impact assessment", which will lead to an increase in "ethical orientation". Similarly, an increase in "ethical orientation" will lead to an increase in "responsibility and accountability for organizations", which will further lead to an increase in "long-term and short-term goals orientation" and this will ultimately lead to an increase in "goal setting and teamwork orientation". One of the major goals of social sustainability is to shelter the communities affected by the construction projects, both in urban and rural areas. Agricultural land, natural resources, key public places, heritage, recreational places, culture, and historical sites should be given more attention as these are considered minimum attention in construction projects. The need to take these provisions into account in construction projects will reduce the negative influence of project development on the entire cultural heritage of any community (Shen et al., 2011). One approach involves assessing the impact of construction projects on where communities live, work, play and participate in cultural activities (Valdes-Vasquez & Klotz, 2010). Developed by top executives, key actors, and other key project managers, these interdisciplinary policies create a sense of project ownership and increase respect for the community. Epstein et al. (2010) are of the view that leadership has a key role in positively influencing the organizational culture on sustainability because their decisions regarding the projects will curtail the long-term and short-term benefits to the organizations and communities. And organizational responsibility and accountability can be achieved through effective goal setting, teamwork, and self-realization of ethical values within construction projects (Nguyen & Watanabe, 2017).

All organizations should be held accountable for outcomes that are not socially responsible to society or the workforce (Shen et al., 2011). This can harm society and the workers. Nonetheless, asking for sustainable reports that focus on how organizations better meet their societal sustainability needs in construction projects and how they produce responsible and accountable results for their organizations can bring positive outcomes. Another

component of social sustainability is that communities use constructed projects as payback and through them, revenue is created with the provision of these services (Abdel-Raheem and Ramsbottom, 2016). One way to realize the benefits is to build construction projects that not only pay for infrastructure systems but also generate revenue for the state's tourism community, thus, such income ensures the sustainability of society (Ramsbottom, 2013). Moreover, through robust organizational cultures, the overall performance of the construction projects can be enhanced sustainably and sustainable development objectives can be attained (Huemann & Silvius, 2017), and enhanced productivity in the construction projects, will directly impact the long-term and short-term organization goals and the lives of communities. The results are presented in Fig. 3.

5.2 Reinforcing loop R2

The reinforcing loop R2 shows that an increase in "respecting and caring for communities and impact assessment" will lead to an increase in "awareness of social sustainability and opportunity for skills development", which will further lead to an increase in "tracking measures for social sustainability and health and safety protocols". This increase will lead to an increase in "learning orientation", which will lead to an increase in "improving quality of living with population density" which will lead to an increase in "minimizing the usage of non-renewable resources during projects contribution". This increase will again lead to an increase in "respecting and caring for communities and impact assessment". Awareness of sustainable goals will create sources and opportunities for skill development (Huemann & Silvius, 2017). And with these skill developments of the employees, health and safety protocols can be followed in the projects which will further increase the learning processes (Bamgbade et al., 2017; Saunders et al., 2017). Awareness promotes social sustainability before and during the stages of construction projects by the provision of education, knowledge, training techniques, workshops, and educational materials on the social sustainability factors to be implemented in the construction projects. Awareness requires the participation of construction departments and communities that promote respect for different stakeholders. For instance, methods of disseminating awareness include the utilization of signboards or posters that inform about the authority's project implementation plan, the construction period, and the start and finish dates of construction activities (Khalfan, 2006; Ramsbottom, 2013; Kibert, 2016).

Communication among decision-makers and communities needs to be developed to measure public values created from the public's perspective(Ramsbottom, 2013; Kibert, 2016). Community acceptance allows different project entities to determine which resources are to be utilized, and which should not be utilized in the design and construction stage. It must not be forgotten that minimizing the use of non-renewable resources is linked to respect for and care for society indicator. Furthermore, trusting that organizations become more socially sustainable creates a competitive edge for construction departments in implementing fast, low-cost, sustainable projects (Robin & Poon, 2009). And, because of the perspective of the long-term benefit, the communities can be benefitted only from the development and delivery of renewable energy resources (Karunathilake et al., 2018). Moreover, with the utilization of renewable energy sources quality of life can be improved with the generation of skill development opportunities in these fields, along with the provision of more safety and health benefits, and social, economic, and ecological advantages can be reaped (Kumar, 2020). The results of this loop can be viewed in Fig. 3.

5.3 Reinforcing loop R3

An increase in "responsibility and accountability for the organization" will lead to an increase in "technology orientation", which will lead to an increase in "awareness of social sustainability and opportunity for skills development" that leads to an "increase in respecting caring for communities and impact assessment", which further leads to an increase in "ethical orientation". An increase in "ethical orientation" will again lead to an increase in "responsibility and accountability for organizations. This trend can be viewed in Fig. 3. Moreover, accountability and responsibility are significant organizational phenomena (Ahrne & Brunsson, 2011). A lack of accountability and responsibility is an important source of poor user adoption. A strong organizational culture of accountability and responsibility encourages and motivates technology adoption (Baudot et al., 2020). Employees understand and apprehend that what they do matters and have significance. And they calibrate their behavior and performance accordingly. Likewise, if there is no real responsibility and accountability, it delivers the message that it doesn't matter if employees adopt the technology or not (Rankin & Luther, 2006). Moreover, if the organizations follow their responsibilities and are held accountable for their actions pertinent to the construction projects, it will encourage the organizations to opt for the modern and latest technologies for the smooth functioning of the projects (Oriol et al., 2020). Through the latest tool adoption, social sustainability awareness and skill development can be enhanced. This will impact the communities and will lead to more responsible and accountable organizations through defined ethical values (Awan et al., 2018; Sari & Nugraha, 2020). Practice and behavioral change focus on characteristics pertinent to the development and management of ethics and roles in relationships with staff and communities. This suggests the promotion of positive outcomes from the negative sources in the community (Abdel-Raheem and Ramsbottom, 2016).

5.4 Reinforcing loop R4

It can be seen that an increase in "awareness of social sustainability and opportunity for skills development" will lead to an increase in "power and rules orientation", which will lead to an increase in "relationship and strategic factors". The increase in "relationship and strategic factors" will lead to an increase in "awareness of social sustainability and opportunity for skills development". The results are presented in Fig. 3. According to Zuo et al., (2012) current lack of education, skills development, and awareness of social impacts are restricting social sustainability in the construction industry. With more information and data on social sustainability, more opportunities are obtained regarding skills development which will lead to organizations with more empowerment and robust rules towards relationship building and strategic factors (Bamgbade et l., 2017). With strong relationships between the organizations and strategic factors, it will pave way for a better understanding of social sustainability and opportunities for skills development (Rey-Garcia & Mato-Santiso, 2020). Focusing on preparatory activities within the organization is a prerequisite for applying innovative practices in construction projects (Murphy, 2014). Strategic management and the integration of health and safety protocols in the organization for sustainable development and project management practices play a key role in ensuring sustainability. Responsible people - clients and influential project entities who demand transparency, accountability, and the application of work safety protocols in the organization

participating in the project are in charge of ensuring these protocols, and on the other hand, the organization must be open to accountability and transparency. In short, an essential element of sustainability is "the desire and willingness to take responsibility for decisions and actions" by organizations (Silvius & Schipper, 2016).

5.5 Balancing loop B1

The results from Fig. 3 indicate that a decrease in "goal setting and teamwork orientation" will lead to a decrease in "market orientation", which will lead to an increase in "improving quality of living with minimized population density". This increase will lead to an increase in "minimizing the usage of non-renewable resources during projects' contribution", and this further leads to an increase in "respecting and caring for communities and impact assessment" which eventually leads to an increase in "goal setting and teamwork orientation". Bamgbade et. (2017) highlights that market orientation is a business philosophy where the attention is on recognizing client demands and meeting them. When an organization has a market orientation approach, it centers around planning, designing, and selling goods and services that fulfill client demands to be beneficial and profitable. Market orientation is an organizational culture that determines a company's ability to perceive and respond to rapid changes in consumer demand and put customer satisfaction at the heart of its business (Hajipour & Ghanavati, 2011). It is said that a happy client can multiply an organization's clients consistently. Once an organization places its customers at its core then the decision-making at higher levels becomes efficient because of continuous feedback from customers. Effective decision-making is very important in enhancing the overall living quality. And with improved quality of life, interest in continuous investment in renewable resources can increase (Ibrahim et al., 2021). Adherence to the rules governing the development of renewable energy and increasing income is essential to improving quality of life (Amri, 2017). The results of the current study are aligned with the previous studies. According to Lai (2003), to ensure persistent decision-making and actions on the market, quality goal setting and teamwork play a crucial role in building communities. Similarly, with the utilization of non-renewable resources through improved quality of living with minimized population density, the communities can be impacted positively (Schweitzer et al., 2018). This will eventually help in more effective goal setting and teamwork.

6 Conclusion

Organizational culture has a vital role in the adoption of social sustainability in the construction industry. But the literature has not adequately tapped its impact. The current research has analyzed this aspect by first selecting a list of factors of organizational culture and social sustainability through an extensive review of the literature and then analyzing the impact of organizational culture on social sustainability through a qualitative systems-based approach. The findings from the systematic content analysis indicate that goal setting and teamwork orientation (from organizational culture factors), respecting and caring for communities and impact assessment (from social sustainability factors) are the most significant factors with scores of 0.124 and 0.126. Further, through systems-thinking-based technique, the developed CLDs reflect a complex interacting system showing the linkages and interdependencies between factors, where five loops provide insight into mechanisms that affect social sustainability. Respecting and caring for communities, impact assessment,

awareness of social sustainability, and opportunity for skills development are the most critical and mutual factors between different loops. R1, R2, R3, and R4 are the reinforcing loops under a complex environment interacting with each other. Although, B1 is the only balancing loop in the results that counter changes the impact of organizational culture on social sustainability. This loop acts as a self-constructive, curative, and corrective cycle (Rasul et al., 2021). These loops do not act as independent cycles but work together to shift the factors of organizational culture's impact. Moreover, through the stock and flow diagram, it is found that there are two stocks: respecting and caring for communities and impact assessment, and awareness of social sustainability and opportunity for skills development that were regulated by the flows. The stock "social sustainability" was added, and the rest of the two stocks were merged over it. To observe the combined effect, simulations were run for the model over five years. The graphical representation of the two stocks shows the increasing linear trend for five years. A similar trend is followed by the subsequent stock: social sustainability. Thus, indicating the significance of the two stocks and their underlying impact on social sustainability.

Furthermore, the challenges pertinent to the adoption of robust organizational cultures in the construction industry from key stakeholders an obstacle to the attainment of social sustainability in the projects. The inclusion of all major stakeholders and top management in the decision-making and policy formulation in this regard can play a vital role. Moreover, respecting and caring for communities, impact assessment, awareness of social sustainability, and opportunity for skills development are the most important factors that should be incorporated by the organizations. This initiative from the organizations will assist in the achievement of social sustainability in the construction industry. The results of the current study are original, and significant in the sense that they will help and guide the top management and policymakers regarding the importance of organizational culture toward social sustainability in the construction industry.

6.1 Theoretical implications

This research has highlighted some significant findings that can bridge the gap between theory and practice within the construction sector, thus substantially signifying its theoretical implications. The coverage of published literature on the subject of organizational culture and social sustainability in the perspective of developing economies is scarce and even more, the studies analyzing the impacts of factors of organizational culture on social sustainability indicators have not sufficiently tapped this significant subject. Therefore, the current study bridged this gap in the theory and proposed a holistic framework in which the most important factors of the organizational culture and social sustainability in the construction industry of developing countries have been shown with their interdependencies through CLDs with the utilization of qualitative systems approach. These key factors can assist the practitioners and academicians in further investigating the linkages between them with more in-depth analysis pertinent to the subject under study through the inclusion of other diverse parameters.

6.2 Practical implications

Apart from the theoretical implications of the current study, the underlying practical implications of the present research are also considered significant for construction industry professionals. The significant findings of the study have expanded the body of knowledge by

proposing a framework through systems-based methodology, which will guide top management, all stakeholders, and key decision-makers to establish an effective environment in the organizations and assist policymakers to strive for the incorporation of social sustainability through the organizational cultures in the construction industry. The model gives an understanding of vicious cycles involving the factors of organizational culture and social sustainability, which can assist project teams to understand and predict system behavior and assign management strategies respectively in their projects. In addition, the CLD determines the logical way to look at the relationships and interactions between different important causal factors, and these closed cyclic loops/causal cycles can assist project managers and decision-makers on how to behave in possible processes within such a system.

6.3 Study limitations and future directions

The current study was limited to a small number of factors pertinent to organizational culture and social sustainability. However, to enhance and magnify the results, other factors pertinent to organizational culture and social sustainability in the construction sector should be incorporated into future studies. Moreover, cross-comparison can be generated between developed countries and developing countries in the current subject area. It is important to mention that the qualitative systems approach makes it possible to understand the administrative problems not by calculations, but by deduction of the behavior of the presented system. The method in this study deliberately dismisses the use of numerical data, even though it allows the utilization of such data when available. However, it should be acknowledged that qualitative or quantitative models, only aids the decision-making process by explaining the behavior of complex systems through linkages and interdependencies, and they in no context provide specific project-related advice to industry practitioners. It requires that the model be linked to case-oriented systems or expert systems so that the project team can be consulted in real-time about problems encountered during construction projects (Naveed & Khan, 2021).

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