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Stakeholder Power Dynamics, a Key to Sustainably Win the Sustainability Game in Construction

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Abstract. Enhancing sustainability in construction is a challenging endeavour, as it requires close collaboration among multiple stakeholders within a turbulent environment. This challenge is further complicated by the existing power dynamics among these stakeholders. This study aims to explore the implications of stakeholder power dynamics for solutions designed to enhance construction sustainability. Through a review of peer-reviewed journals and conference literature, followed by thematic analysis of qualitative data, we found that stakeholder power dynamics substantially influence both the implementation and post-implementation phases of interventions intended to promote sustainability within construction projects. Additionally, the introduction of these initiatives often alters the dynamics of power within project networks, necessitating continuous monitoring and analysis of the power relationships among the stakeholders. Therefore, while it is crucial to assess how stakeholder power dynamics can inhibit or facilitate the implementation, it is equally important to understand how these power relationships will be affected post-implementation and how the new dynamics may impact the long-term sustainability of the solutions. Consequently, we identify stakeholder power dynamics as a key to sustainably win the sustainability game in construction.

Keywords: power dynamics · sustainability · stakeholder · construction industry

1 Introduction

Construction is one of the most influential sectors shaping economies, societies, and environments [1–3]. However, despite its significance, it is often criticised for being scarcely sustainable due to its excessive resource consumption and exploitation, environmental pollution, corruption, and poor community relations [2, 4, 5]. As a result,

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construction projects exert substantial economic, environmental, and societal pressures on their societies of context, necessitating an urgent resolution of their inherent problems. Numerous solutions have been introduced and applied to improve the sustainability of construction projects. However, a successful and sustainable implementation of these solutions requires a close collaboration among the stakeholders involved that is always influenced by power dynamics within the group [3, 6–15]. Depending on its direction and purpose, stakeholder power dynamics can either facilitate collaboration or lead to adversarial relationships, significantly affecting the efficiency, cost, and sustainability of construction projects [16]. Therefore, stakeholder power dynamics is a critical factor in construction sustainability, and this study aims to explore its implications for the sustainable implementation of solutions intended to improve sustainability in the construction industry.

2 Research Method

We adopted a traditional approach to literature review, which aligns well with the aim of this study [17]. To this end, we utilized Scopus as the scientific database and developed a search string: power AND (stakeholder OR actor OR collaborator OR "interest group" OR party OR parties OR agent OR player OR partner OR ally OR allies), limiting the results to the subject areas of business and engineering that have "construction industry" in their keywords. This search yielded a total of 177 results. After a title, abstract, and keyword review, we included a total of fifteen studies that were peer-reviewed, written in English, and discussed the implications of stakeholder power dynamics for sustainability interventions in construction projects. We then conducted a thematic analysis using NVivo software package. For this purpose, we utilized the Triple Bottom Line sustainability framework [18] and the recommendations by Jiang, et al. [19] as the foundation for adopting a holistic view in identifying the key themes that enhance value creation and sustainability in construction [20]. Additional references were consulted as needed to address analytical gaps. The steps of the literature review process are illustrated in Fig. 1.

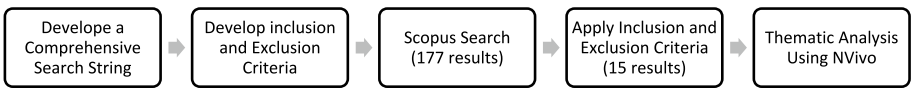


Fig. 1. Literature review flow chart. Source: author's own work.

3 Literature Review

3.1 Collaboration

Collaboration is referred to as a process in which a group of independent parties gather to solve a problem domain through interdependent processes by sharing rules, norms, and resources [21]. Stakeholder collaboration plays a crucial role in achieving project goals

and improving sustainability by driving innovation, reducing costs, and maximizing efficiency. Thus, construction sustainability is highly contingent on the level of collaboration between project parties [22, 23]. Yet, achieving collaboration between project stakeholders is not an easy undertaking since project parties are often linked together based on adversarial relationships that undermine their willingness to work together [16]. When discussing collaboration, power relationships between the participants is the main factor that can either impede or facilitate collaboration depending on its direction and aim [24, 25]. Hence, given its determinant role, stakeholders power dynamics needs to be investigated to successfully improve construction sustainability [6].

3.2 Power in Sociology

In sociology, power is commonly known as the capacity to prioritize one's own interests over that of others [26]. A contemporary sociological definition views power as the extent to which one can influence the other party and draw their desired outcomes [27]. According to the "resource dependence theory of power", powerful agents are those who have a higher control over critical and irreplaceable resources [28]. Since power is generally distributed unevenly, some parties have a higher control and influence over the critical resources compared to others [29]. Power relations thus, describe the dynamics by which one individual or entity has the ability to influence social behavior of another to act in accordance with their wishes [30]. Power dynamics encompass the underlying structures and influences of power among individuals and groups within a specific setting. Generally, there are vertical and horizontal types of power [31]. For instance, vertical top-down power can refer to a main contractor's authority to terminate noncompliant subcontractors, while lateral or horizontal power may involve elements that facilitate or disrupt collaboration between various project teams [32].

3.3 Construction Stakeholder Power Dynamics and Sustainability

In project management, power is perceived as a stakeholder's capacity to influence project goals [33]. Given that power relationships between stakeholders can undermine collaboration and that stakeholders' approaches vary in exhibiting a collaborative attitude [34], stakeholders' power dynamics play a crucial role in achieving project objectives [32]. It is also one of the key challenges when implementing sustainability-related targets in construction projects [6, 35] and therefore, it has to be accounted for to achieve the full potential of these initiatives.

Sustainability is viewed from environmental, economic, and social aspects as per the Triple Bottom Line (TBL) sustainability framework. Environmental sustainability involves minimizing the environmental impacts of built products throughout their lifecycle. Economic sustainability involves minimizing the lifecycle costs of built products, and social sustainability takes into account the stakeholders' perspective regarding the construction project [36]. Also, methods to improve construction project management sustainability include waste management, energy management, construction materials management and low-carbon management, green rating system, sustainable design, lean construction, knowledge management, capability building, value management, and implementation of new technologies [19]. Considering the above, almost all

improvement efforts aimed at reducing waste, costs, injuries, etc., also enhance construction sustainability. Given the significance of stakeholder power, its implications for the successful implementation of the above initiatives need to be investigated.

3.4 Stakeholder Power Dynamics and Sustainability Improvement Initiatives

Project Delivery
Improving project delivery issues has been identified as one of the main areas enhancing sustainability of construction supply chain [6]. Construction supply chain research often focuses on improving project delivery and proposes modern collaborative approaches to construction project delivery such as partnering, alliances, and relational contracting for mitigating obstacles. However, achieving these improvements is contingent on effective stakeholder management and understanding power dynamics within the supply chain [6, 7]. Making construction supply chain less susceptible to disruption require stakeholder engagement, trust, and collaboration [37]. Thus, stakeholders are encouraged to discard their distrust and opportunistic behaviors to sustain the partnership's social system [38]. Considering the prevalence of distrust and power relationships in construction project environments [10], stakeholder power dynamics is still a key issue when implementing supply chain sustainability solutions.

Innovation
Innovation is important for improving sustainability because it enhances performance. However, construction industry does not offer a favorable environment to drive innovation among construction firms due to the supply chain fragmentation of the industry, which is a result of undermined trust triggered by power relationships between the players [39]. Accordingly, power relationships between stakeholders need to be taken into account to improve collaboration and drive innovation leading to enhanced sustainability in construction projects. Nonetheless, as Vitry, et al. [8] discuss, such considerations have remained scarce in the adoption process of innovative approaches in construction projects.

Technology Adoption
Successful technology adoption requires close collaboration between the involved parties. For instance, Schweber and Harty [40] emphasized the role of socio-technical networks to adopt 3D-CAD software and environmental assessment technologies. Additionally, Papadonikolaki [41] discussed the impact of collaboration and power dynamics as key drivers for achieving the full potential of Building Information Modeling within construction projects. The adoption of off-site construction, prefabrication, or modular construction is also another manifestation of technology adoption in construction [9] that requires stakeholder collaboration to overcome the barriers. Furthermore, technology adoption impacts the dynamics of power within the supply chain. For instance, the adoption and implementation of offsite construction shifts traditional on-site activities to off-site facilities, necessitating a reengineering of supply chain practices to address the impacts of the new dynamics on organizational interfaces [7]. Additionally, prefabricated construction faces a major challenge in the form of high capital costs. This

issue can be mitigated if collaboration between stakeholders is improved [9]. As mentioned, enhancing collaboration requires trust to counteract power relationships. Hence, stakeholder power dynamics are pivotal in improving construction sustainability through technology adoption.

Knowledge Sharing and Information Exchange

Sharing knowledge and exchanging information are fundamental drivers of interfirm collaboration in networked environments [42], primarily because they enhance trust and supply chain integration [37, 38]. For instance, boundary objects such as reports, drawings, and specifications play a crucial role in improving collaboration within multidisciplinary project teams [11]. Another example is public consultation and engagement processes in construction projects to garner support and collect feedback from the public, as well as addressing their grievances. However, despite their intention, such processes are commonly characterized by opposing interests and unequal power relationships [10]. On the other hand, smoother information exchange and shared knowledge change the dynamics between actors. Thus, achieving a sustainable information exchange and knowledge sharing in construction project environments requires not only overcoming stakeholder power relationships but also considering the impact on these dynamics after their introduction [11]. Consequently, significant consideration of power dynamics is essential for sustainable information exchange and knowledge sharing to effectively enhance sustainability in construction.

Site Safety Practices

Site safety is one of the most important indicators of construction sustainability [43]. According to Stiles, et al. [12], the success of safety interventions in multistakeholder environments such as construction projects requires motivation and commitment to change from each participant. Given that perceptions of and commitment to safety culture vary among different members, the success of safety interventions is highly contingent on the relationships between them. This highlights the role of more powerful stakeholders, such as clients and principal contractors, in leveraging their power, using their influence, and enforcing safety principles on-site [3, 12]. Accordingly, in the case of site safety, the differing power dynamics between the Principal Contractor and their Supply Chain influence safety interventions to bring about a sustainable work environment for construction projects. However, despite their importance, there has been less attention paid to the relational aspects of construction safety in research [44].

Social Responsibility

Social Responsibility (SR) is the incorporation of social obligations into strategic objectives to enhance efficiency and performance. Such social obligations may include the reduction of resource exploitation, waste, environmental pollution, noise, and disturbances to local communities. Therefore, implementing SR is crucial to improve construction sustainability [13]. Nonetheless, achieving sustainable SR requires each player to make their own contribution, thus rendering the involvement and collaboration of multiple internal and external stakeholders imperative [4, 13, 45]. The challenge here is the dynamics and multiplicity of project stakeholders gathering with varied expertise, resources, values, cultures, and aims to get the job done [4]. Additionally, the dynamic

nature of stakeholder power necessitates continuous analysis of power dynamics to sustainably and consistently implement SR in different project phases [3, 13]. Furthermore, since implementing SR requires allocating scarce resources and considering that organizations vary in their capacity to access such resources, aligning power with responsibility is essential for sustainable SR implementation. Powerful stakeholders often tend to avoid challenging responsibilities, passing them to less powerful parties with limited resources and expertise. Therefore, it is vital to leverage the influence of more powerful stakeholders, such as clients and principal contractors, to carefully analyze and align power with responsibility. In this regard, incorporating power theory helps to maintain the balance between stakeholder power and their responsibilities. Notwithstanding, research on the relational aspects of implementing SR in construction is limited [45] and therefore, further research is encouraged [13] to improve the sustainability of SR implementation in construction projects.

Environmentally Friendly Solutions
Stakeholder power dynamics also critically influence the successful implementation of environmentally friendly solutions such as green building and sustainable development [35]. For instance, consultants are encouraged to leverage their expert power to advocate for sustainable practices [13], and other stakeholders are encouraged to overcome resistance, step out of their comfort zones [35], and adopt the proposed green practices. Furthermore, accommodating the influence of local communities and balancing power relationships with them has been found to be an effective measure for the successful implementation of sustainable energy development projects [46]. As a result, stakeholder power dynamics are a determinant factor for the successful implementation of environmentally friendly solutions in construction projects.

Lean Construction
Lean Construction practices aim to reduce waste in construction processes, thereby enhancing construction sustainability [47]. Modern collaborative project delivery models, such as partnering and alliances, operate based on lean principles [48] and as previously discussed, stakeholder power relationships are a critical factor in the sustainable and successful implementation of these models. Additionally, Value Management is another Lean Construction method that can enhance construction sustainability [6], and its implementation requires active stakeholder engagement to collaboratively define and maximize value [49]. Therefore, the sustainable implementation of Lean Construction initiatives depends on stakeholder collaboration, which is influenced by power relationships among them.

4 Conclusion

This study highlights the critical importance of stakeholder power dynamics as a key factor in the sustainable implementation of measures aimed at improving construction sustainability. The implications of these dynamics for various interventions—including collaborative project delivery models, technology adoption, knowledge sharing and information exchange, site safety, social responsibility, environmentally friendly practices, and Lean Construction practices—are discussed. To successfully implement these

sustainability interventions, close collaboration among the involved parties is essential, and this collaboration must be informed by a careful consideration of power dynamics within construction projects. Moreover, for sustainability measures to be implemented successfully, it is crucial to continuously analyze power dynamics after implementation, as these dynamics are likely to evolve in response to the introduced solutions. Powerful stakeholders, such as contractors, property owners, and consultants, should leverage their influence to advocate for sustainability initiatives. Therefore, stakeholder power dynamics play a pivotal role in achieving sustainable outcomes in construction. This study is one of the first to emphasize the significance of these dynamics in the sustainable implementation of construction sustainability initiatives and calls for more focused research on the sociological factors influencing sustainability in the construction industry. Future research should explore how stakeholder power dynamics can be harnessed to ensure the successful and sustainable implementation of the discussed measures.

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