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Research Article

A Pathway to Corporate Social Responsibility: Contractors' Major Moves in the Context of Post-Disaster Reconstruction

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Numerous studies have explored contractors' corporate social responsibility (CSR) at the macro or enterprise levels. Few, however, have considered CSR at the project level or contextualized it in post-disaster reconstruction (PDR) projects. In the event of a disaster, contractors' CSR in PDR projects (P-CSR) is beneficial for facilitating affected citizens in returning to normal life and improving their long-term disaster resilience. Therefore, this study aims to formulate strategies that promote the implementation of contractors' P-CSR. Employing a mixed-methods research design within the context of Chinese PDR projects, the study identified 32 influencing factors, 24 measures, and 4 strategies. These strategies focus on (1) acquiring effective and efficient national emergency supports, (2) sharpening contractors' internal capabilities to enhance disaster resilience, (3) valuing contractors' P-CSR activities and outcomes, and (4) reducing PDR projects' constraints and risks. Together, these measures and strategies form a Y-shaped framework to facilitate contractors' P-CSR implementation. The study findings contribute to the literature by bridging the gap between contractors' CSR implementation and their project-level PDR efforts in the event of natural disasters.

1. Introduction

The frequency and intensity of natural disasters have been increasing, presenting significant challenges and substantial losses for human societies globally [1, 2]. Addressing post-disaster reconstruction (PDR) management has become a matter of paramount importance [3], aligning with the "build back better" principle outlined in the Sendai Disaster Risk Reduction Framework 2005–2030 [4]. Within this context, the implementation of contractors' corporate social responsibility (CSR) in PDR projects (P-CSR) is especially important [5]. Because contractors always have unique, strong control of resource supply chains and critical skills [6]. Contractors' P-CSR is the manifestation of their CSR in the PDR context, referring to contractors' ethical and responsible behaviors to conduct better PDR management. PDR projects feature tight time frames, labor unavailability, challenging supply chains, dangerous working conditions, stakeholder sensitivity, high probability of secondary disaster risks, high social visibility [7–10], and many more challenges, which often lead to variations in contractors' approaches to P-CSR implementation.

In practice, CSR requirements are always specified in the contractual agreement. To promote widespread compliance with CSR activities, Eadie and Rafferty [11] demonstrated that appropriately including CSR clauses in contracts can be beneficial for achieving CSR objectives. However, these required activities are the basic goal of contractors' P-CSR; vulnerable people in disaster-stricken areas also need humanistic care and support, or resilient communities to resist possible disasters in the future. For example, adopting local construction traditions in terms of materials and construction structure to rebuild the primary school or linking women

artisans with wider market demand (thatch roofing, mud plastering, or embroidery) in the PDR process, have been taken into consideration [12, 13]. However, these P-CSR activities are often sporadic and spontaneous, and only competent contractors can conduct inclusive, adaptive P-CSR activities to enhance community resilience. Therefore, the complex and fragile PDR environment provides a unique setting where contractors can examine or review and further their P-CSR.

Contractors' CSR implementation is believed to benefit their reputation, thus leveraging competitive advantage. Moreover, effective implementation outcomes are expected to generate societal benefits [14]. Contractors' CSR implementation strategies are widely discussed and examined in industry and academia [15]. Accordingly, the literature suggests two broad approaches to address contractors' CSR implementation strategies. Qualitative studies identified the key factors influencing CSR strategies, leading to the development of qualitative strategies [16, 17]. Quantitative studies aimed to quantify the impact of these factors and analyze the relationship between the strategies and their influencing factors [18, 19]. Yet, despite the considerable attention given to CSR in the construction sector, there have been no reported breakthroughs in the field of disaster management. As the number of PDR projects grows, the values and practices of P-CSR implementation may spread throughout the organization and positively affect other projects.

This study employed a mixed-methods design to develop a set of generic strategies for conducting or improving contractors' CSR implementation, particularly through PDR projects. The study has three stages: (1) identify factors that influence contractors' CSR implementation, (2) analyze the underlying constructs of contractors' P-CSR implementation influencing factors, and (3) develop a framework for contractors' P-CSR implementation strategies. This study contributes to the literature by illustrating contractors' P-CSR implementation influencing factors and hierarchically prioritizing contractors' P-CSR implementation strategies on an evidence-based basis. Utilizing this framework, stakeholders have access to a reliable pathway to improve contractors' P-CSR implementation.

2. Literature Review

2.1. Contractors' CSR Implementation in the Construction Industry. CSR was prominently discussed in Clark's 1916 article, "The Changing Basis of Economic Responsibility" [20]. Typically, CSR should address not only the needs of business operators but also those of various stakeholders within and outside the firm [21]. Accordingly, CSR is ethically or externally driven and is separate from firms' business activities [22]. The realization of CSR emphasizes firms' social performance and outcomes. Therefore, CSR can benefit firms by reducing costs and risks, strengthening competitive advantages, gaining social reputation and legitimacy, and achieving win–win results through collaborative value creation [23–25].

The construction industry significantly contributes to the economy, environment, and society [26, 27]. Therefore, CSR implementation in this industry has been extensively examined in the literature, particularly from the perspective of contractors operating at the macro or enterprise level in different countries [28–34]. Jones, Comfort, and Hillier [28] acknowledged that contractors' CSR activities encompass aspects such as environment, health and safety, human resources, supply chain management, customers and communities, and governance and ethics. Regarding small and medium-sized firms, Bevan and Yung [29] argued that their CSR can be classified as environmental, community, ethical, and economic responsibility. Additionally, Zhang, Oo, and Lim [30] identified key areas for Chinese construction contractors, including shareholder interests, government commitments, CSR system arrangements, environmental maintenance, customer interests, employee attention, supplier and partner interests, and the well-being of local communities and the public. The construction industry operates on a project-based model; however, little attention has been given to how contractors address and implement CSR at the project level. Notably, Ma et al. [35] have examined the CSR of megaprojects. Considering the limited number of project-level studies, the present study recognizes that the majority of these studies focus on ordinary environments, ignoring the implementation of contractors' CSR within the context of PDR projects.

2.2. Contractors' CSR Implementation in the Disaster Management. In line with the "Build Back Better" principles outlined in the 2005–2030 Sendai Framework [4], building resilience to confront disaster risks constitutes a part of the new global sustainable development agenda. To address CSR implementation within the parameters of an uncertain but urgent and complex post-disaster context, the factors influencing CSR implementation, such as business continuity [36], brand reputation [10], and political connections [37], have been investigated. Various CSR implementation patterns under post-disaster conditions have been examined, including immediate and long-term CSR activities [36], whether business-related or unrelated [38], across symbolic, selective, reactive, and supportive patterns [39]. CSR implementation strategies have also been reviewed, including the enhancement of interorganizational relationships and collaboration [40], the promotion of advanced technology applications [41], and emphasis on the impact of leadership [39]. However, most studies focus on all kinds of industries; there is little about contractors' CSR in the disaster management.

In the construction industry, contractors have leveraged their supply chain networks for building materials, critical expertise, and skills to decrease the vulnerability of key infrastructure directly impacting community recovery. They have played a pivotal role in quickly restoring damaged housing, schools, roads, and other critical infrastructure [6]. CSR implementation in the aftermath of a disaster not only benefits the residents in the affected area by reducing threats to their lives and property and promoting a return to normal social life but also significantly impacts the creation of safe and sustainable resilient communities [5]. CSR implementation by contractors to support disaster relief efforts is inclusive and adaptive,

meeting the sustainable standards and requirements set forth by international organizations for disaster management [4].

However, similar to the broader CSR literature concerning the construction industry and the context of PDR, most studies have primarily explored CSR within the construction industry [30]. These studies delve into various aspects, such as influencing factors and mechanisms and CSR strategies, either in a generalized context or specific to particular industries. Within the realm of disaster management, scholars predominantly examined CSR patterns and strategies adopted by firms in the aftermath of disasters [39], irrespective of industry distinctions. Consequently, there remains a considerable gap in our understanding of CSR within the post-disaster environment, particularly regarding contractors' P-CSR implementation. Lim et al. [42] initiated this innovative and significant work by developing a framework for evaluating contractors' CSR disaster resilience. However, their research lacks a systematic examination of the factors influencing contractors' P-CSR implementation, as well as an in-depth analysis of their implementation strategies. This limitation hampers the extension and expansion of CSR theory in the disaster field and provides minimal guidance for contractors on implementing CSR when disasters strike. Therefore, this study serves as a timely contribution to expanding the understanding of contractors' P-CSR implementation.

3. Methods

3.1. Empirical Context. China is located on the Eurasian continent, with its eastern coast bordering the Pacific Ocean. It has a vast geographical range, and its unique geographical position makes it susceptible to frequent natural disasters. Sichuan, located in the southwest of China, features complex terrain and experiences frequent natural disasters. When disasters strike, numerous contractors from all over the country participate in PDR projects, providing a solid foundation for sample analysis. Therefore, this study focuses on contractors who have participated in PDR projects in Sichuan as the research subjects.

3.2. Research Design. This study employed a mixed-methods design to develop a comprehensive framework for contractors' P-CSR implementation, drawing on the influencing factors identified in the literature. A synthetic literature review was conducted to identify contractors' P-CSR implementation initial influencing factors. The qualitative analysis of the interview refined and verified the proposed influencing factors in Chinese PDR projects, while the quantitative analysis of the questionnaire survey examined the significance of each factor and explored the system nature of factors through exploratory factor analysis (EFA). The mixed-methods design provides rich descriptions based on concrete empirical evidence and contributes to theory development by offering measurable and quantitative evidence [43]. The whole research process is conducted by several steps, as shown in Figure 1.

3.3. Initial Influencing Factors Identified Through References. A synthetic literature review was conducted to identify the initial factors influencing contractors' P-CSR implementation. To identify the relevant research papers, we conducted the Web of Science (WOS) database. The database was selected because it contains extensive, up-to-date coverage of publications and is considered highly prominent in shaping potential research fields. Keywords were selected and used in the literature research by combining keywords that are used to describe CSR in the construction industry or CSR in the disaster management. In addition, international initiatives on CSR management were also used to identify the initial factors influencing contractors' P-CSR implementation.

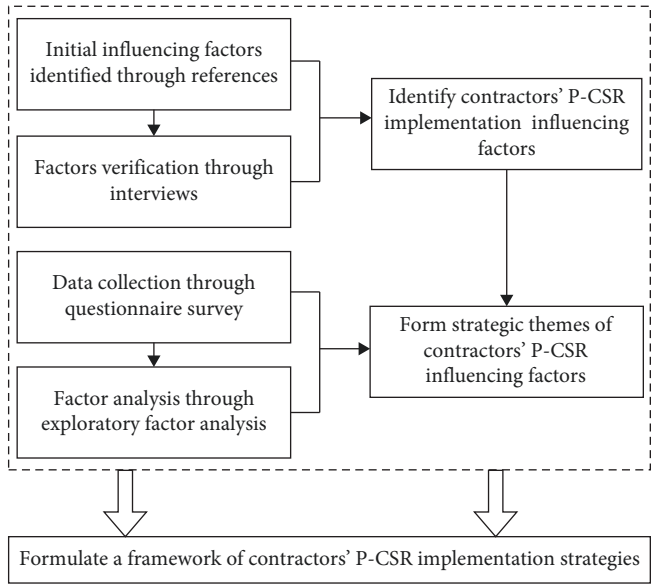

Figure 1: The flowchart of this research.

3.4. Factors Verification Through Interviews. The initial identified influencing factors were refined and verified through face-to-face semi-structured interviews with carefully selected experts. The experts comprised front-line contractors directly involved in executing and operating PDR projects (e.g., project manager and technical director) and executive managerial directors who had engaged in strategic management of reconstruction projects (e.g., department director, CEO). Each interview, lasting approximately 1 h, was audio-recorded with prior permission. In line with accepted statistical practice, interviews were undertaken until saturation occurred, indicating no emergence of new factor categories and limited new information in transcript analysis. All data were collected and analyzed for factor verifications. The verified factors were used as the foundation for the development of the questionnaire survey.

3.5. Factor Analysis Through Questionnaire Survey. The questionnaire aimed to examine contractors' views on the factors impacting CSR implementations in the context of PDR and their extent. The questionnaire survey comprised two main parts: demographic characteristics of target participants and their views on the factors influencing contractors' P-CSR. The first part collected information such as education, working experience, position in the organization, and PDR project

type. The second part examined the importance level of these factors using a five-point Likert scale (1 = very unimportant and 5 = very important).

The participants were selected using stratified sampling to cover front-line contractors actively engaged in PDR projects in China. Specifically, the participants for this study were drawn from the governments' collected PDR project database. Subsequently, the influencing factors were grouped and analyzed using EFA. The analysis specifically investigated how these factors contributed to contractors' P-CSR implementation strategies. Based on the quantitative results, a framework was developed to facilitate systemic implementation strategies for contractors' P-CSR initiatives.

4. Contractors' P-CSR Initial Influencing Factors Identification

In this study, we used the WOS core collection to collect academic papers related to CSR in the construction industry or CSR in the disaster management. After determining the database, we inputted the keywords to collect academic articles. They were as follows: "CSR" or "corporate social responsibility" or "donation" or "ethics" and "contractor" or "construction industry" or "construction firm*" or "construction company*" or "construction enterprise*" or "project" or "disaster*" or "hazard*" or "shock*." Only the articles published from 2000 to 2023 were considered in this study (the research ended on 31 June 2023). The first round of searches identified a total of 431 articles. Afterward, the irrelevant papers had been deleted through reading the title and abstract of the articles, and a total of 62 relevant articles remained. In addition, the Sendai Framework for Disaster Risk Reduction 2015–2030, as the typical international initiative on the disaster management, was also used to identify the initial factors influencing contractors' P-CSR implementation.

In order to comprehensively identify contractors' P-CSR initial influencing factors, an "External–Internal" conceptual framework was formulated. That is to say, all the initial influencing factors mentioned in the academic articles manifested within the internal environmental interface as well as the external environmental interface. For example, external initial influencing factors, such as government emergency support at national and regional levels, facilitate CSR implementation [5], while contractors' abilities related to quick and effective decision-making to adopt complex environments [44]. Finally, 34 influencing factors of contractors' P-CSR were identified (Table 1).

5. Empirical Analysis and Results

5.1. Participants in the Interview and Questionnaire Survey. The diverse pool of interviewees provided enriched perspectives and a comprehensive understanding of contractors' P-CSR. The interviewees held more than 5 years of working experience in the industry, and all had participated in at least one PDR project at the time of this study (Table 2).

The experts meticulously confirmed and revised contractors' P-CSR potential influencing factors. The interview results confirmed most potential influencing factors, but there were specific changes as outlined in Table 3. First, similar factor was merged, such as "environmental policies" being merged into "reward and punishment mechanism." Many documents have clear requirements for environmental protection. Second, certain factor was deemed inapplicable, notably "firm's location." Generally, the distance between the project and the firm does impact CSR implementation. However, in the specific context of PDR, firms participate in disaster relief work based on policies or altruistic motives, mitigating the influence of geographical location.

This study focused on contractors who had participated in PDR projects in Sichuan Province. A total of 350 participants were initially approached for the questionnaire survey. Of these, 227 completed the questionnaires, of which 192 questionnaires were considered valid. The remaining 35 questionnaires were considered invalid (16 questionnaires had incomplete answers, 12 questionnaires were given a score of 1 or 5 for all factors, and the response time of the other seven questionnaires was less than 1 min), yielding a valid response rate of 54.9%. The descriptive statistics of the demographic characteristics are presented in Table 4. The largest group of participants comprised department managers (46.9%), followed by project managers (30.7%) and technical directors (15.6%), with CEOs representing the smallest group (3.7%). The surveyed participants were involved in various types of PDR projects. The primary project type was infrastructure and public service facilities (87%), followed by urban and rural housing (63.0%). In terms of working experience, 64.1% of participants reported having more than 5 years of experience in implementing PDR projects.

5.2. Data Suitability and Factorability. The reliability test was conducted to assess the internal consistency of the questionnaire survey. The Cronbach's α value was 0.961, indicating sufficient consistency. The results of the Kaiser–Meyer–Olkin (KMO) and Bartlett tests (Table 5) showed that the factorability of the data was acceptable (KMO = 0.938). Additionally, considering the sample size, the dataset was suitable for conducting EFA. Bartlett's test of sphericity (Table 5) yielded significant results (χ^2 value = 5,967.1 and P-value = 0.001), suggesting that the correlation matrix significantly differs from the identity matrix, confirming the factorability of the dataset.

In this study, Kaiser's criterion was adopted, wherein only those factors with an eigenvalue of 1.0 or more were retained. According to previous literatures, orthogonal rotation or oblique rotation methods were used to conduct this work, setting the loading of each factor in every component at a conventional high value of 0.5 [66, 67]. Regardless of the methods applied, factor II11 (perceived importance of corporate citizenship) also persisted in having double loadings on construct 1 and construct 3. Therefore, we have deleted factor II11 (perceived importance of corporate citizenship) and redone factor analysis; the factorability of the data was acceptable (KMO = 0.936, χ^2 value = 5,764.3 and P-value = 0.001), and the results are shown in Table 6. The results suggest that a total of 72.75% of the variance can be explained by the proposed influencing factors through a four-factor solution.

Table 1: Contractors' P-CSR implementation influencing factors.

Category	ID	Factors	References
External initial influencing factors	EI01	National emergency organization support	[5, 40]
	EI02	National emergency institution support	[4, 45, 46]
	EI03	National emergency fund support	[5, 45]
	EI04	Government execution efficiency	[4, 46, 47]
	EI05	Reward and punishment mechanism	[27, 32]
	EI06	Supplier requirements	[30, 48]
	EI07	Customer expectations	[12, 27]
	EI08	Resources availability	[6, 49]
	EI09	Climate and secondary disaster risk	[1, 5]
	EI10	Project stability	[12, 46]
	EI11	Contractual requirements	[30, 48]
	EI12	Reliability of financing source	[46, 50]
	EI13	Infrastructure condition	[12, 46]
	EI14	Project size	[49, 51]
	EI15	Project duration	[8, 49]
	EI16	Market competition intensity	[32, 52]
	EI17	Benchmarking roles played by competitors	[33, 53]
	EI18	Organization and association initiatives	[30, 53]
	EI19	Media and public attention	[10, 54]
	EI20	Local customs and culture	[12, 55]
	EI21	Firm's location	[1, 12]
	EI22	Environmental policies	[48, 55]
Internal initial influencing factors	II01	Firm's emergency management ability	[38, 39]
	II02	Firm's ordinary management ability	[27, 44]
	II03	Top managers' decision ability	[56, 57]
	II04	Firm's technological ability	[58–60]
	II05	Firm's financial ability	[12, 27]
	II06	Employees' citizenship	[61, 62]
	II07	Government-firm relationship-driven	[37, 63]
	II08	Talents maintaining and absorbing	[29, 36]
	II09	Financial benefit-driven	[19, 27]
	II10	Reputation driven	[27, 64]
	II11	Perceived importance of corporate citizenship	[62, 65]
	II12	Top manager's values	[33, 57]

Table 2: Profile of participants of interviews.

Number	Working experience (years)	Degree	Professional titles	Stakeholder group
Expert 1	18	Ph.D.	CEO	Consulting firms
Expert 2	15	Master	Project manager	Contractor
Expert 3	13	Bachelor	Project manager	Contractor
Expert 4	8	Master	Technical director	Contractor
Expert 5	6	Bachelor	Department director	Government

Based on the above analysis, the EFA results indicate that contractors' P-CSR implementation influencing factors can be grouped into four strategic themes:

1. Theme 1: Contractors' external pressures and motivations.
2. Theme 2: Project features.
3. Theme 3: Contractors' internal capabilities.
4. Theme 4: National emergency supports.

The Cronbach's α values for the four themes were 0.956, 0.935, 0.939, and 0.932, respectively. All of them are over 0.9, suggesting there is sufficient consistency in each group.

Table 3: Factor revision.

Category	ID	Factors	Revised suggestions
External influencing factors	EI20	Firm's location	Delete
	EI21	Environmental policies	Merge

Table 4: Demographic characteristics of surveyed participants.

Category	Respondents	
	Frequency	%
Education		
Bachelor	122	63.5
Master/Ph.D.	22	11.5
Others	48	25.0
Working experience		
<5 years	69	35.9
5–10 years	61	31.8
15–20 years	43	22.4
>20 years	19	9.9
Position		
CEOs	7	3.7
Project managers	59	30.7
Technical directors	30	15.6
Department directors	90	46.9
Others	6	3.1
PDR projects types		
Infrastructure and public service facilities	167	87.0
Urban and rural housing	121	63.0
Geological hazard control projects	40	20.8
Ecological environment restoration projects	36	18.7
Others projects	10	5.2

Table 5: KMO and Bartlett test.

Test type	Value
KMO	0.938
Bartlett's test of sphericity	
Approx. chi-square	5,967.1
df	496
Sig.	0.001

5.3. Strategic Theme Priorities. After analyzing the four strategic themes, we calculated the average values for the influencing factors within each theme to serve as indicative measures of the theme (Figure 2). The average importance levels show that Theme 3 (contractors' internal capabilities) and Theme 4 (national emergency supports) are positioned at the highest level (4.57 and 4.52, respectively), followed by Theme 1 (contractors' external pressures and motivations, 4.35). Theme 2 (project features, 4.1) is placed at the third level. These values indicate the priorities for addressing the corresponding themes.

5.4. Measures Associated With Contractors' P-CSR Influencing Strategic Themes. According to the four contractors' P-CSR influencing factors' group, the measures are summarized in Table 7.

(1) Measures concerning national emergency supports. National emergency supports can significantly encourage P-CSR implementation. This support, which includes organizational, institutional, and financial assistance, has a direct impact on contractors' P-CSR implementation. Consequently, measures such as formulating strategic policies, providing funding support, and creating a learning database are proposed to address the influencing factors of national emergency support systems. Given the features of PDR projects, such as tight time frames, labor unavailability, and challenging supply chains, government execution efficiency impacts contractors' P-CSR implementation. Therefore, measures such as simplifying the approval process and allocating resources in a timely manner ensure smooth execution and consequently encourage contractors' P-CSR implementation. In addition, it will be beneficial for archiving CSR when CSR clauses are included in contracts appropriately among partners in PDR projects with the promotion of government.

(2) Measures concerning contractors' internal capabilities. The EFA results indicate that contractors' internal capabilities for disaster resilience can be influenced by management issues, such as the abilities and values of top-level managers, as well as their abilities in emergency and ordinary settings. Therefore, enhancing the contractors' internal capabilities can be achieved by addressing P-CSR disclosure, incorporating P-CSR into firms' core business strategies, and propagating P-CSR collectivism from a top management perspective. In addition, the EFA results suggest that technological ability affects internal capabilities. Therefore, improving contractors' innovative technologies and studying benchmark contractors can serve as alternative measures to enhance contractors' internal capabilities.

(3) Measures concerning contractors' external pressures and motivations. Although many incentive and punishment measures are mentioned in contractors' CSR implementation among ordinary projects, contractors' P-CSR implementation should focus on measures that are beneficial for contractors' long-term development resilience. Most contractors consider short-term economic benefits when contributing to disaster relief work and establishing resilient communities. For example, a strong track record of positive CSR practices serves as a prequalification for contractors to bid on future projects. The provision of effective financial services, low-cost bank loans, and tax incentives are all recognized as effective measures. Additionally, corporate reporting requirements that highlight firms' P-CSR performance are regarded as producing powerful compliance results. Employing legislation to align contractors'

Table 6: Rotated factor matrix of contractors' P-CSR influencing factors.

ID	Contractors' P-CSR influencing factors	Construct			
		1	2	3	4
II07	Government–firm relationship-driven	0.816	—	—	—
EI16	Market competition intensity	0.796	—	—	—
II08	Talents maintaining and absorbing	0.782	—	—	—
II09	Financial benefit driven	0.780	—	—	—
EI05	Reward and punishment mechanism	0.753	—	—	—
II10	Reputation driven	0.728	—	—	—
EI06	Supplier requirement	0.838	—	—	—
EI07	Customer expectations	0.709	—	—	—
EI19	Media and public attention	0.691	—	—	—
EI17	Benchmarking roles played by competitors	0.658	—	—	—
EI18	Organization and association initiatives	0.614	—	—	—
EI08	Resource availability	—	0.853	—	—
EI09	Climate and secondary disaster risk	—	0.833	—	—
EI10	Project stability	—	0.820	—	—
EI11	Contractual requirements	—	0.810	—	—
EI12	Reliability of financing source	—	0.795	—	—
EI13	Infrastructure condition	—	0.794	—	—
EI20	Local customs and culture	—	0.742	—	—
EI14	Project size	—	0.679	—	—
EI15	Project duration	—	0.668	—	—
II01	Firm's emergency management ability	—	—	0.844	—
II02	Firm's ordinary management ability	—	—	0.802	—
II03	Top managers' decision ability	—	—	0.788	—
II04	Firm's technological ability	—	—	0.732	—
II06	Employees' citizenship	—	—	0.703	—
II12	Top manager's values	—	—	0.704	—
II05	Firm's financial ability	—	—	0.645	—
EI01	National emergency organization support system	—	—	—	0.781
EI02	National emergency institution support system	—	—	—	0.780
EI03	National emergency fund support system	—	—	—	0.740
EI04	Government execution efficiency	—	—	—	0.730
Eigenvalue		15.317	3.832	2.032	1.372
Variance (%)		49.410	12.362	6.555	4.426
Cumulative variance (%)		49.410	61.772	68.326	72.752
Cronbach's α		0.956	0.935	0.939	0.932

CSR actions with government requirements is also known to be effective, in addition to the benefits of attracting relevant high-quality human resource skillsets.

(4) Measures concerning project features. In both regular and PDR projects, it is crucial to consider project characteristics and create emergency management plans for CSR implementation. However, under PDR circumstances, systemic management plans for occasional complex events need to be considered due to the fragility and vulnerability of the disaster environment. For example, enhancing effective communication among stakeholders could improve work efficiency, as could the application of innovative business technologies. High-quality ethical leadership is essential, as are core management teams with the capacity for flexible decision-making when dealing with various complex emergency management situations. It is preferable to employ local personnel and purchase local raw materials, as they not only directly benefit local communities but also facilitate the preservation of local culture and reduce the damage caused by disasters to mental health. Similarly, just as international contractors adjust to cultural differences between the host and home country, contractors should implement reconstruction activities under systems that reduce institutional and cultural distance.

6. Discussion

6.1. Contractors' P-CSR Implementation Strategies. The analyses revealed four major themes in contractors' P-CSR implementation. Based on the strength of the themes, four

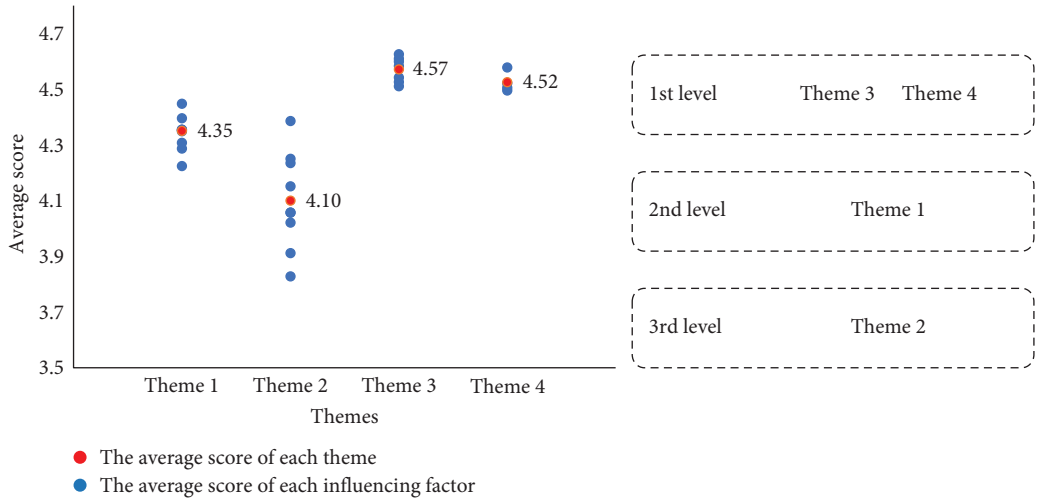

Figure 2: Three-level structured framework of strategic themes.

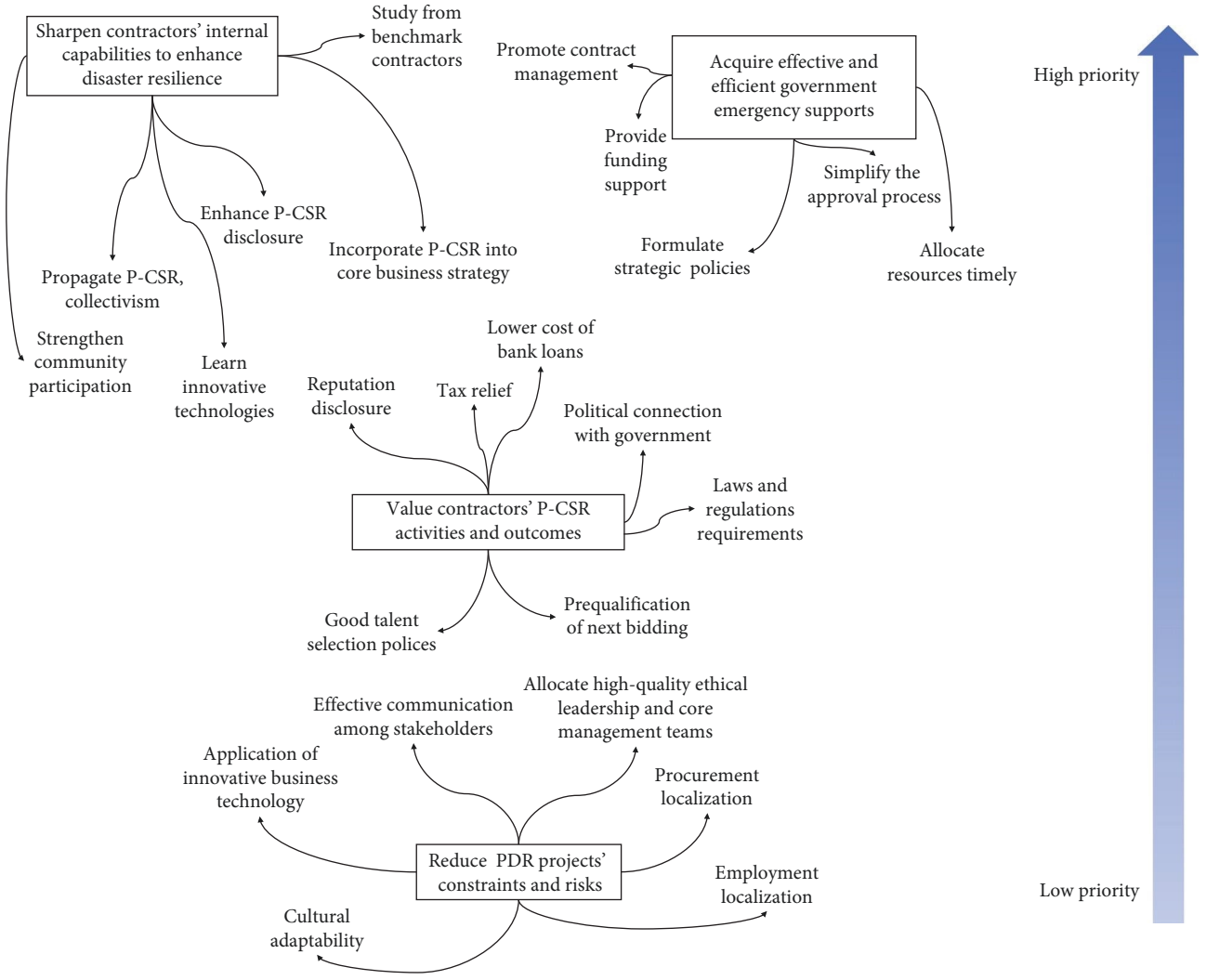

Figure 3: A Y-shaped framework of systemic contractors' P-CSR implementation.

Table 7: The implementation measures of contractors' P-CSR.

Strategic themes	Influencing factors	Measures	References
National emergency supports	National emergency organization support; National emergency institution support; National emergency fund support; Government execution efficiency	Create learning database; Provide funding support; Simplify the approval process; Allocate resources timely; Formulate strategic policies	[4, 5, 27, 32, 36, 40, 46]
Contractors' internal capabilities	Firm's emergency management ability; Firm's ordinary management ability; Top managers' decision ability; Firm's technological ability; Employees' citizenship; Top managers' value; Firm's financial ability	Propagate P-CSR, collectivism; Study from benchmark contractors; Strengthen Community participation; Learn innovative technologies; Incorporate P-CSR into core business strategy; Enhance P-CSR disclosure	[1, 12, 16, 20, 27, 29, 36, 40, 55, 62]
Contractors' external pressures and motivations	Government–firm relationship-driven; Market competition intensity; Talents maintaining and absorbing; Financial benefit driven; Reward and punishment mechanism; Reputation driven; Supplier requirement; Customer expectations; Media and public attention; Benchmarking roles played by competitors; Organization and associations initiatives	Reputation disclosure; Lower cost of bank loans; Political connection with government; Laws and regulations requirements; Prequalification of next bidding; Good talent selection policies; Tax relief	[15, 16, 27, 33, 36, 37, 42]
Project features	Resources availability; Climate and secondary disaster risk; Project stability; Contractual requirements; Reliability of financing source; Infrastructure condition; Local customs and culture; Project size; Project duration	Effective communication among stakeholders; Allocate high-quality ethical leadership and core management team; Employment localization; Procurement localization; Cultural adaptability; Application of innovative business technology	[1, 5, 12, 16, 39, 42, 46]

Table 8: Comparison of strategies developed in this study and those in existing literature.

Strategies developed in this study	Strategies proposed in the literature for China	Strategies derived from other countries or economies			
		New Zealand	Nepal	United States	Global research
Acquire effective and efficient national emergency supports	Coordinate the organization [14]	Local authorities' success [47]	Ensuring management by multiple levels [46]	Endorse CSR initiatives with different departments [36]	Strengthening national and local governance [4]
Sharpen contractors' internal capabilities to enhance disaster resilience	Firms' capabilities [37]	Noble purpose [40]	Community communication [5, 12]	Firms' dynamic capabilities [1]	Stakeholders' concern; business development; transnational culture [42]
Value contractors' P-CSR activities and outcomes	Open the press to CSR activities [10] Reputation [41]	External award and review best practice [40]	—	Reputation [36]	Exhibit a greater degree of CSR tangibility [68]
Reduce PDR projects' constraints and risks	Resource availability [49]	—	Local construction customs [5]	—	Local presence effect [68]

implementation strategies are recommended: (1) acquire effective and efficient national emergency supports, (2) sharpen contractors' internal capabilities to enhance disaster resilience, (3) value contractors' P-CSR activities and outcomes, and (4) reduce PDR projects' constraints and risks. These strategies align with the results of research conducted within the context of Chinese PDR [42], as well as those from other countries, such as Nepal [46], New Zealand [40], the United States [1], and globally [68]. For example, the proposed strategy for national and regional government emergency support systems addresses the post-disaster context, where Westoby, Wilkinson, and Dunn [46] advise "ensuring there is a process of regular supervision by multiple levels." The strategy to encourage the promotion of contractors' CSR activities and outcomes aligns with the findings of previous studies, such as the pledge of "quantifying the economic benefits and social benefits provided by CSR practices" [27, 32]. Walker, Vries, and Nilakant [40] add to this imperative, suggesting an external award and reviews of best practices. Contractors' capabilities are recommended by McKnight and Linnenluecke [1] in terms of "firms' dynamic capabilities." Table 8 provides a comparison of strategies as developed in this study and those in extant literature.

This study presents a comprehensive set of implementation strategies aimed at improving contractors' P-CSR. It compares these strategies with those found in international practices from Nepal, New Zealand, the United States, and global research. By comparison, some common strategic measures have been summarized in extremely complex PDR environments, including enhancing contractors' ability, governments' emergency supports, forming noble purposes, and increasing reward and punishment measures for contractors. This provides an important reference for scholars and stakeholders in China and worldwide in determining effective strategies to enhance contractors' P-CSR.

6.2. Y-Shape Framework of Contractors' P-CSR Implementation. Figure 2 displays the average scores for the four strategic themes, aiding in the categorization of influencing factors into a three-level structure. In line with the strategic themes, 24 measures were developed to facilitate and encourage contractors' P-CSR implementation. These measures and resultant strategies collectively form a Y-shaped framework, allowing for systemic P-CSR implementation based on the influencing factors (Figure 3).

The Y-shaped model presented in this study for contractors' P-CSR implementation stands out in CSR management compared with prior research. This Y-shaped model responds to PDR projects' complex and fragile characteristics. First, the strategies and measures embedded in this framework are supported by statistical evidence in the Chinese PDR context. Second, the Y-shaped framework indicates the priorities and requires systemic implementation of the strategies for maximized synergy, providing an ideal hone to understand P-CSR implementation. Third, the previous studies have emphasized single influencing parameters. However, it is essential to examine and analyze the influencing factors collectively and systemically, as demonstrated by the different priorities emphasized in this framework.

7. Conclusions

This study argues that PDR projects provide unique extreme environments that challenge contractors' resilience to adhere to form effective strategies for implementing CSR. This study adopted a mixed-methods design to examine determinants of CSR in the PDR projects. It identified and assessed 32 influencing factors, and four underlying constructs or generic strategies emerged: (1) acquire effective and efficient national emergency supports; (2) sharpen contractors' internal capabilities to enhance disaster resilience; (3) value contractors' P-CSR activities and outcomes; (4) reduce PDR projects' constraints and risks. Among these strategies, improving contractors' internal capabilities receives a high priority, indicating that contractors' dynamic capabilities effectively respond to the special extreme environment of PDR projects. Obtaining timely and effective government emergency support is the second important strategy because the implementation of P-CSR systems will be more effective within the framework of active disaster management plans established by the government. Moreover, due to the fragility and complexity of PDR environments, it is necessary to consider systemic management plans for occasional complex events to reduce PDR projects' constraints and risks, and P-CSR implementations should focus on measures that are conducive to the long-term development and resilience of contractors.

This study contributes to the literature by exploring how CSR is determined and what can be done to effectively implement CSR in the context of PDR projects facing extreme challenges. These generic strategies were found to differ from those employed in more typical and stable business and project environments. Given the increasing number of PDR projects due to climate change, this extension of the literature holds not only theoretical value but also practical implications. PDR project clients should recognize the importance of selecting contractors with a strong commitment to CSR; contractors can adopt some or all of these generic strategies to implement their CSR and survive under the extreme conditions of PDR; the government should also provide emergency support systems.

It could be interesting and valuable for future studies to look into whether these generic strategies can be applied to typical project environments. Additionally, as this study was conducted in the Chinese context, the systematic research design and some common strategic measures can be applied to different country environments facing increasing natural disasters due to climate change. However, this study acknowledges certain limitations. First, it is based on the basic characteristics of PDR projects, which weakens the differences among different project types. Second, the data sample size is relatively small, meaning that the research conclusions have certain limitations. Third, the study did not validate the relationships between the strategies and measures, which will be a topic for future research.

Data Availability Statement

Data are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

Author Contributions

Hongyan Zheng contributed to conceptualization. Igor Martek contributed to the writing—review and editing. Wenting Zhan contributed to the methodology. Chuan Chen contributed to the formal analysis. Jiawei Tian and Wenmei Zhou contributed to the investigation. Hongyan Zheng and Wenting Zhan contributed to the writing—original draft preparation.

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