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INFLUENCE OF INSTITUTIONAL PRESSURE ON MEGAPROJECT SOCIAL RESPONSIBILITY BEHAVIOR

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Abstract. To explore the law of megaproject social responsibility behavior (MSRB) among internal organizations under institutional pressure, this paper presents a theoretical and empirical study to investigate how institutional pressure affects MSRB through the mediating role of organizational social responsibility cognition and the mediating roles of the communication mechanism and relationship strength based on new institutional sociology. Based on a total of 147 responses from a broad questionnaire survey, structural equation modelling (SEM) was used to test the proposed hypotheses. The research results show that institutional pressure has a promoting effect on MSRB, and organizational social responsibility cognition mediates the relationship between institutional pressure and MSRB. Additionally, the communication mechanism and relationship strength have no effect on the relationship between institutional pressures and MSRB. The research results provide a new theoretical foundation for the analysis of MSRB and practical suggestions for policymakers on the governance of MSRB.

Keywords: megaproject social responsibility behavior (MSRB), social responsibility cognition, institutional pressure, communication mechanism.

Introduction

Nowadays, infrastructure projects, especially megaprojects, are playing a major role in the economic development of different countries, especially in Asia (Andrić et al., 2019). Global infrastructure construction is ushering in a new round of development opportunities (Pernille & Karyne, 2017; Zeng et al., 2018). The annual global investment in megaprojects around the world is around US$6–9 trillion, accounting for 8% of global GDP (Flyvbjerg, 2014). According to McKinsey & Company, the investment in infrastructure projects will increase to US$57 trillion globally by 2030 (Zeng et al., 2018).

Megaprojects refer to large public projects that involve multiple stakeholders, play a major role in the economic development (Andrić et al., 2019; Zhang et al., 2021), and have a profound impact on society (Kim, 2010; Wang et al., 2019; Wang et al., 2020b; Yang et al., 2018). Megaprojects are mainly classified into infrastructure projects and urban group projects (Giezen et al., 2013). The rapid pace of urbanization has created a huge demand for megaprojects in developing countries (Yun et al., 2020). As a country that has implemented numerous megaprojects and increasingly pays attention to sustainable development of megaprojects, China has made impressive achievements in the field of megaproject construction in recent years (Zhai et al., 2017). According to Yun et al. (2020), megaproject is defined as a large-scale public project with a total investment higher than the 0.01 percent of GDP, a complex technology system, a strategic significance, andas well a s a profound social influence. According to Wan et al. (2020), megaproject refers to a large-scale and multibillion-dollar infrastructure project commissioned by a government. In China, megaprojects are usually proposed or led by the government and refer to projects with a large scale, long implementation periods, and complex stakeholders, which are of strategic importance to the development of society and the country. In recent years, China has successfully implemented numerous megaprojects (Zhai et al., 2017), such as the Three Gorges Project, the South-to-North

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Water Transfer, the Qinghai-Tibet Railway, and the Hong Kong-Zhuhai-Macao Bridge, achieving several "wonders of the world" one after another.

As megaprojects have a tremendous impact on society, the economy, and environment (Wang et al., 2017a; Zeng et al., 2018), their sustainable development has attracted great attention from various sources (e.g., He et al., 2019; Wang et al., 2020a). Megaproject social responsibility (MSR) refers to the responsibility that megaprojects' stakeholders need to fulfill so as to transparently and ethically conduct their decisions and activities through the whole project life-cycle (Zeng et al., 2015). Social responsibility is important for achieving the sustainability of megaprojects (Zeng et al., 2015), improving the social benefits of megaprojects (Flyvbjerg, 2014), and promoting social and economic development (Carole et al., 2014; Zhao et al., 2015). In addition, MSR is undoubtedly one of the important value elements for evaluating the success of engineering projects (Turner & Zolin, 2012).

The implementation of MSR is closely related to the behavior of various stakeholders, and the successful implementation of MSR requires close cooperation between all parties over the whole project life-cycle (Lin et al., 2017). The stakeholders are the participating entities in the implementation of organizational social responsibility, and their decisions and activities have an important impact on the implementation of MSR. For example, the green construction behavior of construction companies can help reach organizational environmental responsibility objectives. It is thus important for project teams to manage stakeholders in megaprojects (Yang et al., 2018).

However, at present, there is a lack of effective measures for the management of stakeholders' social responsibilities in megaprojects, resulting in such frequent problems as engineering accidents and casualties caused by builders' production safety negligence (Ma et al., 2017; Xue et al., 2015), NGO protests, employee strikes, social conflicts, and even project termination caused by a weak awareness of community responsibility of the management party (Lee et al., 2017).

Institutional pressures formed by laws, regulations, and contracts can promote stakeholders' performance of MSR. Makino (2002) believes that institutional environment forms a kind of pressure on the survival of enterprises, and that institutional pressure, to some extent, will restrain enterprises' social responsibility behavior (Feng, 2018). Institutional pressure refers to the forces of rules, norms, social concepts, or cultures that make the form, structure, or behavior of enterprises tend to be reasonable, easily recognized, and supported (Wang et al., 2008). Institutional pressure includes regulatory pressure, normative pressure, and cultural cognitive pressure (Scott, 2010). At present, given that most stakeholders in China have not paid enough attention to MSR, it is normally the quickest and most effective way for the government to improve this through laws and regulations, construction standards, or bidding documents and contracts.

At present, most studies examine the effect of institutional pressure on the implementation of social responsibility in a single corporate. For example, Li's et al. (2019a) regression analysis shows that institutional pressure is a driving factor on corporate social responsibility, and Xie et al. (2017b) found that a good institutional environment can strengthen corporate social responsibility. Yu (2014) also opined that institutional pressure, as the external environment, plays a significant role in promoting corporate social responsibility based on new institutional theory.

However, megaprojects, as temporary organizations, consist of several companies (Xie et al., 2018), which form a network of close contacts. Institutional pressure is regarded as an important external influencing factor for megaproject social responsibility behavior (MSRB) (Wang et al., 2018). MSRB refers to the actions taken by stakeholders to deal with social responsibility issues (Xie et al., 2019). Existing research reveals that institutional pressure affects the performance of social responsibility by influencing the characteristics of management (Feng & Rong, 2016), and institutional pressure can also affect the implementation of social responsibility by increasing managers' attention to social responsibility (Yu & Liu, 2015). However, it is unclear how institutional pressures spread across various organizations in a megaproject and affect MSRB as a whole. Therefore, this article answers the question of how institutional pressure affects MSRB, focusing on the MSRB of internal organizations under institutional pressure.

1. Theoretical background and research hypotheses

1.1. MSR and MSRB

MSR involves economic, legal, environmental, political, and ethical responsibility. Economic responsibility means that megaprojects should provide valuable facilities and services to society (Korytárová & Hromádka, 2014). As Velásquez (2012) point out, legal responsibility means that construction projects must meet the requirements of laws and regulations, which is also the most basic social responsibility (Zeng et al., 2015). Environmental responsibility means that construction activities should not be at the expense of ecological stability. In addition, Lichtenstein et al. (2013) emphasized the importance of environmental protection in construction. Ethical responsibility mainly includes occupational health and safety (Velásquez, 2012), taking care of special employees (such as migrant workers and disabled people), and other responsibilities related to employees. As megaprojects usually involve government departments, political responsibility aims to provide public services and, more importantly, promote social stability and fairness (Orji & Awortu, 2015). Megaprojects can increase employment, improve the physical and mental health of community residents, and increase the public's happiness so as to promote social stability and progress, especially in China (Zeng et al., 2015). Moreover, major

infrastructure projects play an important role in eradicating local poverty and in solving immigration problems (Fincher, 1997).

Based on the Social Action Theory of Talcott Parsons, the present study defines MSRB as the behavior that multiple heterogeneous actors in megaprojects choose to adopt to fulfill their social responsibility in the context of complex influencing factors, and the process of their interactions through the whole project life-cycle. As MSR is jointly completed by the organizations that formally participate in project construction, the MSRB is essentially the social responsibility behavior of those participating organizations. According to Social Action Theory, social action is an activity carried out by actors using specific means to achieve their goals, which is subject to the conditions surrounding the action, the values of actors, social norms, etc. Behavior has multiple dimensions, including behavioral performance and behavioral strategies. Behavioral performance focuses on what the organization does, while behavioral strategies pay more attention to how the organization does it. The present study focuses on "the performance of MSRB".

Over the last decade, an increasing number of construction firms from China have entered the international market (Pheng & Hongbin, 2003). In particular, the Belt and Road Initiative (BRI) has galvanized the international market (Zhou et al., 2017) and accelerated the Chinese construction enterprises to participating in the construction of megaprojects globally, such as the A2 highway in Poland. This increasing internationalization requires megaproject participants to pay more attention to their MSR performance (Xie et al., 2020).

Different from corporate social responsibility behavior, the heterogeneity, interactivity, and complexity of participants make the influencing factors of MSRB much more complicated. These can be roughly divided into internal influencing factors and external influencing factors. The internal influencing factors include the characteristics of participants, such as their internationalization level (Ma et al., 2016), industry status (Cambra-Fierro et al., 2013), leadership (Wang et al., 2017b), and CEO narcissism (Lin et al., 2018). The project culture can also affect the implementation of social responsibility. External influencing factors include external stakeholder pressure, external appeal, and institutional environment. The external stakeholders represented by non-governmental organizations are increasingly concerned about (and demanding) the social responsibility of projects (Winch & Bonke, 2002). Improper social responsibility behavior has a negative impact on the project (Brockman, 2014). Xie et al. (2019) found that external appeal has a positive impact on hypocritical MSRB. The external institutional environment in which a project is located also affects social responsibility behavior. A good institutional environment can promote the adoption of social responsibility (Xie et al., 2017a).

In contrast with traditional construction projects, megaprojects are more closely associated with socioeconomic systems. Thus, their impact surpasses the project level to a higher and wider organization field (Li et al., 2019b). The course of megaprojects' decision making, planning, management, and coordination reflects the interaction between multiple actors with different conflicts of interests and are influenced by politics, the economy, and institutions. Megaprojects are not isolated islands: their huge social impact makes the decision making and implementation of a megaproject happen under an open social environment, making a megaproject a complex organizational field (Li et al., 2019b). Therefore, research into MSRB should take full account of its organizational field background. As new institutional sociology emphasizes the analysis of participants' behavior in the context of an organizational field (Hoffman, 1999), it is appropriate to apply new institutional sociology to study MSRB.

Institutional theory is widely recognized as a powerful theoretical framework and has been widely applied to explore a range of research topics, such as the internationalization progress of higher education (Alsharari, 2019), changes in management accounting (Burns & Scapens, 2000), and inter-organizational relationships (Rozenfeld & Scapens, 2021). According to new institutionalism theory, institutional pressure – composed of regularization, normativeness, and culture-cognition – affects organizational behavior (Scott, 2010). Institutional pressure includes not only laws and regulations, but also stakeholder pressure and project cultural pressure. While new institutionalism theory considers the external environment of megaproject participants, it ignores the characteristics of megaproject participants. Many studies point out that the organization's reflection and judgment on institutional pressure depends on the characteristics of the organization itself and its social responsibility cognition. For example, Liu and Wang (2016) found that actors choose the most suitable CSR behavioral measure for themselves according to their own position in the environment and their understanding of the environment. In addition, Powell and DiMaggio (1991) believe that the impact of institutional pressure on actors is influenced by the media of communication and proliferation: the transmission of institutional information affects the understanding, interpretation, and acceptance of the receiver (Scott, 2010). Through the above analysis, it is easy to see that the impact of institutional pressure on MSRB is restricted by the participants' own social responsibility cognition and communication mechanism (CM). Therefore, the present study focuses on how institutional pressure affects MSRB, with the role of social responsibility cognition and CMs taken into consideration.

1.2. Effects of institutional pressure on MSRB

Institutional pressure (IP) is an important external influence factor affecting MSRB (Wang et al., 2018). Institutional pressure, also named "the institutional environment", refers to social concepts, rules, norms, or cultures that promote the formation, structure, and behavior of a company to be reasonable, acceptable, and supported

(Shen, 2010). Institutional pressure drives megaproject construction enterprises (stakeholders) to take more responsibility and pay more attention to the impact of their decisions or activities on society.

According to new institutionalist theory, institutional pressure includes the three basic elements of regularization, normativeness, and culture-cognition (Scott, 2010), and good institutional pressure can promote social responsibility. Table 1 shows some specific examples that form institutional pressures. Of these, regularization usually refers to the adoption of such mandatory means as laws, regulations, rules, and systems to achieve particular purposes, and the regulatory pressures in the engineering field mainly include government regulations, legal systems, government supervision, industry norms, and engineering-related legal provisions. Hart and Saunders (1998) have shown that mandatory pressure can significantly promote corporate social responsibility behavior. If enterprises violate the system norms, they may lose some of their legitimacy, reduce their reputation in the industry, and even threaten their own economic benefits (Mezias, 1990). Legitimacy refers to the extent to which organizational behavior is accepted by stakeholders based on current social norms and values (Suchman, 1995). Normative pressure mainly refers to the external environment restricting organizational behavior through values and norms, but it can also refer to the expectation of organizational behavior in the organization's environment (thinking or hoping that the organization does something specific in some way) that creates behavioral pressure on the organization. Largely due to ethical and moral attributes and altruism in social responsibility, in addition to government and public policies, the external public and media can play an effective role in promoting the company without the company's voluntary participation and preventing the disguised behavior of enterprises (Wang et al., 2018). Culture cognitive pressure mainly refers to the cultural influence of the external environment on corporate cognition, so that enterprises can adopt similar behaviors independently, mainly referring to the behavior of enterprises imitating organizations that are recognized by themselves. For instance, when leading enterprises in the industry have good social responsibility performance, other enterprises will be forced to imitate their behavior due to competitive pressures. In addition, Liu and Wang (2016) also found similarities in social responsibility between companies with relatively close links; their behaviors were in line with the behavior of core companies (Chen et al., 2018). Wang et al. (2018) found that, compared with regulatory pressure and normative pressure, the impact of imitation pressure on the megaproject organizational behavior is more significant. Based on the above analysis, we propose the following hypotheses:

Table 1. Examples of the institutional pressures

Pressure type		Examples
Institutional pressures	Regulatory pressure	Regulations of the People's Republic of China on the Implementation of Bidding Law Environmental law of the People's Republic of China International Federation of Consulting Engineers
	Normative pressure	Qualification and Grade Appraisal of Construction Association Green rating of environmental associations
	Cultural cognitive pressure	The atmosphere of fulfilling social responsibility in construction industry

H_1: *Institutional pressure is positively correlated with MSRB.*

H_{1a}: *Regulatory pressure is positively correlated with MSRB.*

H_{1b}: *Normative pressure is positively correlated with MSRB.*

H_{1c}: *Cultural cognitive pressure is positively correlated with MSRB.*

Although institutional pressure can have an impact on MSRB, it is important to note that institutional elements, whether they are regulation, norms, or culture-cognition, need to be transmitted and diffused. The information "deliverer", and the way of transmission, will affect the recipient's understanding, interpretation, and acceptance of it. In other words, the action mechanism of institutional pressure on the actor will be affected by the media of transmission and diffusion.

1.3. Institutional pressure affects MSRB through social responsibility cognition

Organizational social responsibility cognition mediates the effect of institutional pressure on social responsibility behavior. The institution acts on the actor of social responsibility behavior and influences the participants to adopt social responsibility. However, the behavioral actor's own social responsibility cognition is different, which leads to a difference in the adoption of social responsibility behavior. Some studies point out that the characteristics of enterprises affect the social responsibility of enterprises, and the organization's reflection and judgment on institutional pressure depends on the characteristics of the organization itself and its social responsibility cognition. For example, industry leaders are often more active in fulfilling social responsibility (Cambra-Fierro et al., 2013), and a high level of internationalization normally means having a good CSR performance (Orji & Awortu, 2015; Othman & Abdellatif, 2011; Stone, 2008). "Cognition" is usually a unique attribute at the individual level that reflects the decision maker's perception of social responsibility (Aguinis & Glavas, 2012; Lin et al., 2018). Similarly, if we treat the organization as a complete individual (e.g., a construction unit), the social performance behavior of each "individual" in megaprojects is influenced positively by its social responsibility cognition.

The participants have particular perception and ability to understand – existing in the environment and being subject to the environment – and they can also under-

stand and choose according to their own situations (Giddens, 1979, 1986). Social responsibility behavior, as well as social responsibility cognition, is influenced by three institutional pressures of regulation, normativeness, and culture-cognition. For example, institutional pressures influence the firm's strategic cognition, thus affecting ambidextrous innovation (Song & Zhao, 2021). The institutional pressure largely impacts on its own social responsibility cognition.

Organizations involved in megaprojects face two levels of social responsibility: the project and the organization itself (Lin et al., 2018). The social responsibility of the organization itself is different from the social responsibility of the project itself, and the focus of the present study is the social responsibility behavior adopted by the organization in the project dimension. A project is a temporary organization that allocates inputs of MSRB into the project according to the characteristics of the project and its own ability. The organization is permanent, and the corresponding organizational social responsibility is part of the organizational culture and strategy. It is relatively stable and represents the level of organizational social responsibility cognition. Therefore, this study regards the performance of organizational social responsibility as the level of organizational social responsibility cognition. Organizations that attach more importance to social responsibility are more sensitive to the requirements of social responsibility in the surrounding pressure. It is easier for organizations to receive the requirements of institutional pressure in the project, and the organizations are more likely to do this for their own social responsibility behavior to improve their own social responsibility cognition. Consequently, we propose:

H_2: *Organizational social responsibility cognition* (*SRC*) *mediates the relationship between institutional pressure and MSRB.*

1.4. Effects of the communication relationship and relationship strength on MSRB

The CM can affect the effect of institutional pressure on behavior. A megaproject is a temporary organization field (Xie et al., 2018), and the institutional environment is an important behavior code of the organization. The disseminator and mode of information can affect the understanding, interpretation, and acceptance of the recipient (Scott, 2010). The impact of institutional pressure on actors is influenced by the media of communication and proliferation (Powell & DiMaggio, 1991). In megaprojects, the temporary project team relies on effective communication to quickly and clearly understand each other's views and intentions, clarifying rights, responsibilities, and interests (Powell & DiMaggio, 1991), and promoting a consensus and collaboration to complete tasks. Communication is a two-way process that requires information sharing and exchange of thoughts and feelings (DeSanctis & Monge, 2010): it is important for the spread of institutional pressure in the project and the interaction of agents' behaviors. The process and results of agent communication affect the relationship between institutional pressure and MSRB. Smooth information sharing and communication between participants enables the government's will, community, and public expectations, and the behavioral orientation of other organizations in the same industry to be delivered quickly and accurately – improving the transmission effect of social responsibility concepts and behaviors. Consequently, the CM is necessary when communicating and spreading social responsibility between organizational networks (Chen et al., 2018). Therefore, we propose:

H_3: *CM positively moderates the relationship between IP and MSRB.*

The communication methods between major project organizations include formal CMs and social networks among stakeholders. Through such formal CMs as joint offices, conferences, and information platforms, project teams can collect, analyze, and communicate information in a timely manner; quickly understand the status of the project; and make appropriate and timely decisions (Wu et al., 2017). The timeliness, accuracy, completeness, and adequacy of information exchange are recognized standards to measure communication quality (Cigrang et al., 2014), and are used to measure the level of CM in the present study.

The frequency and intensity of communication between organizations affects the effect of institutional pressure on social responsibility behavior. In contrast with corporate social responsibility, engineering social responsibility cannot be realized by only one enterprise or organization. In the megaproject of multi-agent close interaction and interdependence, the influence of enterprise behavior and various factors on the enterprise is regulated by the engineering network. CM reflects the communication mode between organizations under the formal organizational structure, while the social network represents the actual behavior patterns and work practices between organizations (Powell & DiMaggio, 1991). The megaproject stakeholder network reflects the interaction patterns between internal and external stakeholders, provides tools for IP diffusion, offers a path for the dissemination of MSR, and promotes the similarity of socially responsible behavior among enterprises (Liu & Wang, 2016).

When the frequency of exchanges between organizations increases, institutional pressure will spread more rapidly in the organization, thus promoting its effect. In this research, the frequency of interactions and degree of influence is measured by inter-organizational relationship strength (RS). Therefore, we propose:

H_4: *RS positively moderates the relationship between IP and MSRB.*

There are frequent exchanges between organizations, and the organization's cognition of social responsibility affects each other in the process of communication. At the same time, the greater the influence of the party with high social responsibility cognition, the higher is the trust

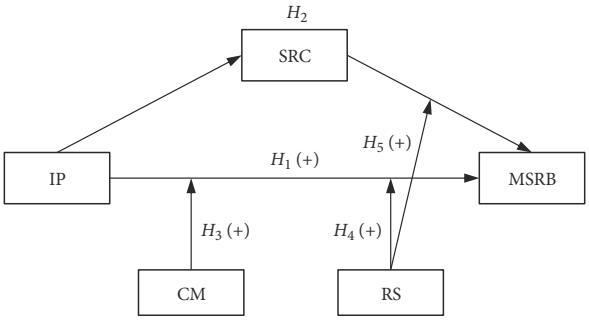

Figure 1. Conceptual model of MSRB rules

from other organizations, and thus they are more likely to imitate its behavior. Therefore, we propose:

H_5: RS positively regulates the mediating effect of SRC between IP and MSRB.

Figure 1 shows the conceptual model of the relationships between IP, CM, RS, SRC, and MSRB.

2. Methodology

2.1. Data collection and processing

This study is conducted in China, mainly because China is experiencing its "biggest infrastructure investment boom" in recent years (Ansar et al., 2016). Of the world's 30 most impressive megaprojects, more than a quarter are in China (Li, 2018; Yun et al., 2020). Qianhai is the core area of Shenzhen, one of the four first-tier cities in China, covering an area of 14.92 km^2 with a scale of 2600–3000 m^2 and a planned employment population of 650,000. It holds an important position connecting Shenzhen and Hong Kong, and is also an important place connecting Chinese mainland with the world. The planned investment in the Shenzhen-Qianhai district construction project is over CNY 1 billion (approximately USD 156 million), and its construction is of great strategic significance to China's economic and social development. The project includes housing, roads, tunnels, and many other types of facilities, and involves many overseas construction companies. It is a typical and representative group megaproject in China and therefore provides a suitable case for the study of MSRB.

A broad questionnaire survey was used for data collection. The questionnaire used a Likert-5 scale from 1 (totally inconsistent) to 5 (totally consistent) to measure the selected constructs. The measurement items of MSRB were adapted from Lin et al. (2017), which captured three participating entities' MSRB, including project owner, construction company, and supervision company. To measure CM, we mainly referred to Wu et al. (2017) and used a total of five measurement items. Based on Wang et al. (2018) and Yu (2014), the measurement of IP consists of 13 items, including 4 for regulatory pressure, 5 for normative pressure, and 4 for cultural cognitive pressure. The SRC measurement was adopted from Lin et al. (2017), using a total of 9 items. The measures used for the RS were based on Granovetter (1973) and Autry and Golicic (2010), including communication frequency and degree of influence. The Appendix contains details of the questionnaire.

After the questionnaire development, random sampling was used to select the target respondents. 11 construction sites were selected and the questionnaire was randomly distributed to a total of 196 megaproject managers working on the sites: these include owner, contractor, and supervisor to ensure their reasonable representativeness in MSR practices. In addition, to improve the effectiveness and accuracy of the survey data, the research team entrusted the Guangzhou Municipal Housing and Urban-Rural Development Bureau to issue a government

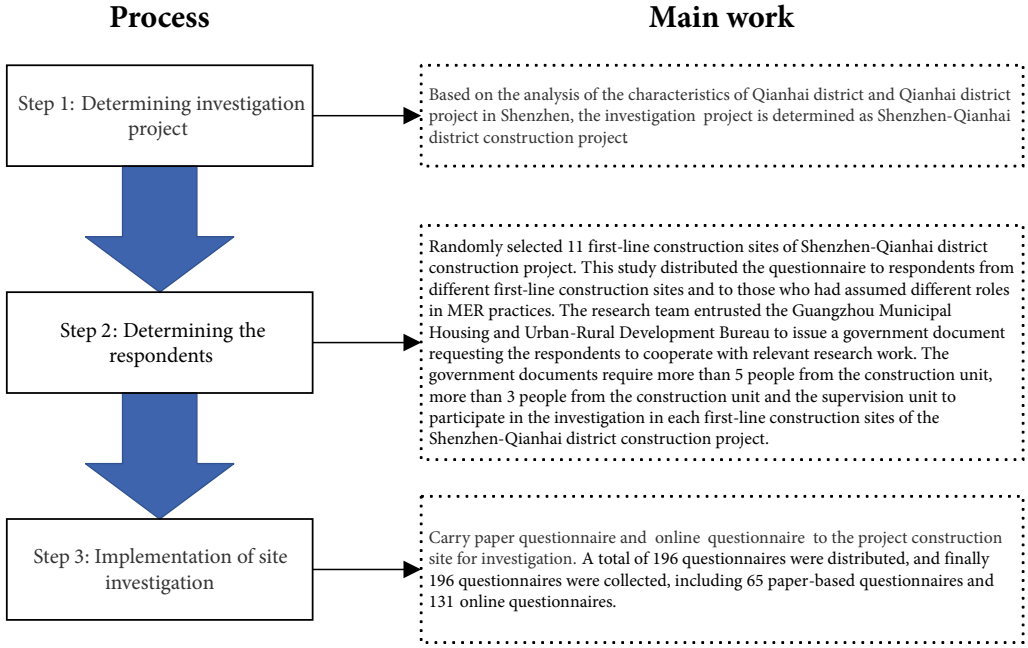

Figure 2. Survey procedures

document encouraging the respondents to cooperate with the study. Finally, the members of the research group carried the government document construction sites to conduct on-the-spot visits and surveys. The questionnaires were completed by either an on-site paper version or online questionnaire using the online questionnaire platform Questionnaire Star. The respondents were asked to complete the questionnaire based on the megaproject on which they were working. Figure 2 shows the three steps in the survey process.

All 196 questionnaires were collected, comprising 65 paper-based questionnaires and 131 electronic questionnaires. Those less than 90% complete, with same answers to more than 80% of the questions, or obviously randomly answered were deleted. This left 147 valid questionnaires remaining: an effective response rate of 75%.

2.2. Data analysis method

The data analysis is by multiple regression: this is a statistical method to establish the quantitative relationships between multiple variables in linear or non-linear mathematical models. Here it is used to explore the relationship between institutional pressure (comprising regulatory pressure, normative pressure, cultural cognitive pressure), organizational social responsibility cognition and MSRB, and, more specifically, verifying the mediating effect of social responsibility cognition between institutional pressure and MSRB, verifying the moderating effect of CM and relationship strength between institutional pressure and MSRB, and verifying the moderating effect of relationship strength between social responsibility cognition and MSRB.

Reliability refers to the degree of consistency of results obtained by repeated measurements on the same respondent in the same way. Here, Cronbach α coefficient is used for reliability analysis. Validity refers to the extent to which analytical measurement tools or means can accurately measure the things to be measured. The measurement scale used is universally acknowledged and mature in the field of MSR currently. Before the formal investigation, a pre-investigation was carried out, and some items that failed in the reliability and validity verification were deleted before the final questionnaire was obtained and the reliability and validity of the questionnaire were proved.

Multicollinearity is mainly tested by the coefficient of tolerance and variance inflation factor (VIF) of regression model, where VIF is the reciprocal of tolerance. Theoretically, when VIF ≥ 10, the model has serious multicollinearity; the closer the VIF is to 1, the weaker the multicollinearity is (O'brien, 2007).

3. Analysis and results

3.1. Descriptive statistical analysis

The 147 valid questionnaires are mainly from managers with management experience of megaproject construction work. Table 2 shows the respondents' profile information, indicating that the majority are from state-owned enterprises (70.7%), construction companies (75.1%), and have an undergraduate degree and above (62.6%). The male to female ratio is approximately 14:1, which is consistent with the general male dominance in construction projects, especially in construction sites. The number of managers accounts for 88.4%, of which 58.5% were junior managers and 26.5% were middle and senior managers; 66.0% have been working more than 5 years and 32.0% over 10 years. These are reasonable representatives of the situation in China.

3.2. Reliability analysis

As shown in Table 3, the Cronbach α coefficients of each measurement dimension are higher than the acceptability criterion of 0.7 (Hair et al., 2014), indicating the results have high stability.

3.3. Test for multicollinearity

Table 4 shows the results of the multicollinearity tests, indicating that the VIF values of all independent variables are less than 10 and, therefore, there are no multicollinearity relationships between the independent variables.

Table 2. Respondents profile information

Variable	Category	Number	Proportion (%)	Variable	Category	Number	Proportion (%)
Organizational roles	Project owner	34	23.1	Organizational ownership	State owned	104	70.7
	Construction company	84	57.1		Private owned	39	26.5
	Supervision company	29	19.1		Foreign owned	4	2.8
Education	High school and below	17	11.6	Gender	Male	137	93.2
	Junior college degree	38	25.9		Female	10	6.8
	Undergraduate	78	53.1	Working years	Less than 5 years	50	34.0
	Master's degree and above	14	9.5		6–10 years	50	34.0
Position	Grassroots managers	86	58.5		11–15 years	13	8.8
	Middle managers	39	26.5		16–20 years	14	9.5
	Top managers	5	3.4		More than 20 years	20	13.6
	Others	17	11.6				

Table 3. Reliability analysis results

Variable	Cronbach α	Number of questions
Social responsibility behavior of owner unit	0.925	8
Social responsibility behavior of construction unit	0.924	9
Social responsibility behavior of supervision unit	0.909	7
Regulatory pressure	0.927	4
Normative pressure	0.899	5
Cultural cognitive pressure	0.919	4
Information communication mechanism	0.947	5
Organizational social responsibility cognition	0.931	9
Communication frequency	0.916	15
Degree of influence	0.910	15

Table 4. Results of the multicollinearity test

Model	Collinearity statistics	
	Tolerance	VIF
Institutional pressure (*IP*)	0.262	3.820
Social responsibility cognition (*SRC*)	0.476	2.099
Communication mechanism (*CM*)	0.365	2.736
Relationship strength (*RS*)	0.913	1.095

3.4. Multiple regression analysis

3.4.1. Influence of institutional pressure on MSRB

Firstly, the control variables of Project ID, Organizational roles, and Organizational ownership are placed into regression Model 1 with the MSRB as the dependent variable (as shown in Table 5). Project ID refers to the 11 different construction sites; Organization roles are project owner, construction company, and supervision company; and Organization ownership comprises state-owned, private-owned and foreign-owned organizations. The results show there is no significant correlation between the control variables and MSRB, indicating that the differences in MSRB of organizations are not affected by Project ID, Organizational roles, or Organizational ownership.

Secondly, institutional pressure is added into the regression model (Model 2). As shown in Table 6, institutional pressure is significantly positively correlated with MSRB ($b = 0.627$, $p = 0.000 < 0.05$), so H_1 is not rejected. In order to further examine the role of the three dimensions (regulatory pressure, normative pressure, cultural cognitive pressure) in institutional pressure, the three variables are added into the regression model (Model 2a). The results show that only regulatory pressure has a significant (positive) effect on MSRB ($b = 0.311$, $p = 0.002 < 0.05$). The most likely reason is that the development of social responsibility of megaprojects in China is still at the initial stage, with the public and organizations themselves having no clear understanding of the social responsibility of projects. As a result, the implementation of social responsibility in megaprojects mainly relies on the government's mandatory requirements.

Table 5. Regression results for Model 1

Mode l	Variable	Regression coefficient (*P* value)
Model 1	Project ID	–0.013 (0.602)
$R^2 = -0.017$	Organizational roles	–0.063 (0.950)
$F = 0.182$ (0.908)	Organizational ownership	0.184 (0.854)

Note: Intercept coefficient (Model 1) = 4.602.

Table 6. Regression results for Model 2

Variable/Model	Model 2 Regression coefficient (*P* value)	Model 2a Regression coefficient (*P* value)
Institutional pressure	0.623 (0.000)	
Regulatory pressure		0.311 (0.002)
Normative pressure		0.218 (0.132)
Cultural cognitive pressure		0.108 (0.227)
Project ID	–0.003 (0.890)	–0.004 (0.860)
Organizational roles	–0.090 (0.190)	–0.109 (0.121)
Organizational ownership	–0.074 (0.445)	–0.701 (0.464)
R^2	0.374	0.375
F	22.826 (0.000)	15.630 (0.000)

Note: Intercept coefficient (Model 2) = 1.662, Intercept coefficient (Model 2a) = 1.523.

3.4.2. Influence of organizational social responsibility cognition on MSRB

In order to further test the mediating effect of organizational social responsibility cognition in MSRB, a three-step analysis is needed. The first step is to test the impact of institutional pressure on MSRB, and the Model 2 test has passed ($b = 0.623$, $p = 0.000 < 0.05$). The second step is to test the impact of institutional pressure on social responsibility cognition (Model 3), and the Table 7 results show that institutional pressure has a significant impact on organizational social responsibility cognition ($b = 0.632$, $P = 0.000 < 0.05$). The third step is to test the influence of institutional pressure and social responsibility cognition on MSRB (Model 3a). The Table 7 results show that the influence of institutional pressure on MSRB is not significant ($b = 0.147$, $p = 0.057$), the regression coefficient being reduced from 0.623 in Model 3. However, the influence of organizational social responsibility cognition on MSRB is significant ($b = 0.753$, $p = 0.000 < 0.05$). Therefore, H_2 also cannot be rejected.

Table 7. Regression results for Model 3

Variable/Model	Model 3 Regression coefficient (*P* value)	Model 3a Regression coefficient (*P* value)
Institutional pressure	0.632 (0.000)	0.147 (0.057)
Social responsibility cognition		0.753 (0.000)
Project ID	0.008 (0.625)	–0.008 (0.598)
Organizational roles	–0.066 (0.218)	0.140 (0.013)
Organizational ownership	–0.098 (0.199)	0.000 (0.996)
R^2	0.522	0.589
F	0.811 (0.000)	42.927 (0.000)

Note: Intercept coefficient (Model 3) = 2.138, Intercept coefficient (Model 3a) = 0.052.

Table 8. Regression results for Model 4

Variable/Model	Model 4 Regression coefficient (*P* value)	Model 4a Regression coefficient (*P* value)
Institutional pressure	0.681 (0.000)	0.657 (0.000)
Communication mechanism	–0.063 (0.513)	–0.087 (0.387)
Communication mechanism X Institutional pressure		–0.043 (0.414)
Project ID	0.000 (0.994)	0.002 (0.921)
Organizational roles	0.096 (0.165)	0.099 (0.155)
Organizational ownership	–0.080 (0.415)	0.08 9(0.366)
R^2	0.372	0.370
F	18.273 (0.000)	15.304 (0.000)

Note: Intercept coefficient (Model 4) = 1.660, Intercept coefficient (Model 4a) = 1.896.

3.4.3. Influence of CM on MSRB

In order to test the adjustment function of the information CM, the cross-term of the CM and the institutional pressure is introduced into Model 4a. To avoid multicollinearity, the "CM" and Institutional pressure variables are centralized and then multiplied. The Table 8 results show that the CM has no significant moderating effect on the relationship between institutional pressure and MSRB ($b = –0.043$, $p = 0.414 > 0.05$), and there is almost no change in R^2 and significance between Model 4 and Model 4a. H_3 is therefore rejected.

3.4.4. Influence of relationship strength on MSRB

In order to test the moderating effect of relationship strength on the relationship between institutional pressure and MSRB, institutional pressure, relationship strength, and their cross-term are introduced into Model 5a. To avoid multiple collinearity, this time the Institutional pressure and Relationship strength variables are centralized and multiplied. The Table 9 results show that the regulatory effect of relationship intensity on the relationship between institutional pressure and MSRB is also not significant ($b = 0.006$, $p = 0.708$), with little change in R^2 and significance between Models 5 and 5a. Therefore, H_4 is also rejected.

To test the moderating effect of relationship strength on the relationship between organizational social responsibility cognition and MSRB, Social responsibility cognition, Relationship strength, and their cross-term are introduced into Model 6a. To avoid multiple collinearity problems, this time the Social responsibility cognition and Relationship strength variables are centralized and multiplied. The Table 10 results show that the regulatory effect of relationship strength on the relationship between organizational social responsibility cognition and MSRB is again not significant ($b = 0.000$, $p = 0.990 > 0.05$), with little change in R^2 and significance between Model 6 and Model 6a. Therefore, H_5 is rejected too.

Table 9. Regression results for Model 5

Variable/Model	Model 5 Regression coefficient (*P* value)	Model 5a Regression coefficient (*P* value)
Institutional pressure	0.622 (0.000)	0.630 (0.000)
Relationship strength	0.001 (0.997)	–0.001 (0.956)
Relationship strength X Institutional pressure		0.006 (0.708)
Project ID	–0.003 (0.891)	–0.004 (0.836)
Organizational roles	0.090 (0.193)	0.089 (0.197)
Organizational ownership	0.074 (0.453)	0.070 (0.482)
R^2	0.370	0.366
F	19.132 (0.000)	15.042 (0.000)

Note: Intercept coefficient (Model 5) =1.662, Intercept coefficient (Model 5a) = 1.633.

Table 10. Regression results for Model 6

Variable/Model	Model 6 Regression coefficient (*P* value)	Model 6a Regression coefficient (*P* value)
Social responsibility cognition	0.875 (0.000)	0.875 (0.000)
Relationship strength	–0.001 (0.892)	–0.001 (0.893)
Social responsibility cognition X Relationship strength		0.000 (0.990)
Project ID	–0.011 (0.515)	–0.011 (0.519)
Organizational roles	0.137 (0.016)	0.137 (0.017)
Organizational ownership	0.016 (0.844)	0.016 (0.845)
R^2	0.579	0.576
F	41.122 (0.000)	34.025 (0.000)

Note: Intercept coefficient (Model 6) = 0.139, Intercept coefficient (Model 6a) = 0.139.

3.4.5. Summary

Table 11 summarizes the results of the hypothesis tests, showing all are rejected except that H_1, H_{1a}, and H_2.

4. Discussion

Currently, the adoption of MSR in China is mostly led by the Chinese government. The findings show that the more institutional pressure is applied, the better MSRB of the organization (H_1). Moreover, regulatory pressure is the primary source of institutional pressure on MSRB (H_{1a}), while the normative pressure and cultural cognitive pressure have no significant effect on MSRB (H_{1b} and H_{1c}). This finding is mainly due to regulatory pressure playing an important role in megaproject participants' behavior, as echoed in He's et al. (2020) finding that sufficient government regulatory pressure can improve the contractor's environmental behavior. However, normative pressure and cultural cognitive pressure can only be created and formed by a large number of organizational actors, which means that normative pressure and cultural cognitive pressure could hardly be developed when there are still relatively few megaprojects being constructed. For megaprojects, the government is usually like a "wind vane" or "focus", and the behavior of enterprises usually revolves around this focus (McAdams & Nadler, 2010). For MSR, the government plays a leading role (Ma et al., 2017). However, some studies conclude that the driving force of regulatory pressure on social responsibility is ineffective, because social responsibility contains voluntary and altruistic characteristics, and a better way is to promote the development of social responsibility through normative and cultural cognitive pressure (Wang et al., 2018). In other words, enterprises can improve and implement social responsibility by creating a better MSR environmental atmosphere that consciously fulfills or implements MSR. However, as the present study suggests, it will take time to create such an environment.

In addition, the participant's MSRB is affected by its own social responsibility cognition under institutional pressure (H_2), which is consistent with previous research finding that institutional pressure affects the performance of social responsibility by affecting the characteristics of enterprises (Feng & Rong, 2016) with social responsibility cognition. The response and judgment of the organization to institutional pressure largely depends on its social responsibility cognition, and it chooses the most suitable behavior measures based on its position in, and understanding of, the environment (Liu & Wang, 2016). The organizations that attach importance to social responsibility are more sensitive to the requirements of the surrounding institutional pressure for social responsibility in the project, and are more likely to adhere to the requirements of institutional pressure for their own MSRB, thus improving their own social responsibility cognition. The higher the level of an organization's corporate social responsibility cognition, the more sensitive it is to institutional pressure, and the more attention it pays to its own social responsibility behavior in the project.

It is worth noting that, in the present study, information communication mechanism and relationship strength have no significant moderating effect on the relationship between institutional pressure and MSRB (H_3, H_4, and H_5) – a conclusion also supported by Ma et al. (2019), where the positive effect of MSR in megaprojects is weakened by the interactions of primary stakeholders. How-

Table 11. Summary of research hypothesis test results

No.	Hypothesis	Test result
H_1	*Institutional pressure is positively correlated with MSRB*	True
H_{1a}	*Regulatory pressure is positively correlated with MSRB*	True
H_{1b}	*Normative pressure is positively correlated with MSRB*	False
H_{1c}	*Cultural cognitive pressure is positively correlated with MSRB*	False
H_2	*Organizational social responsibility cognition (SRC) mediates the relationship between institutional pressure and MSRB*	True
H_3	*CM positively moderates the relationship between IP and MSRB*	False
H_4	*RS positively moderates the relationship between IP and MSRB*	False
H_5	*RS positively regulates the mediating effect of SRC between IP and MSRB*	False

ever, Wang (2014) believes that a smooth CM can promote the cooperation of megaproject participants to fulfill their social responsibilities for two main reasons. First, in the study of communication relationship, only the relationship between participants is considered, while the social responsibility cognition of participants is not considered: if an organization with a large influence has a low social responsibility cognition, it may have a negative impact on the whole network. Second, although enterprises with a high social responsibility cognition are sensitive to institutional pressure and engineering social responsibility, they are also willing to take the initiative to adopt social responsibility. However, this kind of behavior has not been noticeably publicized and praised in megaprojects, which implies that the organization taking the initiative to adopt MSRB has not obtained substantive benefits. With the increase of the communication intensity between organizations, they will find that adopt MSRB is meaningless. In addition, under the influence of other participants, even if the enterprise itself pays attention to social responsibility, it may no longer be willing to prevent "idle work" in the project.

This study finds that a precondition for the communication between participants to promote social responsibility behavior is for the vast majority of participants to accept that social responsibility is important for megaprojects. It is also found that current institutional pressure mainly promotes the MSRB through regulatory pressure, while normative pressure and cultural cognitive pressure have less impetus (H_{1b} and H_{1c}). This is consistent with Yu and Liu's (2015) finding that regulatory pressure has the greatest impact on the adoption of social responsibility. In this context, the smooth communication between the agents may not only diffuse the effect of institutional pressure better, but also help them avoid some social responsibility behaviors (that they thought unnecessary) through cooperation and other means, which weakens or even offsets the positive impact of institutional pressure on MSRB.

It is therefore important to create an atmosphere of social responsibility through normative pressure and cultural cognitive pressure (Wang et al., 2018): normative pressure changes organizational behavior through shaping certain values, while cultural cognitive pressure mainly affects organizational behavior through imitation. Ethical behavior is most important in social responsibility behavior, and regulatory pressure can only regulate the behavioral bottom line. For responsibility and obligation beyond the bottom line, normative pressure and cultural cognitive pressure play more significant roles. To maximize social responsibility behavior, a more important and fundamental means is to shape the cultural atmosphere. In addition to compulsory measures, the government prioritize leading enterprises to set an example and encourage good social responsibility behavior through rewarding them with some reputation or other benefits so that, when other organizations realize the benefits of adopting social responsibility, they will actively imitate and form a virtuous circle.

Conclusion and future research

Conclusions

A megaproject is a temporary organizational field and, in order to achieve the common construction goal, all participating organizations form a temporary institutional field through material exchange, information exchange, and task cooperation. Under institutional pressure formed by the organizational institutional environment, each participant takes corresponding social responsibility actions. In addition, the relationship of communication and exchanges between participants influences the effect of institutional pressure. In order to clarify the rules of the social responsibility behavior of participants in megaprojects under institutional pressure and improve the overall efficiency of MSR, this study analyzes the rules of MSRB from the perspective of new institutional sociology, which provides theoretical support for the management of MSR. The following conclusions are drawn from the study.

Institutional pressure promotes MSRB, and organizational social responsibility cognition plays a mediating role between institutional pressure and MSRB. Further analysis shows that regulatory pressure is a significant determinant of MSRB, but normative pressure and cultural cognitive pressure have no significant effect on MSRB. Similarly, CM has no significant effect on the relationship between institutional pressure and MSRB, and relationship strength has no significant effect on the relationship between institutional pressure and MSRB and the relationship between social responsibility cognition and MSRB.

At present, institutional pressure on MSR is mainly from regulatory pressure, which means the government mainly uses mandatory measures to require enterprises to adopt social responsibilities. Smooth communication and strong relationships between participants may lessen the effect of institutional pressure. Social responsibility behavior is not a spontaneous behavior, but is driven by fully accepting the concept of social responsibility and fully understanding the necessity and superiority of social responsibility behavior. When this happens, and the information exchange between the project participants is sufficient and the communication is smooth, enterprises cooperate together to adopt any social responsibility behaviors previously seen as unnecessary.

Implications

Based on our research results, in order to improve the social responsibility behavior of megaprojects in practice, cultivation of MSRB can be divided into two stages of first implementing "mandatory measures" and then "creating a cultural atmosphere of social responsibility". In the first stage, when regulatory pressure is dominant, the information CM may inhibit the spread of social responsibility behavior; therefore, managers need to focus on strengthening the supervision and guidance of key organizations. When the second stage is reached and the cultural atmosphere of social responsibility of the project is established,

the information CM becomes the catalyst for the diffusion of social responsibility behavior.

(1) Mandatory measures first. Firstly, the government adopts compulsory means to attract the attention of all participants to social responsibility and raise its awareness in each participant. Given that the concept of MSR is vague and its consciousness is relatively weak in China, some compulsory means are indispensable, such as laws and regulations, relevant regulations, and contractual constraints: the government sends a strong signal to society that this issue is very important through the formulation of laws and regulations related to social responsibility. Then all social sectors begin to attach importance to this issue, forcing companies to focus on it, so as to improve the awareness of the agents' social responsibility.

(2) Creating a cultural atmosphere of social responsibility. Mandatory measures can only regulate the behavioral bottom line, but the requirements of social responsibility are obviously higher than that. Normative pressure and cultural cognitive pressure play more significant roles in determining behavior beyond the bottom line. Social responsibility behavior has ethical properties and requires the voluntary initiative of participants. Therefore, the use of compulsory measures to promote social responsibility behavior is only a temporary means, while the real long-term mechanism is the construction of a cultural atmosphere: for example, providing a guide the public for engineering social responsibility, attracting media reports on the process of engineering social responsibility, and regularly rewarding projects and organizations that focus on socially responsibility behaviors. The main and fundamental means of encouraging social responsibility behavior is by shaping the cultural atmosphere, i.e., creating a cultural atmosphere of social responsibility throughout megaprojects, and using flexible means to "force" organizations to regard their own social responsibility behavior.

Limitations and future research

This study is limited by the respondents being solely from the megaproject construction sites in Shenzhen, thus inevitably restricting the generalizability of the findings. In addition, social responsibility behavior is mainly examined at the construction stage, while the behavior rules in different project stages are likely to be different. In order to further improve the reliability and practicability of the research results, future research needs to be conducted with respondents at the national or even global level, and the social responsibility behavior rules involved in different construction stages analyzed and compared. In addition, in the face of this internationalized world, what elements might influence the MSR of international contractors is also a question worth addressing.

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Author contributions

All authors have contributed equally.

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APPENDIX

Megaproject Social Responsibility Behaviors Questionnaire

Dear Madam / Sir:

Thank you very much for your support and participation! The questionnaire only takes you about 15 minutes.

We are a research team from South China University of Technology. The survey data is only used for academic research. We will keep your private information strictly confidential. There is no right or wrong answer to all the questions involved in the questionnaire. Please answer them according to your real feeling from the current megaproject your company involved. Because incomplete filling of the questionnaire will make your response invalid, so please do not miss any item!

The "social responsibility" mentioned in the questionnaire means that the company is responsible for the impact of its actions on the "environment, employees, community, and other project participants" during the megaproject construction process.

Part I Megaproject Social Responsibility Behavior and Social Responsibility Cognition

1. What are the types of your organization? (If your organization is both government and owner, please select the project owner for this item)

○ Government	○ Project owner	○ Construction company
○ Supervision company	○ Consulting company	○ Other

2. Based on the actual situation, please judge the degree of conformity between the following expressions and the **Project owner**, and give a score.

	Totally inconsistent	Less inconsistent	Generally fit	More consistent	Totally consistent
1. Have a perfect engineering project management system	○	○	○	○	○
2. Have a perfect engineering quality and safety management mechanism	○	○	○	○	○
3. Pay attention to the safety and reasonable return of investment funds	○	○	○	○	○

	Totally inconsistent	Less inconsistent	Generally fit	More consistent	Totally consistent
4. Pay attention to green building and environmental protection in the process of project construction	○	○	○	○	○
5. Actively listen to and adopt the green construction and environmental protection opinions of relevant units in the process of project construction	○	○	○	○	○
6. Pay attention to the needs of the surrounding community in the construction process	○	○	○	○	○
7. Participated in surrounding community activities or invited the surrounding community public to participate in activities during the construction process	○	○	○	○	○
8. Consideration of social stability in the process of construction and decision-making	○	○	○	○	○

3. Based on the actual situation, please judge the degree of conformity between the following expressions and the **Construction company,** and give a score.

	Totally inconsistent	Less inconsistent	Generally fit	More consistent	Totally consistent
1. Have perfect project quality and safety management mechanism	○	○	○	○	○
2. Reasonable cost and construction period control in the process of project construction	○	○	○	○	○
3. New technology, process or other construction innovations are used in the construction process	○	○	○	○	○
4. Pay attention to the rational use of resources and reduce the waste of resources	○	○	○	○	○
5. Pay attention to protect local community environment and reduce environmental and noise pollution during construction	○	○	○	○	○
6. Pay attention to the protection of local ecological environment during construction	○	○	○	○	○
7. Have emergency measures for public emergencies (involving local residents)	○	○	○	○	○
8. Pay attention to the needs of the surrounding community in the construction process	○	○	○	○	○
9. Participated in surrounding community activities or invited the surrounding community public to participate in activities during the construction process	○	○	○	○	○

4. Based on the actual situation, please judge the degree of conformity between the following expressions and the **Supervision company**, and give a score.

	Totally inconsistent	Less inconsistent	Generally fit	More consistent	Totally consistent
1. Conduct construction supervision fairly and fairly as an independent third party	○	○	○	○	○
2. Fair supervision to ensure the quality and safety of the project	○	○	○	○	○
3. Fair supervision to ensure reasonable project cost	○	○	○	○	○
4. Fair supervision to ensure the progress of the project	○	○	○	○	○
5. Fair supervision to ensure the rights and interests of construction workers	○	○	○	○	○
6. Fair supervision to ensure that construction activities meet the requirements of environmental protection	○	○	○	○	○
7. Fair supervision to ensure the reasonable utilization of resources in the construction process	○	○	○	○	○

5. Please give a score according to the actual situation of your company.

	Totally inconsistent	Less inconsistent	Generally fit	More consistent	Totally consistent
1. My company has a clear social responsibility implementation plan	○	○	○	○	○
2. My company has a complete social responsibility management system	○	○	○	○	○
3. My company pay attention to the rational use of resources and reduce the waste of resources	○	○	○	○	○
4. My company pay attention to protect the local community environment and reduce environmental and noise pollution	○	○	○	○	○
5. My company pay attention to the protection of local ecological environment	○	○	○	○	○
6. My company pay attention to the health and safety of employees	○	○	○	○	○
7. My company regularly arrange various education and training (including safety education, professional skills training, etc.)	○	○	○	○	○
8. My company pay attention to the humanistic care of employees	○	○	○	○	○
9. My company participate in charity activities regularly	○	○	○	○	○

Part II Institutional Pressure and Communication Mechanism

6. Relevant government departments require the project to pay attention to social responsibility.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

7. Relevant government departments guarantee social responsibility through strict supervision and law enforcement.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

8. Relevant government departments publicize the concept of social responsibility in various forms.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

9. Relevant government departments have severe punishment measures for the business behaviors violating the social responsibility.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

10. The megaproject vigorously publicizes social responsibility and requires enterprises to pay attention to social responsibility.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

11. The industry association requires the project to pay attention to social responsibility.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

12. The local public highly appreciates the corporate social responsibility.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

13. The media reports and pays attention to the social responsibility performance of megaproject.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

14. The social responsibility education received by the company's leaders and employees has a strong influence on the enterprise.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

15. Enterprises in the industry improve their popularity due to better performance of their social responsibilities.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

16. Peers who have done a good job in social responsibility construction have a good performance in business.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

17. Enterprises in guiwan construction area are praised for their good performance of social responsibility.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

18. The performance of social responsibility of local or peer benchmarking enterprises has a profound impact on the enterprise.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

19. In the megaproject, enterprises can adopt effective communication methods, such as charts, tables, lists, etc.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

20. The information sharing among enterprises in the megaproject is very accurate, through joint office and regular meeting.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

21. Communication with other teams in the megaproject through documents is very timely.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

22. The information platform provides enough knowledge acquisition channels for everyone.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

23. Our company can get enough information to make a decision at the right time.

○ Totally inconsistent ○ Less inconsistent ○ Generally fit ○ More consistent ○ Totally consistent

Part III Relationship Strength

24. Please rate the frequency of your company's contact with other organizations according to the actual situation during the construction of Shenzhen-Qianhai district construction project.

	Almost no contact	Less contact	Commonly contacts	More contacts	Frequent contacts
Shenzhen Hong Kong Modern Service Industry Cooperation Zone Administratio	○	○	○	○	○
Qianhai Shekou free trade new town construction headquarters (New Town Office)	○	○	○	○	○
Consulting company (project management company)	○	○	○	○	○
Construction company of other project	○	○	○	○	○
Contractor in charge of the project	○	○	○	○	○
Contractors for other projects	○	○	○	○	○
Supervision company in charge of the project	○	○	○	○	○
Supervision company of other projects	○	○	○	○	○
Design company	○	○	○	○	○
Supplier	○	○	○	○	○
Investment financial institutions	○	○	○	○	○
Public	○	○	○	○	○
Media	○	○	○	○	○
Other NGOs	○	○	○	○	○

25. Please assess the impact of the following organizations on your work and decision-making during the construction of Shenzhen-Qianhai district construction project, and rate according to the impact.

	Almost no impact	Less impact	Commonly impact	More impact	Great impact
Shenzhen Hong Kong Modern Service Industry Cooperation Zone Administratio	○	○	○	○	○
Qianhai Shekou free trade new town construction headquarters (New Town Office)	○	○	○	○	○
Consulting company (project management company)	○	○	○	○	○
Construction company of other project	○	○	○	○	○
Contractor in charge of the project	○	○	○	○	○
Contractors for other projects	○	○	○	○	○
Supervision company in charge of the project	○	○	○	○	○
Supervision company of other projects	○	○	○	○	○
Design company	○	○	○	○	○
Supplier	○	○	○	○	○
Investment financial institutions	○	○	○	○	○
Public	○	○	○	○	○
Media	○	○	○	○	○
Other NGOs	○	○	○	○	○

Part IV Essential Information

26. Which megaproject does your company participate in? Would you please write down the names of the participating projects below?

_____

27. What's your gender?

○ Male ○ Female

28. What is your education background?

○ Senior high school and below ○ Junior college

○ Undergraduate ○ Master and above

29. What's your position?

○ Grassroots managers ○ Middle managers

○ Top management ○ Other

30. What's your working time?

○ Under 5 years ○ 6–10 years ○ 11–15 year

○ 16–20 years ○ More than 20 years

31. What is the nature of your company?

○ Government department ○ State-owned enterprise ○ Private company

○ Foreign company ○ Other