



# Social responsibility of major infrastructure projects in China

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## Abstract

China has implemented a large number of major infrastructure projects (MIPs) over the last three decades. Social responsibility management is crucial for MIPs' sustainable development. What is social responsibility of major infrastructure (MIP-SR)? To answer this question, this article proposes the concept and key issues of major infrastructure projects' social responsibility (MIP-SR) and develops a comprehensive conceptual framework for MIP-SR, which covers three dimensions: (i) project life-cycle dynamics; (ii) stakeholder's heterogeneity and (iii) social responsibility interactivity. The three-dimensional framework provides a systematic framework for MIP-SR's academic research and practical implementation, which in turn promotes the sustainable development of MIPs.

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## 1. Introduction

Major infrastructure projects (MIPs) are large-scale engineering facilities which provide fundamental public services for social production, economic development, and people's life, such as large-scale hydropower projects, high speed railways, expressway networks, gas pipeline projects and long-span bridges (Flyvbjerg, 2011). As the MIPs possess very important strategic positions in the national economy and social development, their social responsibility and sustainability have attracted widespread attention (Demetriades and Mamuneas, 2000; Flyvbjerg, 2014).

Large-volume MIPs have been designed, built and operated in China. Since the reform and open policy in 1978, a range of great projects such as the Three Gorges Dam, Qinghai–Tibet Railway and West–East National Gas Transmission Projects, have been built and operated. China has accumulated extensive experiences and gained impressive achievements on MIP

construction and management (Shen et al., 2011a). However, it cannot be ignored that a series of public incidents about MIPs have aroused people's wide concerns in recent years (e.g. information disclosure problems in a serious accident<sup>1</sup>; violent clashes between the China Railway Group and local communities). The unexpected group incidents caused by environmental destruction or immigration settlement during construction are still common. These social responsibility deficiencies in MIPs have gone beyond the engineering projects themselves and widely triggered severe social concerns. Social responsibility has become one of the critical strategic factors related to the sustainable development of MIPs.

In the global context of sustainable development, China's MIPs are currently standing at a special and crucial period with strategic opportunities, environmental sensitivity and value reconstruction (Shen et al., 2011b). First, China's economy is already huge and is growing at the fastest rate compared to that

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<sup>1</sup> A bullet train accident happened in the rail line from Ningbo to Wenzhou in July 23, 2011, in which about 40 people were killed.

of any developed nation in the last several decades, which gives great strategic opportunities for MIP implementation. Both national and local governments have proposed to focus on MIPs to stimulate domestic demand and maintain steady economic growth (Chen et al, 2013). Second, China's environmental problems are among the most severe of any major countries around the world and are mostly getting worse (Liu and Diamond, 2005). However, China is only ranked 118 out of 178 countries in the 2014 Environmental Performance Index (EPI).<sup>2</sup> Infrastructures are great projects which transform the nature of human activities and bring dramatic and permanent impacts to the environment. Since the public awareness of environmental protection, MIPs' great challenges on environmental protection and ecological balance have attracted wide concerns. Third, sustainable development becomes an important topic for governments, researchers and enterprises (McMichael, 2011; Sachs and Reid, 2006). Under the enormous pressures of natural resources and environment, MIPs' implementation development has presented a trend of valuable reconstruction from traditional GDP to sustainability. Above all, MIP development faces special and complex challenges in China nowadays and in such context, the pressing questions of its social responsibility need to be answered urgently.

This article analyzes the connotations of major infrastructure projects' social responsibility (MIP-SR). The main contribution of this article is to develop a systematic framework for MIP-SR, which covers three dimensions: (i) project life-cycle dynamics; (ii) stakeholder's heterogeneity and (iii) social responsibility interactivity. It is also hoped that the study can shed some light on the sustainable development of MIPs in emerging economies.

The remainder of this article is organized as follows. In the second section, the literature of infrastructure projects and social responsibility is reviewed. Next, the definition and key issues of MIP-SR are described. Dimensions and framework of MIP-SR are proposed in the fourth section. The final section presents commentary and conclusion, as well as limitations and some implications for future studies.

## 2. Literature review

### 2.1. Infrastructure management

Since a group of research centers on infrastructure management were established around the world,<sup>3</sup> infrastructure project management has received recent popular and academic attention. Many themes are involved, such as decision making, risk management, multi-project synergy and life-cycle cost (Flyvbjerg et al., 2009; Miller and Lessard, 2000; Priemus et al., 2008). It is noteworthy that complexity and sustainability are proposed as important issues on infrastructure management (Bosch-Rekvelde et al., 2011; Davies and Hobday, 2005; Flyvbjerg, 2014; Levitt, 2007).

#### 2.1.1. Complexity of infrastructure

Major infrastructures can potentially bring huge financial investments, a long implementing period and multitudinous stakeholders. Infrastructures are thus complex engineering systems, which possess complicated uncertainties, potentially high risks and profound and lasting impacts on the economy, environment and society (Flyvbjerg et al., 2003; Miller and Hobbs, 2005). Complex engineering management needs to be understood and treated from the complex system perspective, in which it is important to capture the complex issues beyond the engineering itself (Ottino, 2004).

Baccarini (1996) proposes the concept of project complexity with differentiation and interdependency, which is developed by other scholars, such as Williams (2002), Remington and Pollack (2007) and Vidal and Marle (2008). Baccarini (1996) classifies project complexity into organizational complexity and technical complexity. Maylor (2003) then adds resource complexity as the third pattern; furthermore, other studies improve and enrich the patterns of complexity (Gerald, 2008; Puddicombe, 2012; Xia and Lee, 2004). Otherwise, complexity analysis of major infrastructure is also developed (Alberts et al., 2004; Solis et al., 2013; Winter et al., 2006). Other topics of complexity of engineering are also explored, such as the organization interactivity (Antoniadis et al., 2011), large and complex networks (Pauget and Wald, 2013), and project communication and complexity (Senescu et al., 2012). In general, infrastructure complexity consists of technical complexity, organizational complexity and environmental complexity (Bosch-Rekvelde et al., 2011).

Peculiarly, the organizational and environmental components reflect the necessity and urgency of sustainability management on major infrastructure, which is associated with the complex dimensions of social responsibility. On one side, organizations in infrastructure have complex constitution, relationship and behaviors, which call for a higher strategic perspective (Thiry and Deguire, 2007). On the other side, the mainly complex environment involved in infrastructure management is about the social background and networking.

#### 2.1.2. Sustainability of infrastructure

The complexity of major infrastructure brings the challenges of sustainability and social responsibility. Especially in the context of business globalization, technology integration and the whole life-cycle process, modern infrastructure project management must consider the economic, social and environmental impacts during the full life-cycle coverage (Levitt, 2007; Saynisch, 2008).

Numerous previous studies focused on the economic sustainability of infrastructure, including both projects' intrinsic objectives and their economic impacts on social economy (Atkinson, 1999; Demetriades and Mamuneas, 2000; Morrison and Schwartz, 1996; Munnell, 1992). As the success criteria of general projects, major infrastructures have to adopt the multi-objective strategy including cost, time and quality (Atkinson, 1999). However, major infrastructures have undertaken various functions which affect the nation and its society, thus it is more difficult to coordinate and deal with the conflicts from various objectives rather than conflicts from general projects (Flyvbjerg,

<sup>2</sup> See <http://epi.yale.edu/epi/country-rankings/>.

<sup>3</sup> For example, Centre for Infrastructure & Construction Industry Development at Hong Kong in 2002, Centre for Major Program Management at Oxford in 2007, International Centre for Complex Project Management in 2008, Centre for Infrastructure Development at Manchester in 2010, etc.

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