



How the public reacts to social impacts in construction projects? A structural equation modeling study

Yang Wang^a, Qi Han^b, Bauke de Vries^b, Jian Zuo^{c,*}

^a School of Civil Engineering, Wuhan University, 299# Bayi Road, Wuchang District, Wuhan 430072, China

^b Department of Built Environment, Eindhoven University of Technology, P.O. Box 513, Eindhoven 5600, MB, The Netherlands

^c School of Architecture & Built Environment; Entrepreneurship, Commercialisation and Innovation Centre (ECIC), The University of Adelaide, SA 5005, Australia

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Abstract

By combining the psychosocial and social impact assessment model, this study explores the complex interrelationship between public reaction and social impacts in construction projects via the structural equation modeling. A road construction project in Wuhan, China was selected as case study and a face-to-face interview survey was conducted. Results showed that public reaction occurs through a chain of events rather than one-time independent event. This study revealed that inefficient communication is the most critical risk where public awareness plays a mediation role. The low level of awareness leads to limited knowledge, which in turn results in irrational behavior. Furthermore, a closer residence, high-level dependency and greater change in living tend to attract more concerns on project impacts. This calls for the change of paradigm of social impact assessment in construction projects from the engineering-oriented to the people-oriented approach. This provides useful inputs to facilitate the public participation and alternative analysis.

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1. Introduction

Management of risks forms an integral part of project management to achieve project objectives (Hwang et al., 2014; Luzon and El-Sayegh, 2016), and construction projects are no exception. Indeed, construction is a risky business, arguably due to significant impacts of related activities on the society, environment and economy (Akintoye and MacLeod, 1997; Mpakati-Gama et al., 2016; Taroun, 2014). Among these three commonly accepted pillars, the social dimension is considered as the least explicit aspect of sustainable development (Jaafar

et al., 2016; Vifell and Soneryd, 2012). Social related issues need to be taken into consideration for end users, and surrounding community (Valdes-Vasquez and Klotz, 2013; Zhao et al., 2016). Common social impacts associated with construction projects include: land acquisition and disposal, relocation of local residents, health risks due to the release of waste (Mathur, 2011; Patil and Laishram, 2016). Most significant issues associated with social impact management in construction projects include: the social structure of technical risk, lack of public participation, and the imbalance of cost and benefit distribution among stakeholders (Gupta et al., 2012; Shi et al., 2015).

It is a common practice to undertake impact assessment during the appraisal and decision phase. In 1969, the National Environmental Policy Act was established in United States, and the most significant outcome was the requirement that all executive federal agencies prepare the environmental assessment

* Corresponding author.

E-mail addresses: wangyang.whu@foxmail.com (Y. Wang), q.han@tue.nl (Q. Han), b.d.vries@tue.nl (B. de Vries), jian.zuo@adelaide.edu.au, sageorgezuo@yahoo.com.au (J. Zuo).

(Vanclay, 2006). It is considered as the origin of environmental impact assessment (EIA), social impact assessment (SIA) and social risk assessment (SRA). Since then, developing countries were prompt in embracing EIA in the planning process (Momtaz and Kabir, 2013).

Social risk is a concept that is similar to social impact. However, social impacts refer to more certain social consequences of an activity than social risks (Liu et al., 2016; Mahmoudi et al., 2013). Indeed, a number of organizations (e.g. the World Bank, Asian Development Bank, and United Nations Development Programme) have demanded compulsory SIA/SRA as part of tendering process (Mathur, 2011; Vanclay, 2012; Zuo et al., 2012a; Zuo et al., 2012b). In China, the trial regulation of “Guidance on establishing Social Stability Risk Assessment (SSRA)” was released in 2012, which specified mandatory SSRA in mega projects (Liu et al., 2016).

One vital perspective of social evaluation in construction project involves estimating associated impacts on the community during early stage of the project which provides useful inputs for decision making process (Valdes-Vasquez and Klotz, 2013). In China, social risks associated with construction projects also attracted a growing level of attention (Liu et al., 2016). In the past three decades, the urbanization level and economic growth increased with average rate 1.05% and 9.8% respectively per annum in China, as reflected in the large number of mega projects. There is a growing public concern on the environmental, social, human health issues and human rights derived from these construction projects. The ineffective social risk management has led to severe social responses and group contradictions, even emotive violent conflicts. As a result, some projects ultimately ended in postponement, relocation or cancelation. Intensive public reaction due to the social impacts in construction projects turned into the trigger of regional social instability in China (Li et al., 2012b; Liu et al., 2016; Shi et al., 2015).

However, current practice of the social evaluation has generally been limited to “the process of assessing or estimating the social consequences that are likely to follow from specific policy actions or project development” (Vanclay and Maria da, 2011). When the social risks are characterized by limited or uncertain data about their effect on human beings, despite the provision of related information, it remains unclear how the public responds to government guidance in the presence of uncertainties and risks (Markon and Lemyre, 2013). It is well recognized that stakeholders’ perceptions on risk vary according to their level of knowledge, expertise, roles, interests, attitudes and awareness (Van Os et al., 2015). Very few studies have attempted to explore how the public reacts to potential social impacts of construction projects. This study aims to explore: (1) How does public react to social impacts in construction project formed during the project appraisal process? (2) What are key factors and how do they affect public reaction?

2. Literature review

Social impact is defined as “...the consequences to human populations of any public or private actions-that alter the ways in which people live, work, play, relate to one another, organize

to meet their needs, and generally cope as members of society” (ICGP, 2003). In order to mitigate social impacts, SIA has been widely used in the project appraisal.

From the perspective of risk management, it is crucial to identify and alleviate the negative social consequences derived from construction projects. People’s way of life, their culture and their community were first classified by Armour (1990), and expanded with their health, well-being, personal and property rights, aspirations and fears by Vanclay and Petts (1999). “Standard” social impacts, i.e. noise level, pollution were identified as general impact categories (Juslén, 1995), and attitudes and changes of lifestyle were identified in more general typologies. Burdge et al. (1995a) suggested the changes in human population, communities, and social relationships due to construction project as dimensions of social impact. Similarly, Vanclay (2002) highlighted health, safety and human rights should not be overlooked, so as the broader social objectives and goals of development.

Last two decades have witnessed that the social evaluation has gained rapid development in both theory and practice. In 1994, Interorganizational Committee on Guidelines and Principles (ICGP) for Social Impact Assessment (SIA) presented the fundamental principles and operational guidelines, which is considered as “the first systematic and interdisciplinary statement to offer guidelines and principles to assist government agencies and private sector” (Burdge et al., 1995a). By comparing the list of social impact variables proposed by the ICGP and Burdge et al. (1995b); Vanclay (2002) conceptualized a framework for social impacts by highlighting the consequences of policies and programs. Arce-Gomez et al. (2015) redeveloped the SIA procedural framework by adopting two steps towards ex-post use of SIA processes.

It is worth noting that social impacts are reflected at various scales, ranging from the micro-scales of individual to the macro-scales of community (Schirmer, 2011). The former usually quantifies the social impact an individual has on his/her community when he/she performs on project and transmits the information to his/her neighbors, and it often combined direct and indirect expected behavior for each individual within the network (Ekpenyong et al., 2014). On contrary, the latter focuses on identifying the macro-scale social changes that results from an event and assessing macro-scale social impacts (Schirmer, 2011). Furthermore, recent studies have suggested that evaluation at multiple-scale social aspect will play a pivotal role by considering cumulative social impacts (Mahmoudi et al., 2013), forced migration (Tilt et al., 2009), ethical issues (Baines, 2011), human rights (MacNaughton, 2011), climate change (Allan et al., 2011) and sustainability (Ahmadvand and Karami, 2009).

During the project appraisal process, the traditional SIA models are used to analyze, monitor and manage both positive and negative social consequences. The vital process is to identify potential undesirable social effects, enhance positive impacts and mitigate any negative impacts. Asia Development Bank provides a handbook for social dimensions of projects which summaries the most critical factors for social assessment, i.e. beneficiaries, needs and demands, attitude and adverse

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