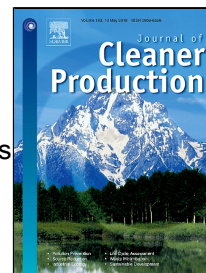


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A Review of Multi-Criteria Assessment of the Social Sustainability of Infrastructures

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## A REVIEW OF MULTI-CRITERIA ASSESSMENT OF THE SOCIAL SUSTAINABILITY OF INFRASTRUCTURES

### ABSTRACT

Nowadays multi-criteria methods enable non-monetary aspects to be incorporated into the assessment of infrastructure sustainability. Yet evaluation of the social aspects is still neglected and the multi-criteria assessment of these social aspects is still an emerging topic. Therefore, the aim of this article is to review the current state of multi-criteria infrastructure assessment studies that include social aspects. The review includes an analysis of the social criteria, participation and assessment methods. The results identify mobility and access, safety and local development among the most frequent criteria. The Analytic Hierarchy Process and Simple Additive Weighting methods are the most frequently used. Treatments of equity, uncertainty, learning and consideration of the context, however, are not properly analyzed yet. Anyway, the methods for implementing the evaluation must guarantee the social effect on the result, improvement of the representation of the social context and techniques to facilitate the evaluation in the absence of information.

**KEYWORDS:** infrastructure; multi-criteria; social sustainability; equity; stakeholders; uncertainty.

### 1. INTRODUCTION.

The social dimension is one of the pillars of sustainability. However, evaluation of the social aspects is taken less into consideration than the economic and environmental dimensions (Missimer et al. 2017, Díaz-Sarachaga et al. 2016). Indeed, some public projects have not yet integrated the social aspects sufficiently and instead focus their attention on socioeconomic performance (Valdés-Vázquez and Klotz 2013, Torres-Machi et al. 2017). Polese and Stren (2000) define social sustainability as “*development that is compatible with harmonious evolution of civil society, fostering an environment conducive to the compatible cohabitation of culturally and socially diverse groups while at the same time encouraging social integration, with improvements in the quality of life for all segments of the population (p. 229).*”

Specifically, publicly funded civil engineering projects seek out social development that will justify their investment. Civil engineering projects seek to build services and facilities, which are basically needed for transportation and energy supply; they are generally called infrastructures. The development of infrastructures involves the design, construction, operation and dismantlement of the service or facility in order to comply with a public need (Pellicer et al. 2014). In this sense, infrastructures represent an intermediary link that opens opportunities for sustainable social development (van de Walle 2002, Mostafa and El Gohary 2014). By contrast, not considering the social dimension in an infrastructure’s development may have detrimental effects on the project and society (Temper et al. 2015, Naderpajouh et al. 2014). In the short term, the dynamics of increasing participation by stakeholders and their interactions imply risks that challenge the fulfillment of the project when a suitable social treatment is not preconceived (Munda 2004, Naderpajouh et al 2014). In addition, the non-

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