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Will the application of spatial multi criteria evaluation technique enhance the quality of decision-making to resolve boundary conflicts in the Philippines?

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ABSTRACT

Systematic studies that evaluate the quality of decision-making processes are relatively rare. Using the literature on decision quality, this research develops a framework to assess the quality of decision-making processes for resolving boundary conflicts in the Philippines. The evaluation framework breaks down the decision-making process into three components (the decision procedure, the decision method, and the decision unit) and is applied to two ex-post (one resolved and one unresolved) and one ex-ante cases. The evaluation results from the resolved and the unresolved cases show that the choice of decision method plays a minor role in resolving boundary conflicts whereas the choice of decision procedure is more influential. In the end, a decision unit can choose a simple method to resolve the conflict. The ex-ante case presents a follow-up intended to resolve the unresolved case for a changing decision-making process in which the associated decision unit plans to apply the spatial multi criteria evaluation (SMCE) tool as a decision method. The evaluation results from the ex-ante case confirm that the SMCE has the potential to enhance the decision quality because: a) it provides high quality as a decision method in this changing process, and b) the weaknesses associated with the decision unit and the decision procedure of the unresolved case were found to be eliminated in this process.

Introduction

Land use and environmental conflicts often require both accurate and high-quality decision-making to resolve complex issues among the stakeholders. Indeed, the need for more systematic studies to evaluate the quality of the decision-making in resolving environmental conflicts has been highlighted in the literature (Rauschmayer and Wittmer, 2006). Within this context, decision-making is a social process that selects from a set of options the alternative(s) that is/are most likely to lead to the desired outcomes and includes those who make the decision as well as those affected by the decision (Balasubramanian et al., 1999; Wittmer et al., 2006). Mintzberg et al. (1976) argue that the decision-making process is composed of three main components: the decision procedure, the decision unit, and the decision method. The decision procedure is referred to as the steps/activities that are required in a decision-making process to finally reach a valid and accepted decision. The common steps of a decision procedure may include agenda building, decision preparation, evaluation, decision realisation, feedback, and revision of the decision (Peters and Hulscher, 2006). On the other hand, individuals/groups who actively participate in different steps of a decision procedure are defined as the decision unit (Hermann, 2001; Peters and Hulscher, 2006). When a decision-making process becomes mired in conflicts arising from multi-party involvement due to the need to resolve a complex decision problem[1], a decision unit often seeks decision support tools/techniques to make a decision (Ackoff, 1981; Bouyssou et al., 2000). These tools/techniques are often referred to as decision methods (Brown, 2005). Bouyssou et al. (2000) have classified decision methods into the categories of formal methods (e.g., voting, cost-benefit analysis, multi-criteria analysis, decision tree) and informal methods (e.g., tossing a coin, asking an oracle, visiting an astrologer).

The aim of this paper is to evaluate the quality of the decision-making processes aimed at resolving boundary conflicts in the Philippines through the development of a decision-quality evaluation framework. Traditionally, two approaches have been used to evaluate the quality of decision-making: a) an evaluation of

[1] Ackoff (1981) has defined a decision problem as a situation in which an individual or a group perceives a difference between a present state and a desired state and where: a) the individual or group has alternative courses of action available, b) the choice of an action can have a significant effect on this perceived difference, and c) the individual or group is uncertain a priori as to which alternative should be selected.

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the processes used to make a decision (referred to as the process-oriented approach), and b) an evaluation of the different outcomes of a decision (referred to as the outcome-oriented approach) (Davern et al., 2008; Hershey and Baron, 1992; Keren and Bruin, 2003; Zakay, 1984). The process-oriented approach evaluates the efforts used to make a decision (Timmermans and Vlek, 1996). The primary argument put forward is that decisions are made under uncertainty, and as a result, the processes are critical in defining the quality of the decision (Edwards et al., 1984). In contrast, the outcome-oriented approaches argue that people are less likely to follow the guidelines provided by the process-based literature, and instead, when judging decision quality, they tend to focus on the substantive outcomes rather than the processes (Hershey and Baron, 1992; Jones et al., 1997). Lipshitz and Barak (1995) argue that a decision process and its outcomes are probabilistically related, and therefore, the appropriate criteria for the evaluation of a decision is not what actually happened but what might have happened. In addition, to operationalise the outcome-oriented approaches, one must know the outcomes of a decision, which are not realistically accessible to an analyst prior to the decision. As a result, this paper follows a process-oriented approach to evaluate the quality of decision-making.

Systematic studies evaluating the quality of decision-making processes are relatively rare (Davern et al., 2008; Keren and Bruin, 2003). The previous research aimed at evaluating the quality of decision-making processes is generally fragmented and can be broadly constructed into two groups. The first group examines the impact of different types of computer-aided tools on the quality of the decision-making process and includes such approaches as Group Decision Support Systems, Intelligent Decision Support Systems, and E-negotiation (see, Coll et al., 1991; Larsen, 2003; Limayem et al., 2006; Moreau, 2006; Pedro et al., 2004; Timmermans and Vlek, 1996). These tools are commonly referred to as planning/decision support systems and are therefore synonymous with the decision method concept in this paper (Geertman and Stillwell, 2010). The second group examines the impact of a specific component (other than a decision method) of a decision-making process (e.g., size of participation, data quality, visualisation quality, quality of the decision-makers, decision-making duration) and its effect on the decision-making quality (Borchers, 2005; Carmeli and Schaubroeck, 2006; Fiedler and Kareev, 2006; see for instance, Ganster et al., 1991; Lipshitz and Barak, 1995; Malhotra et al., 2007; Raghunathan, 1999; Schulte and Peter Grüner, 2007). All of these components, including the decision support tools, represent only a portion of the decision-making process, and therefore, a more comprehensive analysis is required to evaluate the quality of a decision process.

Early research by Hart (1985) provides a comprehensive framework for evaluation of the quality of group/collaborative decision-making processes. This work derived three sets of interrelated components of group decision-making based on the literature: a) process – which is defined as procedural rationality (fair, open and collaborative), b) content – understanding of the preferences and viewpoints of the participants involved in the process, and c) outcome – use of the results by the participants, i.e., acceptance of the process outcomes by the decision units involved. The study did not evaluate the quality of the unit itself and did not include any relevant criteria/components to assess the relevance/suitability of any tools/methods used.

In contrast, Wittmer et al. (2006) developed a framework with criteria (e.g., information management, legitimacy, social dynamics, and cost) to assess the appropriateness of the decision methods used to resolve conflict. However, no empirical studies were used to operationalise the framework. Using a similar framework, Rauschmayer and Wittmer (2006) evaluated several decision support methods and concluded that multi-criteria evaluation (MCE) methods can be applied to conflict resolution because the analytical methods are particularly suitable for stakeholder engagement. However, many studies have highlighted the observation that the application of a potentially useful decision method/tool does not necessarily mean a "sure win" solution (Davern et al., 2008; Hart, 1985). Bouyssou et al. (2000) have argued that a "best method" cannot exist that is empirically correct in all contexts; a decision aid must take into account the capabilities and needs of the people who will implement and use the aid (Brown, 2005). Therefore, an evaluation of the quality of a decision method should focus on determining whether the method fits the purpose in a specific decision-making context (Rauschmayer and Wittmer, 2006; Wittmer et al., 2006).

Based on the above discussion, the objective of this research is twofold: first, to develop a framework to evaluate the quality of decision-making processes in resolving environmental conflicts such that the strengths and weaknesses associated with the processes can systematically be identified; and second, to examine whether the introduction of a specific decision support tool known as the 'spatial multi criteria evaluation (SMCE)' will enhance the quality of decision-making processes in resolving conflicts. The research uses municipal boundary conflicts in the Philippines as case studies to operationalise the developed framework. The remainder of this paper is organised into four sections: 'Municipal boundary conflict' Section reviews the literature on the identification of the nature and causes of municipal boundary conflicts; it also gathers evidence of the methods applied in resolving boundary conflicts. 'Methods' Section outlines the methods, evaluation framework and case studies used to analyse the quality of the decision-making processes. 'Results' Section provides the evaluation results of the decision processes used in the different case studies. 'Discussion and conclusion' Section concludes the paper by drawing on specific empirical results from the application of the SMCE in the case studies.

Municipal boundary conflict

Boundary conflict, which often results from the creation of a fuzzy boundary, is a specific type of environmental conflict characterised by its nature: a boundary is shared between different actors, and if a boundary conflict exists, the contenders often lack access to resources within the conflicting areas (Gleditsch et al., 2006; Shmueli, 2008). Shmueli (2008) has identified different attributes of the contenders, which include attitudes, perceptions, interests and needs, that shape the level of the disputes and are strongly influenced by the geographical milieu in terms of both the human and physical landscapes. Research has shown that municipal boundary conflict is a multifaceted type of conflict with different levels: a) geopolitical (e.g., electoral interests – manipulation of an electoral boundary to influence the political power of parties), b) economic (e.g., municipalities aim to maximise the amount of land uses that contribute the most to their local tax base and to minimise the size of the burden on municipal services), c) local identities (e.g., powerful sentiments for the preservation of historical local identities), and d) cultural/inter-group relationships (e.g., ethnic disputes) (O'Loughlin, 1991; Razin and Hazan, 2004; Shmueli, 2008). Generally, the first two issues are common in a pluralist society whereas the later two are common in a deeply divided society (Razin and Hazan, 2004). This research identifies that the existence of fuzzy boundaries (the lack of a precise technical boundary) triggers municipalities in the Philippines to grab additional land from neighbouring municipalities primarily to increase their revenue. Within this context, the establishment of precise technical boundaries faces difficulty for three reasons:

a. the municipalities were created by the Presidential Executive Order, which provided only a narrative description of the