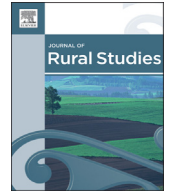




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# Identifying priority areas for rural housing development using the participatory multi-criteria and contingent valuation methods in Alange reservoir area, Central Extremadura (Spain)



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## ABSTRACT

Reservoir areas in the Spanish urban fringe are under increasing pressure from construction sprawls, including illegal construction, human movement, and growing recreational and tourist awareness. Consequently, the conflict between rapid urban development and water body maintenance in such areas needs to be urgently addressed. This paper presents an integrated operational approach using a participatory multi-criteria evaluation method based on the understanding of all possible aspects and implications for a rural housing development in a case study compromising a reservoir area. This method was implemented for the case study area located in the mixed rural-urban fringe of Badajoz province, Spain. Priority criteria were investigated by analysing different dynamics which were modelled based on a literature review, expert discussion, internet-based public participation, and objective comparison. In addition, applying the participatory contingent valuation method to water visibility in the priority areas improves the integration of sustainable rural housing, to better balance tourism activity expansion and ecological conservation. This study identified and compared the various interests of public participants by analysing a priority map via a visibility valuation. The assessment results provide a new empirical and valuable management tool to evaluate the existing infrastructure and environment, and to predict their future improvements. It can be applied to other destinations. Thus, this model can be used to ensure sustainable rural housing development in reservoir areas, the main objective being to increase the quality of life for the reservoir's residents as well as tourist satisfaction.

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## 1. Introduction

Rural housing development is related to various interconnected factors, including rural depopulation, counter-urbanisation, economic growth, and social, cultural and environmental sustainability (Tassinari and Torreggiani, 2006; De Vriese et al., 2012; Jeong et al., 2012; Dufy-Jones, 2015). The processes and challenges of planning rural housing have been studied by many researchers previously,

who have also drawn attention to new forms of rural housing (Gallent and Tewdwr-Jones, 2000; Hall and Müller, 2004; Marcouiller et al., 2011; Gkartzios and Scott, 2013). The popular discourse on this topic is closely related to rural environments and the style of living and activities practiced by their residents (Tewdwr-Jones et al., 2002; Satsangi et al., 2010; Jeong et al., 2013, 2016b). Rural communities enjoy the complementary support of the local government in terms of general economic assistance policies and targeted housing support. Previously, the topic of rural studies was regarded as marginal at best and inconsequential at worst; however, we note several critical contributions to the understanding of rural housing issues in the last few years (Milbourne, 2006; Jeong et al., 2012). Particularly, a significant part of recent man-made construction has occurred in rural areas. This has resulted in an increase in their recreational potentiality and

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human migration to these areas, which also matches the urban sprawl seen in the 20th century in the Extremadura region of Spain (Dwyer and Childs, 2004; Van der Wulp, 2009; Jaraíz et al., 2013). Nevertheless, planning for rural housing has not advanced proportionately to deal with these new transitions in rural areas. Thus, careful selection of locations of rural housing to meet certain criteria could moderate negative impacts on rural environments (Tandy, 1979; Bell, 1995; García et al., 2006; Jeong et al., 2014a).

The research presented in this paper describes an integrated operational approach for a rural housing development using a participatory multi-criteria evaluation method based on the understanding of all possible aspects and implications. The criteria depend on a multitude of interrelated variables and determine the priority areas of rural residential construction in a case study area. A case study implementing the proposed method was performed in the Alange reservoir area (the rural–urban fringe of Badajoz province, Spain), which is experiencing significant construction sprawl and development pressure. Following a literature review and discussions with researchers and local experts, the evaluation criteria were selected from a long list that included natural and ecological attributes, socio-economic conditions, and physical location factors (Eastman et al., 1993; Kapetsky and Nath, 1997). The public was invited to complete pair-wise comparisons to generate the weighting matrix through an internet-based survey, which was combined with an economic valuation of water presence visibility. The proposed methodology presented herein is the Analytical Hierarchy Process (AHP) for Multi-Criteria Analysis (MCA), combined with fuzzy standardisation and Simple Additive Weighting (SAW) in a Geographical Information Systems (GIS) environment (Eastman, 2003). This study identified the particular interests of public participants through the analysed suitability map and visibility valuation. Accordingly, the mechanism behind the participation intention can be identified through the results and is instructive towards enhancing participatory attitudes in the integrated and sustainable management of rural housing development in reservoir areas. The suggested approach is described following an extended literature review. Then, it is demonstrated using a case study. The methodology applied in this study appears in Section 3. Section 4 comprises the results and discussion, while Section 5 concludes the paper.

## 2. Selecting priority locations in reservoir areas under tourism: considerations and justifications in terms of rural housing development

In an analysis of the rural housing literature, Milbourne (2006) identified a number of important gaps in our knowledge and comprehension of rural housing. In particular, he noted that there was a need to recognise the extent of the significance of rural housing within the context of human movement to and from rural areas. Thus, traditionally, the literature has a tendency to analyse the political and policy dimensions of rural housing from an institutional standpoint. That is, most studies have predominantly dealt with the formal actors and processes, which affect how rural housing policy is developed and implemented (Hall, 1974; Newby, 1979; Milbourne, 1998; Yarwood, 2002; Hoggart and Henderson, 2005). For instance, in a review of rural housing planning systems, particularly the development of more affordable rural housing, Sibley (1995) discovered that current planning had developed to support construction favouring the rural middle class. In a similar vein, Tewdwr-Jones et al. (2003), Satsangi et al. (2010), Sturzaker (2010), and Sturzaker and Shucksmith (2011) also observed that rural construction had come about much like urban construction, and the latter had been deployed to define rural housing policy in Europe. This is one example of how planning

objectives evolved around the requirement to protect the natural and built heritage of rural landscapes that have been used as a means of constraining housing development in rural areas. Gallent (2007) presented an innovative study which employed the Heideggerian concept of dwelling (1962). He noted how the formal understanding of what it means to 'dwell' in a rural society has been used to criticise second home ownership in existing rural housing and planning policies. While there have been certain significant contributions to the literature on rural housing studies since then, as Milbourne (2006) critically noted, there remains uncertainty in the rural housing literature with regard to the linkages among land use, and economic and place vulnerability in operational rural housing planning.

Besides the literature on rural housing planning, land use planning is a vital field which outlines the significance of the natural landscape and how societies organise their links with nature (McCann, 1997; Hillier, 1998). In addition, land use planning is strongly influenced by political interests, providing different landscape visions and directing planning processes. Competing different visions of land use planning indicate the constellation of economic and social issues that are likely to figure in land use governance (Neumann, 1998; Schroeder, 1999; Hulse and Ribe, 2000). Moreover, planning constitutes more than good policy-making; it highlights competing visions of nature that lead to social and environmental change. Here, planners should recognise that science is not essentially a self-evident product, and that when opponents notice that the ideologies of conservation science conflict with their own standards, they may criticise the science itself (Bryant, 1998; Hurley and Walker, 2004). They may profit by working to comprehend the social meanings that present the political and social power, and by overtly investigating and defending the requirement for new visions. In this sense, with regard to conservation practice including the natural and built heritage in place vulnerability, planners and other professionals seek to identify core solutions in ways that do not rely upon the implementation of a preconceived vision of how to protect or sustainably develop a particular vulnerable location (Whatmore and Boucher, 1993; Hulse and Ribe, 2000). Therefore, this type of approach may necessarily imply wider definitions of what comprises a vulnerable location, and the proposal should go beyond the definition of conservation. When making a decision upon the location for a proposed activity, a planner may conjecture whether the plan would be approved in one county versus another. In addition to current regional law, a planner might attempt to make use of interlinkages among several land uses or infrastructure arrangements, the necessities of each region, and the possibility that there would be a dynamic community organisation to voice disapproval (Robbins, 2004; Duane, 2004; Jaraíz et al., 2013).

In operational terms, collaborative approaches to planning, such as Participatory Spatial Planning (PSP), are gaining credence among decision-makers, such as policy-setters and planners, as well as with the public, such as community groups and civil societies (Cooke and Kothari, 2001; Ribot and Larson, 2005). Participatory approaches in planning can achieve effectiveness and efficiency, as well as relevance and responsiveness at an assumed low cost (McCall and Dunn, 2012). Public participation should promote a sense of ownership; in addition, it should foster a commitment to plan the implementation and to understand the attitude of the public towards the planning principles (Jones, 1990; Jeong et al., 2014b). Public participants' attitude can drive decision-makers to devising more competent and suitable management strategies to address possible conflicts between local resource conservation and economic development (Lai and Nepal, 2006). Although achieving results through public participation in planning takes time and patience, it arguably increases the potential for government actions

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