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Socio-geographic indicators to evaluate landscape Cultural Ecosystem Services: A case of Mekong Delta, Vietnam

Ho Huu Loc [a,b,*], Thomas J. Ballatore [b,c], Kim N. Irvine [d], Nguyen Thi Hong Diep [e], Truong Thi Cam Tien [e], Yoshihisa Shimizu [b]

[a] Center of Water Management and Climate Change, Viet Nam National University, Ho Chi Minh City, Viet Nam
[b] Research Center for Environmental Quality Management, Kyoto University, Kyoto, Japan
[c] Lake Basin Action Network, Moriyama, Shiga, Japan
[d] National Institute for Education, and Nanyang Environment and Water Research Institute, Nanyang Technological University, Singapore
[e] Dept. of Land Resources, College of Environment and Natural Resources, Can Tho University, Can Tho, Viet Nam

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ABSTRACT

Too often, taxonomies treat cultural aspects of Ecosystem Services (ES) as a broadly labeled, residual category after accounting for other utilitarian benefits. Such an approach overlooks several important interrelationships among the largely different integrated components of cultural ES, i.e. recreational, spiritual, education concerns, *etc*. In this paper, the need of more explicit typologies is underscored via a case study, where the authors represented the discrepancies between two tiers of Cultural ES: those associated with Spiritual Values and Recreational Opportunities using a socio-georaphically-based tri-indicator analytical framework. More specifically, two survey-based (*Richness* and *Quality* of ES), and one GIS-based (*Willingness to Travel* (WTT)) indices were proposed to evaluate a full range of cultural benefits derived from seven popular tourism sites of Ha Tien Town, Kien Giang, Vietnam. These numerical indicators pointed out the significant differences between ritual values and recreational based benefits, underlining the crucial need of fuller taxonomies of cultural services within the ES analytical framework. With respect to the study area, the measurements of Quality and Richness detected major synergies and tradeoffs among the evaluated benefits, supporting the need to balance management between developing tourism activities and preserving cultural identity of the landscapes. The last indicator, WTT utilizes map data from OpenStreetMap to produce an objective metric in evaluating landscape quality, taking into account the frequency and the potential costs in traveling to respective sites. This indicator constitutes a reliable and equitable method to represent relevant Cultural ES of landscapes besides the popular yet controversial money-based indices, *e.g.* Willingness to Pay or Willingness to Accept.

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1. Introduction

In recent decades, the concept of Ecosystem Services (ES) has gained considerable attention as an operational approach to integrate the multiple contributions of nature, heretofore disregarded, into the decision-making process (Chan et al., 2012; Costanza et al., 2017). Perhaps the most important contribution of the ES framework is the multidisciplinary approach that combines natural, social and political sciences (Loc et al., 2016). Via a holistic approach to measure nature-derived benefits, the ES concept introduces operational tools to convey conservation messages to a wider audience. Although the integration of ecological and economic epistemologies plays a vital role in ES (Turner and Daily, 2008), such an approach has proved flawed as the term services itself cannot be defined without social considerations. In other words, economic approaches can interpret certain ES, especially provisioning and supporting services in public-friendly metrics, but conversely, hinder the description of cultural components. With specific respect to landscape management, cultural motivators have proved to be of greater influence than commodity production (Plieninger et al., 2012).

Since the infancy stage of ES in the mid-1960s (de Groot et al., 2002), the notion of cultural ES has been referred to non-material benefits that people obtain from ecosystems, and at first, were merely labeled as *Recreation and Culture* (Costanza et al., 1997). The categories of Cultural ES evolved and were broadened into a consolidated framework by MA in 2005, recognizing *Spiritual and*

* Corresponding author.
E-mail address: huuloc20686@gmail.com (L. Ho Huu).

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Religious; *Recreation and Ecotourism*; *Inspirational*; *Sense of Place*; *Cultural Heritage*; and *Educational Services*. More recently, notable scholars such as Daniel et al. (2012) and Chan et al. (2012) have once again raised the crucial need of fuller taxonomies for Cultural ES by describing the major differences among the integral components of Cultural ES and suggesting ways to functionalize the integration of these benefits into the ES assessment frameworks. The shift of paradigm is of particular essence because each component within Cultural ES has distinctive characteristics within specific socio-ecological contexts that can be associated with important synergies and trade-offs in decision-making support.

Like other Ecosystem Services, Cultural ES are vulnerable to external impacts, such as landscape changes or imbalanced management. Their representation, however, lags far behind material services in both research and policy integration, which can lead to biased ecosystem assessment and landscape planning, hampering their integration into conservation policies and threatening the establishment of useful links between ecosystems and human societies (Chan et al., 2011). Difficulties in standardizing definitions and measurements have challenged the accounting attempts of Cultural ES to support decision-making (Hernández-Morcillo et al. 2013). These difficulties mainly emerge from the heterogeneity of Cultural ES among communities, from which the capacity of ecosystems to contribute to a given cultural value substantially fluctuates across beneficiaries' groups and so do their social demands across temporal and spatial scales. Many Cultural ES, especially those associated with religious and spiritual services, have proven difficult to monetize using traditional ES approaches as they do not conform well to economic assumptions, making their assessments complicated in terms of intangibility and incommensurability (Carpenter et al., 2009; Martín-López et al., 2009; Zhang et al., 2010; Chan et al., 2011). Therefore, developing new techniques and unbiased indicators to capture people's perceptions of Cultural ES have been standing challenges for economists, and the ES research community (Kumar and Kumar, 2008).

In other words, to better measure Cultural ES and integrate their values into the overall assessment, certain key questions should be considered: how can Cultural ES be operationally defined? How can they be linked with ecological significances? Most importantly, how can we better classify and characterize relevant values and benefits? Driven by these questions, this paper aims to present a multi-indicator framework to functionalize Cultural ES assessment, which was applied to measure the landscape cultural qualities for a specific study area in the Mekong Delta, Vietnam. With respect to the study area, major findings are expected to constitute meaningful information to support landscape decision-making processes in accounting for social sensitivity and balancing between tourism development and environmental conservation objectives. In so doing, the paper showcases the capabilites of the presented framework in measuring and representing the diversity of the residents' preferences, expectations and demands towards a full list of Cultural ES.

2. Research area

Kien Giang province, in the southwest of Vietnam's Mekong Delta is the broader study area in which we are conducting ES research. This area has a rich history as being a nexus between social, economic, and environmental systems that have interacted for centuries, as colonialism and nation building gave way to the modern Vietnamese state (Biggs, 2012). The rich and intricate balances between social, economic, and environmental systems makes the region a particularly fascinating laboratory. Within this area, Ha Tien Town is specifically relevant to cultural aspects of ES assessment via several landscapes well-known for their natural beauty and historical value, (*e.g.* Tana, 1998; Kiernan, 2010;

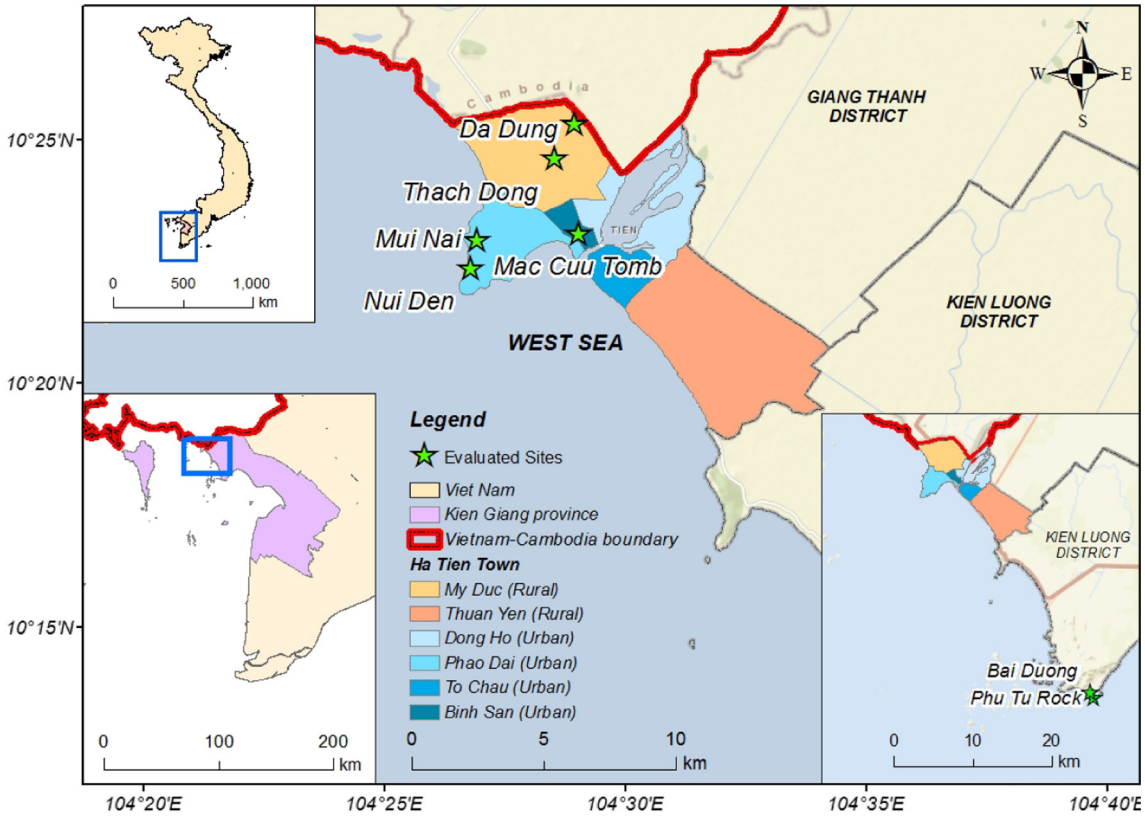

Fig. 1. Location of the research area and the evaluated sites, Vietnam.

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