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Assessing the ability of rural agrarian areas to provide cultural ecosystem services (CES): A multi scale social indicator framework (MSIF)

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ABSTRACT

Assessing the ways in which rural agrarian areas provide Cultural Ecosystem Services (CES) is proving difficult to achieve. This research has developed an innovative methodological approach named as Multi Scale Indicator Framework (MSIF) for capturing the CES embedded into the rural agrarian areas. This framework reconciles a literature review with a transdisciplinary participatory workshop. Both of these sources reveal that societal preferences diverge upon judgemental criteria which in turn relate to different visual concepts that can be drawn from analyzing attributes, elements, features and characteristics of rural areas. We contend that it is now possible to list a group of possible multi scale indicators for stewardship, diversity and aesthetics. These results might also be of use for improving any existing European indicators frameworks by also including CES. This research carries major implications for policy at different levels of governance, as it makes possible to target and monitor policy instruments to the physical rural settings so that cultural dimensions are adequately considered. There is still work to be developed on regional specific values and thresholds for each criteria and its indicator set. In practical terms, by developing the conceptual design within a common framework as described in this paper, a considerable step forward toward the inclusion of the cultural dimension in European wide assessments can be made.

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1. Introduction

It is well established that agricultural and forestry activities in Europe, in addition to providing provisioning services, i.e., food, fuel and fiber, provide a variety of non-material benefits to society. These include cultural ecosystem services (CES) such as: cultural identity; spiritual services (sacred, religious, or other forms of spiritual inspiration derived from ecosystems); inspiration (use of natural motifs or artefacts in art, folklore, etc.); aesthetic appreciation; and recreation and tourism (Burkhard et al., 2009; Cooper et al., 2009; Sayadi and Gonzalez-Roa, 2009 García-Llorente et al., 2012; Pinto-Correia and Kristensen, 2013). Societal demand for these cultural ecosystem services is well documented worldwide (MEA, 2005; OECD, 2006; TEEB, 2010). In the European Union, for example, both the Common Agricultural Policy (CAP Pillar II, Axis 3) and the EU Biodiversity Strategy to 2020 (EU, 2011) recognize societal demand for CES by calling for the "maintenance, restoration and upgrading of the cultural and natural heritage of villages, rural landscapes and high nature value sites". However, despite such policy acknowlement, CES are not explicitly identifiable as policy instruments, but rather tend to be embedded within the landscape concept, with no attempt, for example, to link the maintenance of specific CES to landscape payments. Compounding this policy limitation is a lack of reliable assessment of the contributions of different farming systems, or farming practices, to the "non-material" qualities embedded into different cultural ecosystem services, such as aesthetics, identity or diversity, meaning that these relationships are understood largely in terms of whole landscapes contributing to bundles of CES.

Given that agricultural/rural policy decisions implemented at one scale of governance may have consequences on the delivery of CES at other scales, there have been calls for the application of multi-scale approaches to policy setting and monitoring (Cash et al., 2006; Dick et al., 2014; Lefebvre et al., 2014). The relevant literature on this subject is scarce and this exposes a number of conceptual and methodological difficulties. Foremost among these difficulties is the mismatch between the spatial scale at which environmental processes operate and are measured and the spatial scale at which agricultural management operates, a fact that is often not systematically captured in theoretical frameworks used to link these processes (Pelosi et al., 2010). Particular challenges arise from data aggregation methods and the establishment of indicators, as well as appropriate assessment of linkages across scales (Volk and Ewert, 2011).

Something which particularly needs to be addressed is the question of how to assess and measure different CES at multiple scales of governance. A well-established approach for understanding the ways in which rural agrarian areas provide goods and services to society is that of deriving criteria and indicators for assessing the ability of rural areas to provide such goods. The existing literature on such indicators is vast and the indicators proposed can be broadly categorized into: (i) environmental indicators, for example the United Nations Statistics Division Environmental Indicators (UNSD, 2014); (ii) sustainability indicators (including the social, economic and environmental dimensions); and (iii) landscape indicators (including landscape visual characteristics). The scalability and generalizability of these different classes of indicators varies. While environmental indicators are transferable between sites and regions, landscape indicators cannot be applied everywhere (Cassatela and Peano, 2011). For this reason studies contributing to the very rich body of empirical work assessing visual concepts and attributes for deriving preferences for rural agrarian areas are often framed within the context of specific landscapes (see Section 2.2.1). This fact raises concerns about the generalizability (Cassatela and Peano, 2011) of landscape-based indicators between different scales of analysis, and implies that multi-scale assessment of this class of indicators would be very challenging (van Zanten et al., 2014).

In spite of these limitations, however, this very rich theoretical and empirical work on landscape preferences and perceptions should not be thought of just as a collection of case studies (van Zanten et al., 2014). We argue instead that exploring the diversity of landscape preferences expressed in this literature, through different frameworks, might aid the development of a suitable framework for assessing the roles and values of landscape and its elements in provision of cultural ecosystem services (CES).

There is an extensive body of research on the assessment of the efficacy of public policies and planning approaches for delivering public goods and ecosystem services. However, the majority of the assessment frameworks proposed in this literature focus on fairly familiar environmental constructs, such as land use and water quality (for example, see the EU Common Monitoring Evaluation Framework (EC, 2006)) and do not comprehensively address cultural ecosystem services (Paracchini et al., 2012). With the possible exception of recreation (Paracchini et al., 2014), current indicators fail to provide effective frameworks for either measuring the progress of wider social welfare, or for developing or reforming policy to cope with newly emerging social problems (Ahn et al., 2012). So far, most attempts to include these wider values and services have encountered difficulties when seeking translation into policy. In consequence, none of the frameworks so far suggested have demonstrated their utility for assessing the effectiveness of current policies in delivering various public goods and ecosystem services (Arler, 2000; Turpin et al., 2009; Paracchini et al., 2011; Pinto-Correia et al., 2013).

This research aims to fill this gap by developing a methodological framework to evaluate the ways in which rural agrarian areas provide cultural ecosystem services (CES). We call this approach the Multi Scale Social Indicator Framework (MSIF). In order to address the multi scale issue, the framework distinguishes indicators into two groups based on whether they are: (i) generalizable over all regions (G), or (ii) applicable only to one, or a few, specific regions (RS). In this context, an indicator is considered G if it is possible to apply it throughout Europe, even though its range and thresholds might vary from region to region. To provide examples, an indicator related to olive groves could only be applied in Mediterranean regions, and would therefore be classified as RS, while an indicator related to outdoor recreation is applicable to the whole of Europe and therefore would be classified as G.

This approach is built upon the assumption, supported by some previous studies, that it is possible to capture and assess societal preferences, in the context of the rural agrarian areas, at different spatial scales, ranging from the European, national and regional scales to the landscape and local level (Carvalho-Ribeiro et al., 2013a; Dick et al., 2014). Previous studies, when measuring societal preferences at broader spatial scales, have used a 'top-down' approach, based on use of proxy indicators (mostly environmental indicators), derived from Europe-wide datasets, often integrated into composite indices (for example, see Paracchini et al., 2011, 2012, 2014; Pinto-Correia et al., 2013; Jones et al. this issue). At the local and regional scales, landscape preference surveys (see Section 2.1.2), have used a 'bottom-up' approach, eliciting data through primarily data collection, i.e., surveys, of the preferences of groups that are local to the specific landscape in question (for an example of this approach, see Almeida et al. this issue). However, the problem of bridging these different scales remains unresolved, as is the problem of how to validate the results from broader scale assessments, i.e., based on proxy indicators, while overcoming downscaling issues (Mander et al., 2005). The MSIF attempts to overcome these problems.

The effectiveness of any social indicator framework in capturing preferences for landscape hinges on the extent to which it can