



## Identifying and assessing the potential for conflict between landscape values and development preferences on the Faroe Islands



Tobias Plieninger<sup>a,\*</sup>, Halla Árgarð av Rana<sup>b</sup>, Nora Fagerholm<sup>b,c</sup>,  
Gunnvá Fossaberg Ellingsgaard<sup>b</sup>, Eyðfinn Magnussen<sup>d</sup>, Christopher M. Raymond<sup>e</sup>,  
Anton Stahl Olafsson<sup>b</sup>, Laura N.H. Verbrugge<sup>f</sup>

<sup>a</sup> Social-Ecological Interactions in Agricultural Systems, University of Kassel and University of Göttingen, 37213 Witzenhausen, Germany

<sup>b</sup> Department of Geosciences and Natural Resource Management, University of Copenhagen, 1958 Frederiksberg C, Denmark

<sup>c</sup> Department of Geography and Geology, University of Turku, 20014 Turku, Finland

<sup>d</sup> Faculty of Science and Technology, University of the Faroe Islands, 100 Tórshavn, Faroe Islands

<sup>e</sup> Department of Landscape Architecture, Planning and Management, Swedish University of Agricultural Sciences, 230 53 Alnarp, Sweden

<sup>f</sup> Department of Water Engineering and Management, University of Twente, 7500 AE Enschede, The Netherlands

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### ABSTRACT

Small islands are characterised by geographic isolation, strong place attachment, and vulnerabilities to social, economic, and ecological changes. They are often subject to development activities that raise concerns about impacts on multiple land- and seascape values. This study elicits a range of land- and seascape values, development preferences, and land-use conflicts in a Northern Atlantic islands setting. We do so by linking participatory mapping with narrative analysis techniques to elicit landscape values and development preferences and to identify the potential for land-use conflicts. Four narratives were illustrative of human-nature relationships in the North Atlantic, revealing a great appreciation for wildlife and landforms, for peaceful and undisturbed ecosystems, for open access to land and sea, and for people being part of nature as major themes. The overlay of mapped landscape values and development preferences identified areas with a high potential for future land-use conflicts. Tourism development had a particularly high potential for conflicts. The local narratives on development activities – tourism, renewable energy, and fish farming/processing – confirmed diverging viewpoints. Respondents acknowledged the need for new economic opportunities that may create employment and wealth, but were concerned about negative effects for nature and society and the perceived inability to govern these developments. We argue that planning for multiple landscape values and preferences is crucial to manage the potential for trade-offs in land- and seascape development that is influenced by a range of pressures and drivers of change.

### 1. Introduction

Small islands in the North Atlantic (e.g., Faroe Islands, Shetland, Lofoten) (c.f. Baldacchino and Milne, 2000) are closely coupled social-ecological systems that have discrete boundaries (Martín-López et al., 2017) and display particular human-nature relationships (Flint et al., 2013). These relationships are formed by characteristics of geographic isolation, place attachment, and vulnerabilities (Ankre and Nilsson, 2016; Kaltenborn et al., 2017a). Given these particularities, small islands have often been considered as iconic sites, with lessons to be learnt for interactions between human society and the environment as a whole (Kelman, 2007; Renes, 2014).

Geographic isolation implies that small island societies have traditionally relied on local ecosystem services of the land and the sea. In the past and in part until today, many islands had very intensive forms of subsistence agriculture and extremely small-scale field patterns. Often, crop cultivation has been carried out on sites that would be considered too marginal for agriculture elsewhere. Marine and coastal ecosystem services (in particular, fish stocks) typically complemented agriculture and acted as a safety valve (Renes, 2014). At the same time, small islands are connected to the outer world by trade, although they often suffer from competitive disadvantage because of lesser economies of scale and longer transport times. Also, they are strongly dependent on relationships and support from mainland policies and economies

\* Corresponding author.

E-mail address: [plieninger@uni-kassel.de](mailto:plieninger@uni-kassel.de) (T. Plieninger).

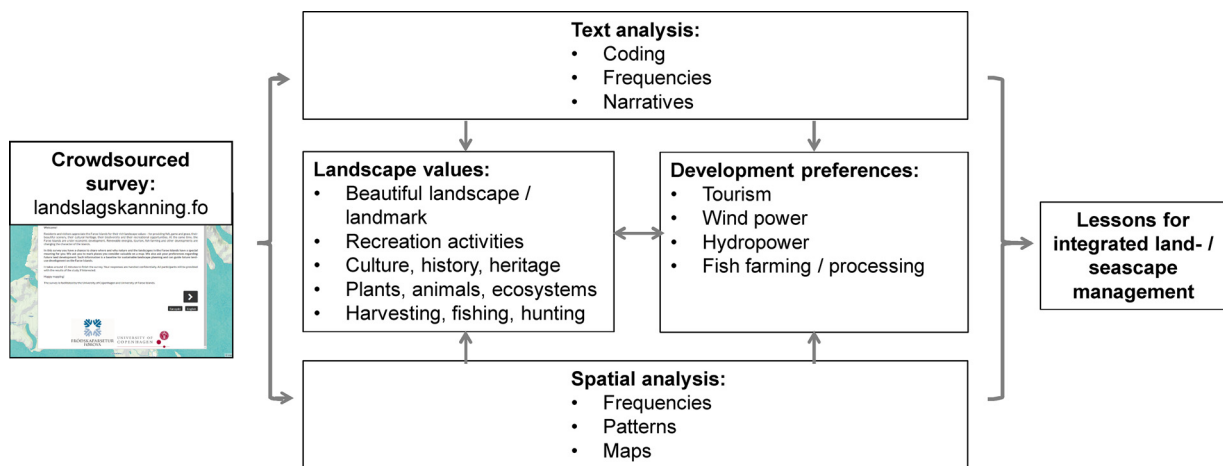


Fig. 1. Crowdsourced approach to assessing landscape values and development options established in this study.

(Kaltenborn et al., 2017a).

In small island communities, isolation and dependence on local ecosystem services typically create high levels of place attachment (Williams and Vaske, 2003) and sense of community (Vallega, 2007). The values derived from the relationship to and the responsibility for nature termed cultural (Bieling et al., 2014) or relational values (Chan et al., 2016) play an important role. Relational values are inclusive and responsive to known aspects of well-being, particularly when addressing how people make decisions and what they care about (Klain et al., 2017). In many situations, these values are stronger than purely utilitarian/economic motivations (Kaltenborn et al., 2017a; Plieninger et al., 2015). In the islands of the North Atlantic, cultural values result from intimate engagement with land and sea through practices and knowledge formed for example around animal husbandry, fishing, harvesting of edible wild plants, or hunting of seabirds, whales, and other wildlife (Vergunst, 2012). Complex rules regulating access to natural resources (including land divisions, usage rights, and land ownership) and comprehensive landscape modifications (e.g., development of infield/outfield systems, soil augmentation) yield evidence that relational values to the land and the sea have evolved over long time scales (Edwards, 2005; Thorsteinsson, 2008).

Being exposed to a harsh and fragile environment, to economic dependence on fishing, and to often poor adaptive capacity, small island communities in the North Atlantic are vulnerable to social, economic, and ecological changes (Brewington, 2016; Guillotreau et al., 2012). Resource depletion (e.g., through overfishing) easily translates into unemployment and business failures, followed by outmigration and substantial changes in the size and composition of island populations (Hamilton et al., 2004). Today, many small islands are particularly impacted by pressures of global environmental change (such as changing climate, rising demand for natural resources, and growing dependence on public support), making them “frontiers of future change, conflict, and opportunity” (Kaltenborn et al., 2017b, p. 29).

Several public policies and private initiatives promote responses to these social-ecological challenges under the umbrellas of “marine spatial planning” (Domínguez-Tejo et al., 2016), “integrated coastal zone management” (Portman et al., 2012), and “integrated landscape management” (Sayer et al., 2013). Integrated management approaches support conservation and restoration of biodiversity, the sustainable extraction of natural resources, the protection of critical ecosystem functions, and improvement of livelihoods as joint objectives in land- and seascapes rather than dealing with them in isolation (García-Martín et al., 2016). Integration of management across sectors, levels of government, uses, stakeholders, and spatial and temporal scales is at their core (Portman et al., 2012). Implementing such approaches requires a profound spatial understanding of the cultural values and conflicts that

people perceive (Gee et al., 2017; Martin et al., 2016). Several qualitative and quantitative methods have been developed to reveal such values and conflicts at land-/seascape level, for example freelifting (Bieling et al., 2014), monetary valuation (Ruiz-Frau et al., 2013), or culturonomics (content analysis of large digital text bodies) (Ladle et al., 2016). Public Participation Geographic Information Systems (PPGIS) have been particularly widely used as they allow putting cultural values on a map (Brown and Fagerholm, 2015).

Here, we link participatory mapping with the use of narratives as a way to inform integrated management of land- and seascapes and to enable a more socially inclusive approach to landscape valuation (Raymond et al., 2014). We aim to identify the potential for conflict between a range of landscape values and development preferences at the scale of an island nation, the Faroe Islands in the North Atlantic. Our specific goals are: a) to reveal spatial patterns and underlying narratives of landscape values in a remote island setting; b) to elicit spatial patterns and underlying narratives of development preferences and the potential for land-use conflicts. Our approach combines quantitative PPGIS and qualitative narrative analysis to gain a both spatially explicit and thematically deep understanding. We expand current qualitative and quantitative analysis of landscape values and ecosystem services by using the same methods for eliciting development options and potential for land-use conflict. Also, we test a crowdsourced form of an online survey at the scale of a small nation, which has been rarely performed in landscape value or ecosystem services assessments (Brown and Fagerholm, 2015). We argue that such approach can inform both the advancement of PPGIS science and public policies toward integrated land-/seascape management on remote islands (Fig. 1). The Faroe Islands provide an understudied yet unique context for illustrating small islands as social-ecological systems with the properties of geographic isolation, place attachment, and vulnerability. Being one of the most fisheries-dependent national economies in the world (Hamilton et al., 2004), the Faroe islands have during the last decades undergone a period of rapid economic development and diversification (tourism, renewable energy, fish farming/processing) that challenges environmental integrity, cultural values, and spatial planning practices.

## 2. Land- and seascape development on the Faroe Islands

### 2.1. Study area

The Faroe Islands are located half-way between Scotland, Iceland and Norway, centred on 62°N and 7°W (Fig. 2). The archipelago consists of 18 islands that can be classified into six socially and ecologically distinct regions (see Appendix A for a characterisation). The total area is 1399 km<sup>2</sup> and the population is 49,864 (2017). The islands are

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