

Ecosystem services and cultural values as building blocks for ‘The good life’. A case study in the community of Røst, Lofoten Islands, Norway

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ABSTRACT

We examined the contribution of natural capital and social capital through the notion of cultural ecosystem services to shaping human well-being in the fishing community of Røst in the Lofoten Islands in Northern Norway. Through ethnographic observations, in-depth interviews, and a participatory scenario workshop we develop four narratives centering on the links of nature and ecosystem services. Benefits derived from ecosystem services are fundamental building blocks in the local vision of ‘the good life’ and emerge from a combination of satisfied preferences and struggle, hardships, and capabilities inflicted by a demanding environment and challenging work conditions. Beyond a certain level of meeting basic needs and provisioning of essential public services, simplicity in life and local control over resources and surroundings was preferred over a multitude of other opportunities and services. Well-being was strongly linked to maintenance of identity through traditional practices for harvesting of natural resources, nurturing of skills, social cohesion, and acting meaningfully in one’s local environment. In a relational perspective, cultural ecosystem services are constituted and given meaning through interaction with nature. The main policy implication is that contributions of natural and social capital to well-being proved to be hard to meaningfully separate.

Key words: ecosystem services; cultural values; well-being; the good life Lofoten; Norway

Kaltenborn, Bjørn Petter; Linnell, John Durrus; Gomez-Baggethun, Erik; Lindhjem, Henrik; Thomassen, Jørn; Chan, Kai M..
Ecosystem Services and Cultural Values as Building Blocks for ‘The Good life’. A Case Study in the Community of Røst, Lofoten Islands, Norway.
Ecological Economics 2017 ;Volum 140. s. 166-176
DOI 10.1016/j.ecolecon.2017.05.003
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1. INTRODUCTION

Island communities are facing multiple challenges in a world of accelerated global environmental and socioeconomic change (Kelman 2007, van der Velde et al. 2007; Guillotreau et al. 2012; Lazrus 2012). Firstly, islands are particularly vulnerable to the impacts of climate change (Lazrus 2012). Secondly, the economies of many coastal communities on islands, which have historically been centered around the harvesting of marine resources, are increasingly pressured by a growing dependency on government support and income from tourism (Brigulio 1995), since few communities can cover the required level of public services by means of local economies. However, environmental and socioeconomic change also opens opportunities for novel development paths (Kerr 2005). Many coastal and island communities face a future where environmental resources and ecosystem services will continue to be pillars in the local economy, albeit in new ways (González et al. 2008).

Islands and island communities have been termed ‘paradoxical’ spaces (Stratford 2003) in that they are local, confined environments with their own particularities, yet are nowadays strongly dependent on relationships and support from mainland policies and economies (Taglioni 2011). They are physically isolated, but still intricately connected with the outside world through modern communication and infrastructure. As with all other spaces, they are subject to the forces of globalization; however, in many cases they are able to maintain a sense of local identity with respect to larger, more dominant neighbors (Vallega 2007).

A major challenge for many island communities is how to blend the best of ‘old times’ (including traditions, culture, local knowledge and identity) with the challenges of centralization and changes in lifestyles (including increasing welfare costs and demands on public services, as well as aging and shrinking populations due to rural-urban migration) so

that it remains possible and attractive to live in these places in a context of increased mobility. Islands sometimes attract artists, nature lovers, and persons seeking a ‘back-to-nature’ lifestyle, but seldom in sufficient numbers to counter declines in traditional professions and migration to urban areas. Although a satisfactory level of economic welfare may well be essential, a whole suite of drivers can influence individual decisions to remain in, move to, or move away from, rural areas. Research has identified many non-economic factors that combine to create a quality of life, which determines the willingness of people to live in remote areas (Fisher and Malmberg 2001). A key question for local politicians and administrators is hence how to maintain or improve the quality of life for inhabitants (Zorondo-Rodríguez et al. 2014).

Island communities can be delimited more easily as discrete social-ecological systems than larger, more complex spaces, and hence lend themselves well to studying nature-society interactions (González et al. 2008). While there are certain forces of change on a general level that can be used to describe what island communities are experiencing, we would argue that precisely because islands are ‘paradoxical’ and idiosyncratic spaces, a qualitative, contextualized inquiry will in many cases be needed. This is largely because we think human-environment interactions are best framed through understanding the relational values people hold in specific places, i.e. what people consider appropriate in terms of how they interact with their surroundings, with other people and how local resources are managed, and to what extent this contributes to well-being (Chan et al. 2016). In this study, we develop narratives and interpret them through a cultural ecosystem services lens and discuss a localized representation of ‘the good life’. We do not assume that the particular perception of well-being found in this research can be extrapolated to other islands and geographic contexts, but we believe that it contains some more systemic level insights that shed light on how cultural

ecosystem services are related to well-being among geographically isolated rural communities more broadly.

In this paper, we draw on data and experiences from the island of Røst in the Lofoten archipelago in northern Norway (Figure 1). Our objective is to add to the growing field of research that examines relationships between ecosystem services and quality of life by including and considering context specific aspects of society and culture. Our focus is on cultural ecosystem services and values, which include a range of non-material benefits people obtain in their interaction with ecosystems through spiritual enrichment, cognitive development, reflection, recreation or aesthetic experience (MA 2005; Chan et al. 2012a). Specifically we examine how important are environmental attributes (natural capital) and ecosystem services perceived to be relative to other societal factors (social and built capital) in shaping a desirable future for a small island community. Based on interviews, ethnographic observations and a participatory scenario workshop we outline four narratives about salient themes in the lives of Røst residents, and use these to schematize how ‘the good life’ is intertwined with ecosystem services and cultural values in the study area.

1.1. Concepts

Research on human experience is often compiled under the term ‘quality of life’ (QOL). Research on QOL bridges several disciplines including sociology, psychology, environmental sciences, medicine, and economics, and utilizes a plethora of objective and subjective measures (Kahneman et al. 1999). Typically, QOL research follows two basic methodologies, one focusing on quantifiable social and economic indicators of the extent that basic human needs are met, and the other using self-reported levels of fulfillment, happiness, and pleasure. The latter falls under the umbrella ‘satisfaction’ or ‘subjective well-being’ (e.g. Kahneman et al. 1999, Layard 2005; Kahneman & Krueger 2006, Agner 2010, Stone &

Mackie 2013). However, in the perspective of this paper we see basic needs and subjective well-being as being intrinsically linked. In practicality, most people will have difficulty in clearly separating their multiple needs into one or the other category of this academic construct. Cultural ecosystem services and associated benefits such as recreational experience of the coastal environment or the cultural heritage of fishing traditions which provide subjective well-being often have a basis in provisioning ecosystem services that supply resources to meet basic human needs (Chan et al. 2012b; Reyes-Garcia et al. 2015). The implication for ecosystem services research is that both subjective assessments and objective realities matter in evaluations of the environment (Marans 2003; Zorondo-Rodríguez et al. 2016). In this paper, we use the term well-being to comprise both subjective and objective dimensions of quality of life. We also speak of the ‘good life in Røst’ as the particular and contextualized version of well-being. Furthermore, in this paper we operate with the concepts ‘environment’ and ‘nature’ which often overlap. The main reason for the lack of definitional rigor is that we use an open, qualitative approach, where the people we study often use these terms in vernacular and idiosyncratic ways. In our conceptual frame of mind, we see ‘environment’ as a broad term encompassing both physical, biological and sometimes social qualities, while ‘nature’ equates more or less the biophysical realm. In describing the local narratives (sections 3 and 4) we have attempted to use these terms as close to what we interpret local meanings to be about particular aspects of the surroundings. Although our focus is on ecosystem services, we also refer to the particular geography of the study area. The reason is that we venture that physical geography needs to be included in the concept of ecosystem services. For instance, services linked to biodiversity can only be properly understood in light of the geographical characteristics of the islands and properties of isolation. The physical properties of the islands allow access to fisheries with subsequent influence on society. Hence, the emphasis on geographical characteristics is both about

enabling activities (exploiting provisioning ecosystem services), as well as building culture and identity (sense of place, community, cultural values, cultural ecosystem services).

Large amounts of research have been conducted to develop a framework for measuring and valuing provisioning, supporting, regulating and cultural ecosystem services (ES) and for linking this to biodiversity conservation, land use and landscape management (for overviews e.g., Van Berkel & Verburg 2014, Satterfield et al. 2013, Daniel et al. 2012, Kareiva et al. 2011, Syrbe & Walz 2012, de Groot et al. 2010, Carpenter et al. 2006). The ES framework promises a useful and holistic approach for analyzing and comparing values and benefits associated with environments and natural resources. However, the concept has also been heavily debated and critiqued for squeezing a highly complex construct representing multiple types of market and non-market values into a single ontology, as well as emphasizing an anthropocentric approach inspired by neoliberal ideology as a one-size-fits-all solution to environmental governance challenges (e.g. Kumar & Kumar 2008, ; Kallis et al. 2013; Satz et al. 2013, Silvertown 2015). This line of critique is particularly strong when it comes to cultural ecosystem services (e.g. Chan et al. 2012a, 2016; Satterfield et al. 2013, Hernandez-Morcillo et al. 2013).

The ES framework originated as an awareness raising tool to illustrate societal dependence on ecological life support systems, then became used as an ecological-economic way of valuing environmental assets (natural capital) and services, and is increasingly being linked to concepts like well-being, quality of life, and identity (Farber et al. 2002, MA 2005, Costanza et al. 2006, Welsch 2009, Tengberg et al. 2012). Cultural ecosystem services address human welfare and rank high on the list of reasons for conservation and sustainable management of ecosystems (Chan et al. 2012a). Non-economic and non-market values can stem from different types of ecosystem services but tend to be lumped into cultural services as a residual category, which often renders them elusive (Chan et al. 2012b). In addition, the

conflation of goods, services, benefits and values, and the consequent inability to treat diverse kinds of values (e.g. market and non-market), complicates decision-making (Chan et al. 2012a).

The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) now explicitly recognizes a ‘good quality of life’ as the core of its conceptual framework (Diaz et al. 2015). Costanza et al. (2006) argues that ‘capital’ in the widest sense of the word, i.e. human, built, social and natural capital, is a useful framework for conceptualizing the factors that shape well-being. While we are aware that the notion of ‘capital’ may not suit well-being discussions in all policy contexts (Gómez-Baggethun & Ruiz-Perez 2011)¹, here we follow the large body of literature that uses different forms of ‘capital’ beyond traditional economics (human, natural, social, built capital) in different forms as a way of describing links between people, the environment and quality of life.

Our overall goal is to explore how the ‘good life on Røst’ relates to the socio-ecological system through linkages between sub-systems of natural, social, and built capital. The overall motivation is to better understand how concepts of well-being and ecosystem services can be related to everyday life and resource use in a rural community and the ecosystem within which it is imbedded. We take an interdisciplinary approach and see ecosystem services and benefits as being constituted through interactions between nature and society. In our discussion, natural capital can sometimes be equated with the broader term ‘ecosystem’ (also including non-utilitarian values related to biotic and abiotic elements of the environment). For resource management in rural areas, human capital is sometimes strongly linked to traditional and local skills and knowledge. And in this particular case, we would

¹ Economic framing of nature as ‘capital’ providing ‘services’ has been problematized as a form of commodification in the discourse to emphasize the importance of using nature metaphors suitable for cultural and policy contexts. Because subsistence and income in the study area are directly dependent on nature, the capital approach is seen to provide an adequate basis to understand the core underpinnings of welfare and well-being.

argue that social capital (networks characterized by trust and cooperation) can create social cohesion and thereby capacity to act collectively and adapt to environmental change. There are subtle, but important differences in how social capital is defined. Our emphasis is on social capital as the networks among people, since networks are particularly critical for human interaction in small communities, while other authors (e.g. Lin et al. 2001) see social capital as the resources that are accessed through networks and relationships. Built capital in an island context embraces a diversity of public services including transport on and off the island, and the full range of public services such as schools, shops, medical care and other social services. Defining well-being as the sum of different types of capital may make empirical sense, but is also conceptually challenging, since there is no adequate way of summing up more or less incommensurable variables.

1.2. STUDY AREA

Our research was conducted in the municipality of Røst, located at the southern end of the Lofoten Islands chain in northern Norway (Figure 1). The Lofoten archipelago consists of a total of 365 islands with a population of approximately 24 000 inhabitants on the seven main islands. To this day, Røst remains one of the focal points in the North Atlantic for the commercial pelagic cod (*Gadus morhua*) fisheries. Between late January and March the island population expands as 400 – 600 boats work the fishing grounds around the islands when large portions of the cod population in the Barents Sea migrate to the Lofoten region to spawn (Christensen 2014). Fishing has been the most important employment sector on Røst and the adjacent islands throughout history, a profession often considered to be among the most dangerous occupations in the world (Høgi 2010). Although safety has increased considerably in recent years, the harsh natural environment and living conditions as well as the working

demands of fishing are associated with high rates of injury and fatalities as well as psychological stress and disorders (Tellnes et al. 2006, Fugelli 1979).

Assessments of the value of ecosystem services in the Barents Sea and Lofoten islands show that there is a lot at stake. The annual commercial value of fisheries, including aquaculture for the three northernmost counties of Nordland, Troms and Finnmark is estimated (2014 figures) to be approximately 1.8 billion euro annually (Directorate of Fisheries 2014). The value of recreational fisheries by residents has been estimated to be in the range of 35 – 100 million euro (Magnussen 2012). Fishing tourism has been estimated to account for in excess of 60 million euro per year (local and external companies, Borch et al. 2011). Other cultural ecosystem services and benefits associated with cultural heritage, whale- and seabird watching, identity, inspiration and spirituality, lack precise estimates to our knowledge, but undoubtedly represent significant contributions to the economy (Kristoffersen & Dale 2014).

Nature based tourism is the other key economic sector. Within the Vesterålen and Lofoten region (2011 figures) there are approximately 180 tourism companies which employ around 800 people. The local annual value generation has been estimated at approximately 40 million euros (Enger et al. 2013). Lofoten is considered a world-class nature tourism destination attracting people from around the globe (Steen Jacobsen & Dann 2003, Mehmetoglu et al. 2010). The particular character of the landscape with its unique blend of rugged mountains, numerous beaches, bays and inlets, and a rich marine environment makes for a unique scenery, which is perceived by domestic and international visitors as awe inspiring, dramatic and beautiful. The cultural history with an active fishing industry, fishing villages and old traditional housing is intricately woven into the experience of the landscape (Steen Jacobsen & Dann 2003). In terms of recreational opportunities, Lofoten offers the full range: hiking, climbing, skiing, seabird and whale watching, fishing, and experiencing

cultural history (Holmefjord 2000). It should be noted however, that Røst differs from the rest of Lofoten in that these islands at the extreme end of the Lofoten chain are fairly flat and far less spectacular than the larger Lofoten islands, at least in a typical touristic sense.

Fishing and tourism have existed peacefully alongside each other for decades, and to some extent depended on one another. The main contemporary policy debate is on whether or not to open the Lofoten region for offshore oil and gas exploration (Buck & Kristoffersen 2011). Petroleum exploitation is seen by many to be incompatible with fishing and tourism due to the risk of oil spills, highly visible production and processing installations, and potentially negative perceptions by tourists (Misund & Olsen 2013).

The majority of the Røst population (551 residents in 2016) live on Røstlandet, which is the largest of the small group of Røst islands. These islands have by any standards a remote location, 100 km west of the mainland town of Bodø. Værøy, the nearest populated island to Røst, lies 25 km to the northeast. Despite a small population and remote location, the main island is serviced daily by planes and ferries. Archeological evidence shows that people have lived on these islands for thousands of years (Wickler & Narmo 2013) due to the extremely rich marine resources. The sea and its resources have provided the subsistence base for this community since time immemorial through the fish in the ocean and the seabirds and eggs in the seabird colonies. Besides the rich fisheries, the Røst archipelago is also well known for being the breeding grounds for one of the world's largest populations of Atlantic puffins (*Fratercula arctica*) and for its nationally important colonies of several other seabirds such as storm-petrels (*Hydrobates pelagicus*), northern fulmar (*Fulmarus glacialis*), common guillemot (*Uria aalge*), razorbill (*Alca torda*), black-legged kittiwake (*Rissa tridactyla*) and European shag (*Phalacrocorax aristotelis*) (Anker-Nilssen 2009).

Contrary to many coastal communities in northern Norway where the number of people employed in Norwegian fisheries has declined by 90 per cent since 1900 (Directorate

of Fisheries 2014), the Røst community has managed to maintain a shore-based fish processing industry in addition to hosting a fishing fleet, which forms the backbone of the local economy. Like most rural regions in Norway, the resident population has declined since the 1960s when the population numbered around 800. Røst faces the same challenges that are almost ubiquitous along the Norwegian coast and many other regions in Europe and beyond, of halting population decline by attracting younger generations to seek work and remain on the islands, and maintaining sufficient public services to keep up a satisfactory welfare level. Seasonal labour migration (mainly workers from Eastern Europe) is currently a prerequisite for running the fish processing industry. This keeps up population numbers for a while, but is probably part of an economic transition, as most foreign workers ultimately aspire to settle in larger towns and cities. On a larger policy scale, Røst also faces the potential problems, opportunities and uncertainties of national reforms to public administration oriented to merge smaller municipalities and regionalize administrative functions.

FIGURE 1 ABOUT HERE

2. METHODS AND DATA

We conducted data collection between September 2014 and October 2015. Our deliberations of salient themes in the islanders' lives and how these are linked to ecosystem services build on different sources. These include existing scientific and popular literature, especially regarding the historical development of the fishing industry and related ecosystem services, and the social, cultural and health/welfare aspects of the wider Lofoten/Vesterålen region, observations in the field, in depth interviews and a participatory scenario workshop with key local residents. Data were collected in three main stages. Firstly, in 2014 we conducted five semi-structured in-depth interviews with key informants among the local

residents in order to collect preliminary information. The aim of the interviews was to obtain background information of how the informants think about the role and importance of environmental attributes relative to other aspects of life in shaping a future that gives room for local interpretations of ‘the good life’. We asked the informants to reflect on their own professions and describe the area’s prime resources, perceptions of drivers of change affecting the island, their impressions of environmental status and trends, key future income sources, and beliefs about the most important choices and priorities the wider Lofoten/Vesterålen region is facing. Interviewees included a whaler, a coastal fisherman, a tourist guide, a hotel owner, and the owner and operator of one of the fish processing plants. These persons were selected as strategic informants based on their position in society and long-term connection to Røst, and represent major resource dependent activities and key economic sectors in the island. The interviews lasted from one to two hours each.

Secondly, we visited the island on five occasions and spent from 2 – 8 days on each visit between 2014 and 2015, which also enabled observations of practice, informal encounters and conversations with public servants (municipality, school), people employed in logistics and transportation, the tourism business, fishing and seabird research. In total, we approached approximately 30 people on these visits.

Thirdly, in September 2015 we conducted a participatory scenario process with twelve Røst residents representing political, administrative, educational and commercial sectors. The main objective of the workshop was to let the participants explore possible futures based on the core question addressed in our research; what constitutes ‘the good life in Røst’, and how do ecosystem services, cultural values and various forms of capital contribute to these preferred futures? We never used the ecosystem services framework, any specific definition of nature or environment, nor any complicated scientific terminology directly, but linked important elements of the good life they identified and discussed in the workshop to

established ecosystem service classifications post hoc. A similar post hoc ES approach has also proved useful in other studies (Gould et al. 2015, Klain et al. 2012, 2014).

We used the GEO framework (UNEP 2007 a, b) in combination with elements from the Adaptive Environmental Assessment and Management (AEAM) approach (Holling 1978, Hansson et al. 1990, Thomassen et al. 2015) as the working structure for scenario development. In short this entails 1) Identifying and selecting participants, 2) Participants identifying their idea of ‘the good life’, articulated as hopes and fears for the future, and their perceptions of key natural and social drivers prior to the workshop, 3) Articulate and decide on 3 – 4 headlines and key messages in respective scenarios, 4) Prioritizing a limited number of critically important drivers, 5) Constructing conceptual maps/models of causes and impacts, and 6), Developing the content of 3-4 scenarios based on alternative development paths and drivers. The scenario workshop can be viewed as a structured focus group session, where the process of exploring scenarios was used to elicit insights into local discourses.

Interviews were carried out with two or three interviewers present where one person had the main responsibility for recording the conversations. After observations and more informal conversations with residents, notes were taken, compared and subsequently edited. The scenario workshop utilized a more structured and formal way of recording discussions, priorities and conclusions through schematic cause-effect charts and written mini-scenarios (Thomassen et al. 2015). Throughout interviews and conversations, we particularly probed issues related to provisioning and cultural ecosystem services and values such as traditional and contemporary harvesting of marine resources, food safety, recreational opportunities, sense of place, cultural heritage, identity, perspectives of future change, aesthetic appreciation and inspiration, and the importance of social relations in coping with a demanding environment.

Based on the material described above we distilled what the residents considered to be the key elements of the good life in Røst and how these relate to the surrounding natural and cultural environment. We cross-referenced interview data with the outputs from the scenario workshop and used observations, informal conversations and existing literature to contextualize our synthesis. We describe this in the form of four condensed narratives that address different aspects of the good life. Clearly, different narratives could have been extracted from this material, and we emphasize that the ones presented below are our interpretations of how the islanders speak about their local environment and the changes that can affect their future.

3. RESULTS

3.1. Hopes and fears for the future

People on Røst are used to a life ‘on the margins’, in several meanings of the phrase. Although the community now enjoys significant state budget support, good public services, and hence important social safety nets, the Røst culture is grounded in hard work for survival, isolation from the outside, and a high degree of uncertainty. Contemporary Røst residents without exception hope they will be able to diversify their employment structure and continue to develop their way of life as a showcase alternative to the increasingly standardized way of life in many urban and near-urban settings. Many hopes and aspirations center on reversing the negative population trend and to some extent attracting newcomers with ideas, skills and other human resources. As one person stated: “We hope that capable people from the outside will settle here. We see that the number of inhabitants is decreasing, but we hope that we can turn this trend with new ideas and resources.” Another islander said: “The Røst community will develop. The community will develop more year-round jobs. This will increase the population. Røst should remain a separate municipality, and we will be ‘masters in our own

house’”. The vision is one of a self-confident, sustainable island community, which remains a separate municipality (there is currently a strong push by the Norwegian government to merge smaller municipalities in Norway) which thrives on diverse year-round employment (pluriactivity). The islanders express pride in remaining on the ‘margins’ geographically, while also developing a strong identity as a modern community with its own particular qualities of close social relations and a clean and providing natural environment.

The uncertainties, or fear, troubling several of the islanders are the exact flipside of this vision; how will domestic and international fisheries policies develop in the future, and how can the commercial sector offer sufficiently numerous and interesting jobs to young people so they don’t leave the islands? Can Røst remain a separate municipality with control over its public services in the on-going statewide revision towards greater administrative centralization? How will climate change and increasing globalization of fish markets affect life on Røst? Can Røst count on politicians to fight for local values?

The ultimate fear is a dystopic future where the population base erodes to a level where important needs can no longer be met. Public services may be diluted or discontinued, the employment base may be reduced and the resilience of the community is badly weakened. One person expressed the fear of losing autonomy in the capacity to satisfy needs locally by stating that “...if we expect that someone will do the job for us.... and ...we fear that the wider society does not see the value of communities like Røst.” Cast as a pessimistic future, some islanders label this a ‘platform society’ evoked by the parallelisms with offshore oil platforms. The fear is that Røst will become a place that merely provides a technical or logistical base for collecting resources from the sea, which are quickly shipped out for processing and value generation in distant locations. In more abstract terms we interpret community capacity, skills, knowledge and social cohesion and a rich environment (ecosystem health and resilience) to be perceived as requisites by the islanders for coping

with the threats and opportunities of an uncertain future. Good transport and communications (by air and sea) were frequently mentioned as prerequisites for community survival, and there were fears that the current level of services could not be taken for granted.

3.2. Nature is all around us

‘We live right in the food bowl’ is a common phrase among the islanders, and an apt description of how the Røst people view their natural environment with its abundant fish stocks. Nature and culture are tightly interwoven in local discourses. The Røst community is largely defined by this human-environment interaction where cultural ecosystem services are intertwined with provisioning services. In the prevailing Røst narrative about nature, the sea itself and seabird colonies are difficult to separate from how livelihoods are constructed and maintained. The following two statements by islanders illustrate the links between nature and well-being, “Nature is special here – lots of sky! – fresh air and a clean sea”, and “First and foremost – it feels good to just look at the sea and the horizon...and then it is really nice to go out there for a while when the weather allows.” But there is also a soberness with respect to the historical role of nature as some statements in a group meeting attest, “The dark season (i.e. the dark winter months due to the high latitude) is greatly overrated.”, “The food that was made in earlier times (largely based on local resources) didn’t taste very good – it was made for survival”, and “It’s a bit scary to aim for a community that is just based on the old ways” (as in former traditions, practices and values).

Natural- and social capital and human resources form a nexus for defining the particular culture of this island community. This nexus, or particular geography if one will, is a powerful representation of the interconnectedness between provisioning- and cultural ecosystem services. In spite of challenges and unpredictability, the rich marine environment seems to instill a sense of security. Almost regardless of what may happen in the outside

world, people on Røst can simply go outside and harvest vital food resources, for an apparently indefinite time. Nature is seen as “clean” – providing high quality food, feelings of identity and well-being, but is also viewed as a powerful external force, which tests the hardiness, skills and capacities of people. Nature inspires through ever-changing light- and weather conditions, instilling awe and wonder in resident islanders as well as visitors. A number of islanders possess considerable local and traditional ecological knowledge and know roughly what to expect in terms of weather patterns through the seasons. But they also have a healthy respect for day-to-day variations and the dangers of storms and rapidly changing weather conditions. Many Røst residents speak of nature both in concrete and symbolic ways as a distinct contrast to the ‘artificial’ urban landscape. Nature is also the arena for stories about the community delivered through the generations concerning the way the landscape creates a sense of place and identity.

Stewardship of the landscape and natural resources is a salient part of this narrative, and represents a clear relational value, like also other recent studies have shown (e.g. Chan et al. 2016). It is a widely shared opinion that the community has managed its environment and resources in a sustainable way throughout history. Externally initiated biodiversity and natural resource conservation measures are perceived to hinder traditional practices and represents a form of ‘madness’ to many (a phrase actually used by several islanders). In the way the locals perceive it, modern management and conservation brings bureaucracy, increases the distance between decision-makers and users, and is seen to devalue local knowledge and traditional concepts of sustainability, which have evolved out of centuries of adapting life and harvesting to local conditions. Many on Røst acknowledge that climate change and other factors impact the seabird populations, and that harvesting of fish- and bird resources must be controlled to some extent. However, the opposition, and to some extent antipathy, in relation to

conservation measures imposed exogenously stems more from the fact that decision makers are far removed from those who live in this particular land- and seascape.

The ban on catching puffins with nets that was introduced in 1951 and subsequent protection of other seabirds has become symbolic for many as an example of the local perception of undesired external constraint on local freedom to act. Some locals perceive that life on Røst becomes more impoverished when they can no longer taste puffin meat, trap the cormorants and nurture the knowledge of how to make delicacies out of local species. It illustrates the complexity of making trade-offs between services when the provisioning and cultural dimensions are strongly intertwined. No one in Røst would like the puffins to disappear. The recognition that local resources can play different roles that are hard to separate is illustrated in the reflections of one of the residents: “If only each family were allowed to harvest maybe 5 birds a year.. people have the right to know what the taste is like.. and that would maybe mean only harvesting 100 birds or so...” And another; “The nature-culture on Røst is disappearing, subsistence is gagged because nature can’t be used in traditional ways.” Ultimately, the narrative goes, the nature-based culture is gradually eroding as subsistence uses dwindle due to externally imposed restrictions. Again, the ecosystem embeds local culture and nurtures social cohesion as an arena for past and present activities that bind people together, and it shows how the particular geography can be both enabling or obstructing and identity building. Local and traditional knowledge expresses identity and opinions about what constitutes legitimate and appropriate uses of the environment and sustainability, as well as a sense of being disparaged by the outside world

3.3. The good life in Røst

Here we construe the concept of “the good life” as a discrete theme, but this topic can be difficult to separate from the narrative about “nature” in Røst. Locals did not articulate a

dual conception of nature as being something separate from culture. Prevailing perceptions of culture and praxis are strongly shaped and defined by the relationship between provisioning and cultural ecosystem services. Many of the qualities and particularities of the Røst community are rooted in the demands and opportunities of the rich natural resources. However, a number of social traits stand out in the local version of “the good life”. Geographical isolation contributes to what is locally perceived as a cultural value. One islander stated: “when people call and ask: is anything going on at Røst?”- I answer: “fortunately not”. The Røst way of life is close-knit, quiet, physically isolated from the outside world, but enjoys good infrastructure and internet connections, and low levels of stress. People know each other and watch out for each other. For example, it was unthinkable that someone would lie alone sick at home for days or weeks without someone checking on them. Several stated that one doesn’t need to be alone on Røst, unless one really wants to. A number of islanders claimed that newcomers are quickly accepted into the community, and that there is a high tolerance level for being ‘different’. One of the locals explained his view of Røst as not being preoccupied with façade: “.. come as you are.. your shirt is nice enough. - and screw the lawn, you can mow that later.” Ultimate, one could argue that a certain level of isolation contributes to identity building, i. e a cultural ecosystem service. However, in other contexts/areas, geographic isolation may well have negative social effects and be a disservice.

Røst inhabitants emphasized high social cohesion and trust as one of the key attributes of the island community. Despite being a small fishing community with an isolated location, many on Røst look to the outside world, and: “the world often comes to visit with interesting experiences” as one local put it, referring to the 15th century shipwreck of Captain Pietro Querini from Venice. This historical event has left a deep impression on the island's identity. Many express pride in the island norm of hospitality towards outsiders. Scenario discussions brought up discourses about "the three circles" of human relationships. The inner circle being

the family and close relatives, the second the circle of friends and acquaintances, and the third the circle which includes fellow members of the island community. Therefore, everyone on the island is viewed as being included in the concept of community and relationships. Days of voluntary collective work (Norwegian: “dugnad”) to get community projects done has traditionally been a trademark of Røst and something the islanders see as a critical spirit to maintain.

Spatial proximity to public services and neighbors are important parts of the quality of life on this island. As is food security through the abundance of local provisioning ecosystem services. And add to this the sense of security with low crime rates, little traffic (there is only one small main road), that kids can play in the street without adult supervision, isolation from urban centers, and the fact, for better and worse, that no one can get away with ill doings anonymously. Historically this community was accustomed to feast as well as famine as the cod fisheries fluctuated. The islanders make few explicit references to links between ecosystem services and well-being, yet perceptions of benefits and negative outcomes of ecosystem services (disservices) exist in the narratives. No one uses the term ecosystem services, and certainly not the distinctions between provisioning-, regulating, and cultural services. Their descriptions of the vital importance of marine food resources, the drastic consequences when they fail, as well as the many fatalities and tragedies that go along with fishing show that this key provisioning service also at times, leads to highly negative outcomes. Yet, these stories also contain references to the awe and inspiration people experience in their closeness to the unpredictable sea, which reflects, in our words, the highly interconnected nature of provisioning and cultural ecosystem services in local well-being. Or in other words, the enabling/obstructing and cultural strengthening effects of the particular geography.

Expressions about the quality of life at Røst also embody these difficulties. Marginal social and natural conditions have taught people to be modest, realistic and patient, but there is no denial that the island has its share of social problems, probably no different from those of most other rural communities. One person described fellow community members as “[...] genuinely mixed people – a mix of good and devilishness [...] real people”. The core of the good life concept in Røst is inclusiveness with room for good and bad in a close-knit social setting in a demanding and rewarding environment. Well-being in Røst is closely linked to strong social cohesion, but also to the positive aspects of geographic isolation (albeit with good air and ferry connections), and the self-help mentality expressed through communal action and maintaining a range of traditional skills and local knowledge.

The local version of well-being expands the view of this concept found in many other studies characterized by a neoclassical economic perspective, where well-being is conceptualized as the sum of satisfied preferences and for which suffering and other types of negative experiences are deficits. In Røst, well-being is a deeply relational notion defined by vibrant links with both nature and people (Chan et al. 2016). Well-being includes struggle and adversity and instills a sense of mastery, confidence and contentment. Moreover, well-being is contingent on social cohesion and cooperation with other community members. A certain simplicity in life is sought over a plethora of opportunities and available services, as is often the case in urban lifestyles. Furthermore, a manageable amount of hardship is not only tolerated, but also embraced with pride.

3.4. The preferred future

The Røst community essentially anticipates and hopes for a future where key elements of the social milieu, the nature of the environment, and local skills and knowledge are maintained. Central to all of these domains is that ecosystem services (such as fishing and

ecotourism) and cultural values (such as community cohesion) are vital pillars in future development of the island community. In this vision, the fundamentals of the ecosystem are maintained—that is, clean terrestrial and marine environments where valuable resources are close at hand and can be utilized for recreational, cultural, subsistence and commercial purposes. A local vision was articulated as: “Røst becomes a national symbol of a society where the alternative to the A4 [standardised] city-life is still possible, without giving up on a modern life.”

Many islanders recognize that climate change and forces of globalization will bring challenges and uncertainties, but hope for a future where a healthy diversity of marine industries develops, while the community manages to preserve and enjoy key aspects of their culture and their well-developed social networks. As one islander said: “The fishing industry must develop and continue to exist. The municipality must show initiatives for developing the Røst community.” Small to medium scale, knowledge-based tourism with nature experiences as the core product is part of the common future vision of economic development. This narrative contains potential trade-offs that have not yet been sufficiently negotiated, for example concerning the extent to which the island should develop its harbor to accommodate cruise ships. Nature and sustainable management of resources are at the heart of this vision, and accordingly oil and gas development is a potentially disturbing and unwanted element in the version of the future for most of the islanders, although opinions about this are mixed. Petroleum exploration remains a divisive question and no doubt has the potential to split the island community and challenge the social cohesiveness that now exists. A classic trade-off between commercial fisheries and the nature tourism sector also looms on the horizon. Future sustainable livelihoods in Røst may depend increasingly on a profitable and competitive fishing industry, which may conflict with the tourism sector’s interest in recreational fishing

and preserving the local landscape, cultural heritage and rich natural environment as cultural ecosystem services.

In sum, the ‘ideal’ future in Røst is portrayed as a community with sufficient human resources to negotiate trade-offs between development options, and also manage negative outcomes of decisions, maintain a diverse employment base to support vital public services, and a strong sense of independence and shared identity across professions and generations. Embedded in this is a strong sense of relational values and the importance of sustainable management of provisioning and cultural ecosystem services. Based on observations, interviews, the scenario process and the narratives developed from these sources, we have summarized the range of cultural ecosystem services and associated benefits identified in Røst in Table 1.

TABLE 1 ABOUT HERE

4. DISCUSSION

Life on Røst has evolved in a demanding natural environment through a challenging way of life based on coastal fisheries. However, the very demands of this human-environment interaction are also a key component of the sense of identity, social cohesion, and robustness of these island environments (Fugelli 2006, Beyer Broch 2013; Kristoffersen & Dale 2014), and hence community capacity to adapt to a changing future (Petzolda & Ratzer 2015; Pettersen 1996). Provisioning and cultural ecosystem services are deeply intertwined and are perceived to be fundamental to well-being through the ecosystem (resources, economy, jobs, land- and seascapes for sustenance and recreation) and their contribution to social cohesion and human resources (heritage, land use traditions, local skills, norms, identity).

As in many coastal settings (Klain et al. 2014), fish are intimately connected to cultural services since the harvesting of fish and other marine resources also yields experiences of maintaining identity, aesthetic- and other types of emotional experiences, and

helps solidify local culture (see e.g. Bell et al. 2001). In our interactions with the islanders, tangible resources like fish (and whales) and other food sources, as well as geological and non-biological aspects of the environment like weather, light conditions and climate tended to dominate the interviews and conversations. Cultural ecosystem services and elements of these were often mentioned more implicitly, which may also reflect our approach and methods. Other studies have elicited a wide range of cultural services through narrative prompts that provoked reflections on values and benefits (e.g. Klain & Chan 2012, Gould et al. 2014, 2015). Habitat and regulating services were mentioned less frequently or in indirect ways. Seabirds were mentioned indirectly and infrequently, and mammals and biodiversity in terms of other organisms were practically absent in the informants' representations.

FIGURE 2 ABOUT HERE

Infrastructure (built capital)—such as docking facilities, processing plants, transportation systems—contributes to well-being by enabling commercial resource extraction and economic development and recreation (Figure 2). The state of existing and desired built capital was frequently mentioned in local narratives. In contrast, while natural capital is such an important part of most peoples' lives that its centrality often seems to be taken for granted, and this may partly explain why it was not articulated more explicitly. At the same time, using an open, semi-structured approach without very specific prompts can be a strength. We did not wish to steer people directly into the ecosystem services framework or jargon, but rather let the informants express their views through their own language, and then make the links to ecosystem services *ex post facto*.

The interdependency between provisioning and cultural services, e.g., the fact that an ecosystem service (e.g. fish) can be provisioning and also have non-material aspects (Chan et al. 2012b), is of great importance to small, resource dependent island communities. How an island community manages its immediate resources and evaluates trade-offs between

ecosystem services, makes decisions about development pathways, e.g. oil and gas versus tourism, and which types of knowledge and technology to adopt, can have profound effects on how the employment base, sovereignty, and welfare situation develop (Vannini & Taggart 2012, Gear 2014). This includes issues and choices like sticking with traditional means of fishing with smaller vessels and coastal fisheries versus investing in larger trawlers as a way of retaining technological sovereignty, i.e. a degree of autonomy and capacity to produce, maintain and develop the tools on which the community depends (Ilich 1973). It can also involve trade-offs between ecosystem services like prioritizing recreational fishing and nature tourism (cultural) over commercial fishing (provisioning), or more likely finding an agreeable balance between both economic sectors. It also involves choices affecting the knowledge base on which economic activity primarily relies (e.g. traditional and local versus technical and scientific) (Gómez-Baggethun et al. 2010), or the difference between processing fish industrially (locally or elsewhere relying on a certain type of technical skills) versus using fish for food tourism and the development of a local gourmet sector that would require a different set of skills and equipment (Bertella 2011). Having sufficient control over the governance system of local resources, rather than feeling overrun and/or alienated by external management institutions and centralized policies can also be crucial, as has been shown in other rural areas (e.g. Bell et al. 2001; Gomez-Baggethun et al. 2013). Preserving options and diversity in terms of the potential of ecosystem services to deliver multiple benefits can be of great importance for the robustness of small communities like Røst.

Well-being is constituted through an interaction between nature and culture to the extent that local culture and identity is largely defined by the environment and the way it is used and experienced. Well-being in the particular Røst version of “the good life” includes a reasonable fulfillment of basic needs like securing a reliable employment base and basic public services (health, school, welfare services, various municipal functions, transport links

to the mainland, broadband internet) and satisfaction with life through experiencing a range of non-monetary values like sense of place, identity, social cohesion, feelings of security, inspiration, fulfillment and contentment. It also rests on a sense of familiarity with a challenging and diverse coastal environment. Finally, a small note of caution. The ecosystem services concept can capture many essential elements of well-being. However, we do not believe that the worldview(s) underpinning the locals' vision of the good life can be fully captured through the ecosystems framework.

There are important direct flows of services from natural, social and built capital to the psycho-social complex of basic needs and well-being, but there are also important linkages between the different elements of the socio-ecological system (Figure 2). Ecosystems contribute to social cohesion by providing a basis for shared values and norms about heritage, aesthetic qualities of the environment, tranquility and recreational opportunities. Social cohesion and shared values not only help define community identity, but also glue people together to perform voluntary communal action and efforts to develop new economic opportunities (Figure 2) (Gomez-Baggethun et al. 2012). Furthermore, we would argue that strong social capital can help the community work on necessary trade-offs between ecosystem services, especially since prioritizing one set of services can lead to degrading other services (Rodriguez et al. 2006). Moreover, degraded services (e.g. overexploiting fish resources) can provide human benefits (at least in the short run), and conversely, protecting some services may limit human benefits (e.g. Horwitz & Finlayson 2011). It is also important in terms of how the community interacts with the outside world and higher administrative levels (region, county, state) to influence policy and budgets to support essential air- and sea transportation and digital networks. Infrastructure, human skills, knowledge and technology affect the ecosystem through land use and environmental impacts, and conversely the ecosystem—via landscape characteristics and the distribution of natural resources—affect how skills and

knowledge are employed. The relationships between natural-, social-, and built capital are reciprocal as developments and changes in one form of capital can have impacts on other forms of capital. For instance, the participants in the scenario process agreed that changes in fish populations (natural capital) due to climate change and/or fishing practices can affect aspirations about future employment opportunities and livelihoods in Røst (social capital). This again can lead to changes in harvesting practices, new skills and new knowledge about the environment (social capital), the need for different marketing, processing and transportation capacities (built capital). All of which interact to shape well-being and community life (Figure 2).

5. CONCLUSIONS

This study shows that research on the link between ecosystem services and well-being should take a broad view of how the concepts are linked. The narratives from Røst emphasize that well-being is a composite of pleasure, challenge and hardships, and the capabilities, solidarities and identities that result. Some research frames well-being in largely economic and utilitarian terms as the aggregate product of benefits derived. One example is how a range of benefits may be derived from the environment like fish, other marine resources like seascapes and landscapes including material (income, food, employment) as well as non-material goals (traditions, preservation of ecological values) (e.g. Stone & Mackie 2013, Weeratunge et al. 2014), all of which are generally considered positive social values. The key finding that emanates from our study is that well-being derives from a broader interaction with the environment that also includes uncertainty, stress, hard work and even danger to human health and safety. Nevertheless, people remain on Røst, implying that personal convictions and world views are more relevant terms than ‘preferences’ in the sense that they embed acceptance and even liking of factors which are often framed as negative aspects of

traditional livelihoods in modern contexts, to the extent that the islanders choose not to leave the island. At least, the more demanding aspects of the environment and the local livelihoods do not outweigh other factors to the extent that people abandon Røst. The collective identity as a resilient people was central to many perspectives we heard and observed. As such, natural capital is valuable not only for its contribution to the *mitigation of vulnerability* (e.g., flood risk), but also for the way it creates *continued exposure to manageable hardship*.

Weeratunge et al. (2014) discuss how concepts of well-being have been influenced by different research approaches like social capital, social well-being, poverty, capabilities, human rights, and economics of happiness, and how this applies to fishing communities. In this study, we derive well-being as a relational concept contingent on acting meaningfully in one's immediate environment, which aligns best with a social well-being approach. In this perspective, to act meaningfully involves a balance between improving opportunities and choices and accepting difficulties, hardships and limits. Identity, sense of place and sense of community are key elements in relational and subjective components of social well-being. In this case it involves a shared body of traditional knowledge, practices and informal institutions shaping interactions with nature, which only makes sense in a relational perspective, i.e. one that accounts for the preferences, principles, and virtues associated with relationships, both interpersonal and as articulated by social norms. A salient implication of this perspective is that standardized and decontextualized typologies of cultural ecosystem services have clear limitations for policy and management, since they are more or less detached from many local systems of meaning. A relational approach recognizes that ecosystem services are constituted and given meaning through interaction with the surrounding environment, rather than existing as exogenous factors. It follows from this that contextualized understandings of ecosystem services are dynamic and open to negotiation between stakeholders.

The first implication for policy and management, is that operational understandings of how ecosystem services relate to well-being need to include broad concepts of human-nature interactions, i.e. encompass biophysical, geophysical and cultural elements, i.e. link the particular physical and human geography. Second, it needs to consider the interdependent relationships between cultural and provisioning services, and the fact that trade-offs between services can imply benefits for some interests and negative outcomes or costs for others. Third, operational ecosystem services concepts must also include elements of social- and built capital, and their dependence on the local natural capital. This elevates the mapping, monitoring, and management of ecosystem services from a decontextualized one-dimensional ecological exercise to a place based, socio-ecological task.

ACKNOWLEDGMENT: We wish to thank the islanders of Røst for their willingness to participate in our study. This study was financed by two grants from the Norwegian Research Council. (Project nrs. 251112, 230307)

REFERENCES

- Angner, E. 2010. Subjective well-being. *The Journal of Socio-Economics*, 39 (3), 361–368.
<https://doi.org/10.1016/j.socec.2009.12.001>
- Anker-Nilssen, T. 2009. Ornithological values of the Lofoten Islands in a world heritage perspective: An update as of April 2009. NINA Minirapport 256, 13 pp.
- Bell, S., Nichersu, I., Ionescu, L., & Iacovici, E. (2001). Conservation versus livelihood in the Danube Delta. *Anthropology of East Europe Review*, 19(1), 11-15.
- Bertella, G. 2011. Knowledge in food tourism: The case of Lofoten and Maremma Toscana
G Bertella - *Current Issues in Tourism*, 14(4), 355-371.
<https://doi.org/10.1080/13683500.2010.489638>
- Beyer Broch, H. 2013. Social resilience – local responses to changes in social and natural environments. *Maritime Studies* 12:6, doi: 10.1186/2212-9790-12-6.
<https://doi.org/10.1186/2212-9790-12-6>
- Borch, T., M. Moilanen, F. Olsen 2011. Sea fishing tourism in Norway – debates, regulations, structure and effects. [In Norwegian]. Northern Research Institute, NORUT, Tromsø, Norway.
- Briguglio, L. 1995. Small island developing states and their economic vulnerabilities. *World Development* 23 (9), 1615–1632.
[https://doi.org/10.1016/0305-750X\(95\)00065-K](https://doi.org/10.1016/0305-750X(95)00065-K)
- Buck, M., Kristoffersen, R. 2011. Boring etter olje og gass i nord. Lokal strid langs nasjonale skillelinjer? *Ottar*, 2, 48–54 (In Norwegian).
- Carpenter, S. R., Bennett, E.M., Peterson, G.D. 2006. Scenarios for Ecosystem Services: An Overview. *Ecology and Society* 11(1), 29 www.ecologyandsociety.org/vol11/iss1/art29.
<https://doi.org/10.5751/ES-01610-110129>
- Chan, K.M.A., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., Gould, R.K., Hannahs, N., Jax, K., Klain, S.C., Luck, G., Martín-López, M., Muraca, B., Norton, B., Ott, K., Pascual, U., Satterfield, T., Tadaki, M., Taggart, J., Turner, N.J. 2016. Why Protect Nature? Rethinking Values and the Environment. *PNAS* 113(6), 1462–1465.
<https://doi.org/10.1016/j.ecolecon.2011.11.011>
- Chan, K.M.A., Guerry, A.F., Balvanera, P., Klain, S., Satterfield, T., Basurto, X., Bostrom, A., Chuenpagdee, R., Gould, R., Halpern, B.S., Hannas, N., Levine, J., Norton, B., Ruckelshaus, M., Russell, R., Tam, J., Woodside, U. 2012a. Where are Cultural and Social in Ecosystem Services? A Framework for Constructive Engagement. *BioScience* 62(8), 744-756.
<https://doi.org/10.1525/bio.2012.62.8.7>

Chan, K.M.A., Satterfield, T., Goldstein, J. 2012b. Rethinking ecosystem services to better address and navigate cultural values. *Ecological Economics* 74, 8-18.
<https://doi.org/10.1016/j.ecolecon.2011.11.011>

Chan, K.M.A., Hoshizaki, L., Klinkenberg, B. 2011. Ecosystem Services in Conservation Planning: Targeted benefits vs. Co-Benefits or Costs? *PLoS ONE* 6(9), e24378.
<https://doi.org/10.1371/journal.pone.0024378>

Constanza, R., Fishera, B., Alib, S., Beerc, C., Bondd, L., Boumansa, B., Danigelise, N.L., Dickinson, J., Elliottc, C., Farleya, J., Gayerg, D.E., MacDonald Glennh, L., Hudspeth, T., Mahoney, D., McCahill, L., McIntosh, B., Reed, B., Turab Rizvi, S.A., Rizzo, D.M., Simpatico, T., Snapp, R. 2006. Quality of life: An approach integrating opportunities, human needs, and subjective well-being. *Ecological Economics* 61, 267-276.
<https://doi.org/10.1016/j.ecolecon.2006.02.023>

Christensen, P. 2014. Norges fiskeri og kysthistorie, bind 4. 1970-2014 (in Norwegian).
Directorate of Fisheries 2014. Statistics for fisheries.
<http://www.fiskeridir.no/English/Fisheries/Statistics>.

Daniel, T.C., Muhar, A., Arnberger, A., Aznar, O., Boyd, J.W., Chan, K.M.A., Constanza, R., Elmqvist, T., Courtney, G.F., Gobster, P.H., Gret-regamy, A., Lave, R., Muhar, S., penker, M., Ribe, R.G., Schauppenlehner, T., Sikor, T., Soloviy, I., Spierenburg, M., Taczanowska, K., Tam, J., von der Dunk, A. 2012. Contributions of cultural services to the ecosystem services agenda. *PNAS* 109(23), 8812-8819.
<https://doi.org/10.1073/pnas.1114773109>

de Groot, R.S., Alkemade, R., Braat, L., Hein, L., Willemen, L. 2010. Challenges in integrating the concept of ecosystem services and values in landscape planning, management and decision making. *Ecological Complexity* 7, 260-272.
<https://doi.org/10.1016/j.ecocom.2009.10.006>

Diaz, S., Demissew, S., Joly, C., Lonsdale, W.M., Larigauderie, A. 2015. A Rosetta Stone for Nature's Benefits to People. *PLOS Biology*. DOI: 10.1371/journal.pbio. 1002040.

Enger, A., Jakobsen, E.W., Grünfeld, L.A., Løvland, J., Kildal Iversen, E., Bøgh Holmen, R. 2013. Sektoranalyse av reiselivsnæringen I Nord-Norge. Menon Business economics, Menon Publikasjon 14/2013, 159 pp. (In Norwegian).

Farber, S.C., Constanza, R., Wilson, M. A. 2002. Economic and ecological concepts for valuing ecosystem services. *Ecological Economics* 41, 375-392.
[https://doi.org/10.1016/S0921-8009\(02\)00088-5](https://doi.org/10.1016/S0921-8009(02)00088-5)

Fischer, P.A., Malmberg, G. 2001. Settled People Don't Move: On Life Course and (Im-) Mobility in Sweden. *International Journal of Population Geography* 7(5), 357-371, September/October 2001.

<https://doi.org/10.1002/ijpg.230>

Fugelli 2006. Doktor på Værøy og Røst – Lege på Utrøst. (In Norwegian: 'Doctor at Værøy and Røst – Medic at Utrøst'). Stamsund: Orkana.

Fugelli, P. 1979. Milieu and Mental Health in a Norwegian Fishing Community. *Psychotherapy and Psychosomatics*, 32(1-4), 60-64,
<https://doi.org/10.1159/000287373>

Gear, R. W. 2014. Island Paths. Divergent fisheries in the Shetland Islands. *The International Journal of Research into Island Cultures*, 8(2), 39-54.

Gómez-Baggethun, E., Mingorría, S., Reyes-García, V., Calvet, L., Montes, C. 2010. Traditional ecological knowledge trends in the transition to a market economy: Empirical study in Doñana natural areas. *Conservation Biology* 24, 721-729.

<https://doi.org/10.1177/0309133311421708>

Gómez-Baggethun, E., Ruiz-Pérez, M. 2011. Economic valuation and the commodification of ecosystem services. *Progress in Physical Geography* 35, 613 - 628.

<https://doi.org/10.1177/0309133311421708>

Gómez-Baggethun, E., Reyes-García, V., Olsson, P., Montes, C. 2012. Traditional ecological knowledge and community resilience to environmental extremes. A case study in Doñana, SW Spain. *Global Environmental Change* 22, 640-650.

<https://doi.org/10.1016/j.gloenvcha.2012.02.005>

Gómez-Baggethun, E., Kelemen, E., Martín, B., Palomo, I., Montes, C. 2013. Scale misfit in ecosystem service governance as a source of environmental conflict. *Society & Natural Resources* 26, 1202-1216.

<https://doi.org/10.1080/08941920.2013.820817>

González, J. A., Montes, C., Rodríguez, J., Tapia, W. 2008. Rethinking the Galapagos Islands as a complex social-ecological system: implications for conservation and management. *Ecology and Society* 13(2): 13. [online] URL:

<http://www.ecologyandsociety.org/vol13/iss2/art13/>

Gould, R., Ardoin, N., Woodside, U., Satterfield, T., Hannahs, N., Daily, G. C. 2014. "The forest has a story: cultural ecosystem services in Kona, Hawai'i." *Ecology & Society* 19.

<http://www.ecologyandsociety.org/vol19/iss3/art55/>

Gould, R. K., Klain, S. C., Ardoin, N. M., Satterfield, T., Woodside, U., Hannahs, N., Daily, G. C., Chan, K. M. 2015. "A protocol for eliciting nonmaterial values using a cultural ecosystem services frame." *Conservation Biology* 29(2): 575–586.

<http://onlinelibrary.wiley.com/doi/10.1111/cobi.12407/full>

Guillotreau, P., Campling, L., Robinson, J. 2012. Vulnerability of small island fishery economies to climate and institutional changes. *Current Opinion in Environmental Sustainability* 4(3), 287-291.

<https://doi.org/10.1016/j.cosust.2012.06.003>

Hansson, R., Prestrud, P., Øritsland, N.A. 1990. Assessment system for the environment and industrial activities at Svalbard. Norw. Polar Research Institute, Report no. 68 – 1990. 267 pp.

Hernández-Morcillo, Plieninger, T., Bieling, C. 2013. An empirical review of cultural ecosystem service indicators. *Ecological indicators* 29, 434-444.

<https://doi.org/10.1016/j.ecolind.2013.01.013>

Holling, C.S. 1978. Adaptive environmental assessment and management. John Wiley & Sons: Chichester- New York - Brisbane - Toronto. 1986. 377 pp.

Holmefjord, K. 2000. “Linking products, industries and place” – synergy effects from the interaction of tourism and other local industries in Lofoten and Hardanger. Working paper No. 85/00. Foundation for research in economics and business administration, Bergen.

Horwitz, P., Finlayson, C.M. 2011. Wetlands as Settings for Human Health: Incorporating Ecosystem Services and Health Impact Assessment into Water Resource Management. *BioScience* 61(9), 678-688.

<https://doi.org/10.1525/bio.2011.61.9.6>

Høgi, M. 2010. Risky businesses: a perspective on fishers' risk in the oil versus fish dilemma in Lofoten and Vesterålen. Masters thesis, International Fisheries Management, Norwegian College of Fisheries Science, University of Tromsø, Norway.

Illich, I. 1973. Tools for conviviality. New York: Perennial Library, Harpers & Row.

Kahneman, D., Krueger, A.B. 2006. Developments in the Measurement of Subjective Well-Being. *The Journal of Economic Perspectives*, 20(1), 3-24(22)

Kahnemann, D., Diener, D., Schwarz, N. (eds.) 1999. Well-Being: The Foundations of Hedonic Psychology. Russel Sage Foundation, New York.

Kallis, G., Gómez-Baggethun, E., Zografos, C. 2013. To value or not value? That is not the question. *Ecological Economics* 94: 97-105.

<https://doi.org/10.1016/j.ecolecon.2013.07.002>

Kareiva, P., H. Tallis, T. H. Ricketts, G. C. Daily and S. Polasky (2011). Natural Capital: Theory & Practice of Mapping Ecosystem Services. Oxford, UK, Oxford University Press.

<https://doi.org/10.1093/acprof:oso/9780199588992.001.0001>

Kelman, I. 2007. Sustainable Livelihoods from Natural Heritage on Islands. *Island Studies Journal*, 2(1), 101-114.

Kerr, S. A. 2005. What is small island sustainable development about? *Ocean and Coastal Management* 48(7-8): 503-524.

<https://doi.org/10.1016/j.ocecoaman.2005.03.010>

Klain, S., Satterfield, T., Chan, K. M. A. 2014. "What matters and why? Ecosystem services and their bundled qualities." *Ecological Economics* 107: 310-320.

<http://www.sciencedirect.com/science/article/pii/S0921800914002730>

Klain, S. C., Chan, K. M. A. 2012. "Navigating coastal values: Participatory mapping of ecosystem services for spatial planning." *Ecological Economics* 82(October): 104-113.

<https://doi.org/10.1016/j.ecolecon.2014.09.003>

Kristoffersen, B., Dale, B. 2014. Post Petroleum Security in Lofoten: How identity matters. *Arctic Review on Law and Politics*, vol. 5, 2/2014 pp. 201–226.

Kumar, M., Kumar, P. 2008. Valuation of the ecosystem services: A psycho-cultural perspective. *Ecological Economics* 64, 808-819.

<https://doi.org/10.1016/j.ecolecon.2007.05.008>

Layard, R. 2005. *Happiness: Lessons from a New Science*, New York: Penguin Press.

Lazrus, H. 2012. Sea Change: Island Communities and Climate Change. *Annu. Rev. Anthropol.* 41, 285-301

<https://doi.org/10.1146/annurev-anthro-092611-145730>

Lin, N., Cook, K., Burt, R.S. 2001. *Social capital: Theory and research*. New York: Aldine de Gruyter.

<https://doi.org/10.1017/CBO9780511815447>

MA, Millennium Ecosystem Assessment. 2005. *Ecosystem and Human Well-being: Synthesis*, Island Press.

Magnussen, K. 2012. Marine Ecosystem Services in the Barents Sea and Lofoten Islands, a scoping assessment. In: Kettunen, M., Vihervaara, P., Kinnunen, S., D'Amato, D., Badura, T., Argimon, M. & Ten Brink, P. (eds.) 2012. *Socio-economic importance of ecosystem services in the Nordic Countries. Synthesis in the context of The Economics Ecosystems and Biodiversity (TEEB)*, Nordic Council of Ministers, Copenhagen TemaNord 2012:559, 262-267.

<https://doi.org/10.6027/TN2012-559>

Marans, R.W. 2003. Understanding environmental quality through quality of life studies: the 2001 DAS and its use of subjective and objective indicators. *Landscape and Urban Planning* 65, 73-83.

[https://doi.org/10.1016/S0169-2046\(02\)00239-6](https://doi.org/10.1016/S0169-2046(02)00239-6)

Mehmetoglu, M., Dann, G.M.S., Larsen, S. 2001. Solitary Travelers in the Norwegian Lofoten Islands: Why Do People Travel On Their Own? *Scandinavian Journal of Hospitality and Tourism*, 1(1), 19-37.

<https://doi.org/10.1080/15022250127794>

Misund, O.A., Olsen, E. 2013. Food for Thought. Lofoten-Vesterålen: for cod and cod fisheries, but not for oil? *ICES Journal of Marine Science*, 70(4): 722-725. Doi: 10.1093/icesjms/fst086.

<https://doi.org/10.1093/icesjms/fst086>

Pettersen, L.T. 1996. Crisis Management and Household Strategies in Lofoten: A Question of Sustainable Development, *Sociologia Ruralis*, 36(2), 236–248, August 1996.

<https://doi.org/10.1111/j.1467-9523.1996.tb00019.x>

Petzolda, J., & Ratter, B.M.V. 2015 . Climate change adaptation under a social capital approach – An analytical framework for small islands. *Ocean & Coastal Management* 112, 36–43.

<https://doi.org/10.1016/j.ocecoaman.2015.05.003>

Reyes-García, V., Menéndez-Baceta, G., Aceituno-Mata, L., Calvet-Mir, L., Garnatje, T., Gómez-Baggethun, E., Acosta, R., Rodríguez Franco, R. Domínguez, P., Vallès, J., Pardo-de-Santayana, M. 2015. From famine foods to delicatessen: Interpreting trends in the use of wild edible plants through cultural ecosystem services. *Ecological Economics* 120, 303–311.

<https://doi.org/10.1016/j.ecolecon.2015.11.003>

Rodriguez, J.P., Beard, T.D., Bennett, E.M., Cumming, G.S., Cork, S.J., Agard, J., Dobson, A.P., Peterson, G.D. 2006. Trade-offs across Space, Time, and Ecosystem Services. *Ecology and Society* 11(1), 28. <http://www.ecologyandsociety.org/vol11/iss1/art28/>.

<https://doi.org/10.5751/ES-01667-110128>

Satterfield, T., Gregory, R., Klain, S., Roberts, M., Chan, K.M. 2013. Culture, intangibles and metrics in environmental Management. *Journal of Environmental Management* 117, 103-114.

<https://doi.org/10.1016/j.jenvman.2012.11.033>

Satz, D., Gould, R.K., Chan, K.M.A., Guerry, A., Norton, B., Satterfield, T., Halpern, B.S., Levine, J., Woodside, U., Hannahs, N., Basurto, X., Klain, S. 2013. The Challenges of Incorporating Cultural Ecosystem Services into Environmental Assessment. *AMBIO*, 42, 675-684.

<https://doi.org/10.1007/s13280-013-0386-6>

Silvertown, J. 2015. Have Ecosystem Services Been Oversold? *Trends in Ecology & Evolution*. [Dx.doi.org/10.1016/j.tree.2015.08.007](https://doi.org/10.1016/j.tree.2015.08.007).

<https://doi.org/10.1016/j.tree.2015.08.007>

Steen Jacobsen, J.K, Dann, M.S.G. 2003. Images of the Lofoten Islands. *Scandinavian Journal of Hospitality and Tourism*, 3(1), 24-47.

<https://doi.org/10.1080/15022250310002412>

Stratford, E. 2003. Flows and Boundaries: small island discourses and the challenge of sustainability, community and local environments. *Local Environment*, 8(5), 495-499.
<https://doi.org/10.1080/1354983032000143653>

Stone, A.A., Mackie, C. (eds.) 2013. *Subjective Well-Being: Measuring Happiness, Suffering, and Other Dimensions of Experience*. The National Academies Press, Washington, D.C.
www.nap.edu.

Syrbe, R., Walz, U. 2012. Spatial indicators for the assessment of ecosystem services: Providing, benefitting and connecting areas and landscape metrics. *Ecological indicators* 21, 80-88.
<https://doi.org/10.1016/j.ecolind.2012.02.013>

Taglioni, F. 2011. Insularity, Political Status and Small Insular Spaces. *The International Journal of Research into Island Cultures*, 2011, 5 (2), 45-67.

Tellnes, G., Lund, J., Sandvik, L., Klouman, E., Ytterstad, B. 2006. Long-term effects of community-based injury prevention on the island of Værøy in Norway: A 20-year follow up. *Scandinavian Journal of Public Health*, 34, 312-319.
<https://doi.org/10.1080/14034940500414774>

Tengberg, A., Fredholm, S., Eliasson, I., Knez, I., Saltzman, Wetterberg, O. 2012. Cultural ecosystem services provided by landscapes: Assessment of heritage values and identity. *Ecosystem Services* 2: 14-26.
<https://doi.org/10.1016/j.ecoser.2012.07.006>

Thomassen, J., Kaltenborn, B.P., Linnell, J.D., Lindhjem, H. 2015, Scenarioutvikling på Røst. Rapport fra scenarioutviklingsseminar Røst 1. - 2. September 2015. NINA Rapport 1190. 42 pp.

UNEP 2007a. GEO Resource Book: Training Module 1. The GEO approach to integrated environmental assessment. 29 pp. <http://www.unep.org/geo>. or <http://www.iisd.org/measure>

UNEP 2007b. GEO Resource Book. Training Module 6. Scenario development and analysis. 39 pp. www.unep.org/dewa/Docs/geo_resource/FINAL_GEO_Mod6_06_qx.pdf

Van Berkel, D.B., Verburg, P.H. 2014. Spatial quantification and valuation of cultural ecosystem services in an agricultural landscape. *Ecological indicators*. 37, 163-174.
<https://doi.org/10.1016/j.ecolind.2012.06.025>

Vallega, A. 2007. The role of culture in island sustainable development. *Ocean & Coastal Management* 50(5-6), 279-300.
<https://doi.org/10.1016/j.ocecoaman.2007.02.003>

Vannini, P., Taggart, J. 2012. Doing islandness: a non-representational approach to an island's sense of place. *Cultural geographies*: 1-18. DOI: 10.1177/474471142098.

van der Velde, M., [Green](#), S.R., [Vanclooster](#), M. and [Clothier](#), B.E. 2007. Sustainable development in small island developing states: Agricultural intensification, economic development, and freshwater resources management on the coral atoll of Tongatapu. *Ecological Economics* 61(2–3), 456–468.

<https://doi.org/10.1016/j.ecolecon.2006.03.017>

Welsch, H. 2009. Implications of happiness research for environmental economics. *Ecological Economics* 68, 2735–2742.

<https://doi.org/10.1016/j.ecolecon.2009.06.003>

Weeratunge, N., Béné, C., Siriwardane, R., Charles, A., Johnson, D., Allison, H.A., Nayak, P.K., Badjeck, M.C. 2014. Small-scale fisheries through the wellbeing lens. *Fish and Fisheries*, 15, 255–279.

<https://doi.org/10.1111/faf.12016>

Wickler, S., Narmo, L.E. 2013. Tracing the Development of Fishing Settlement From the Iron Age to the Modern Period in Northern Norway: A case Study From Borgvær in the Lofoten Islands. *Journal of Island and Coastal Archeology* 9, 72–87.

<https://doi.org/10.1080/15564894.2013.810678>

Zorondo-Rodriguez, F., Gómez-Baggethun, E., Demps, K., Ariza-Montobbio, P., García, C., Reyes-García, V. 2014. What defines Quality of Life? The gap between public policies and locally defined indicators among residents of Kodagu (India). *Social Indicators Research* 115, 441–456.

<https://doi.org/10.1007/s11205-012-9993-z>

Zorondo-Rodríguez, F., Grau-Satorras, M., Kalla, J., Demps, K., Gómez-Baggethun, E., García, C., Reyes-García, V. 2016. The role of natural and economic capital on subjective well-being: Empirical evidence from a small-scale society in Kodagu (Karnataka), India. *Social Indicators Research* 127(2):919–937. DOI 10.1007/s11205-015-0975-9

<https://doi.org/10.1007/s11205-015-0975-9>

Table 1. Cultural ecosystem services and benefits identified in Røst.

<i>Cultural services and benefits</i>	<i>Description</i>	<i>Benefits for well-being</i>
Ecotourism and recreation	Seabird safaris, fishing trips, nature walks, providing economic income through tourism and pleasurable activities for residents	A greater diversity of financial income and seasonal employment, increased knowledge about the environment, relaxation, physical and psycho-social fitness, reduced illnesses, contact and interaction with other people
Local and traditional knowledge of marine resources	Local knowledge and practices for harvesting fish, birds, eggs, seaweed and other resources	Maintains traditional skills and knowledge, sense of worth and physical and mental health through harvesting of vital food resources and provision of economic income
Sense of place	Cognitive knowledge about surroundings, emotional attachment and appreciation of place	Feelings of belonging and attachment, sense of identity, and particularities of place, appreciation of geographic isolation and being ‘protected’ from urbanization.
Social cohesion	Social groups emanating from co-location and cooperation through human-environment interactions	Sense of belonging to in-groups, capacity for communal voluntary actions (“dugnads”) and informal activities, individual support during times of difficulty, low crime rates, sense of security, hospitality toward out-group members.
Cultural heritage and historical values	Narratives and physical remnants of past and earlier praxis	Understanding of origins, development paths, and forces of change. Insights about one’s own place in the world, how local norms, identities, knowledge and skills have developed.
Scenery and landscape	Perception of mountains, sea, shorelines, birdlife, fish, mammals, seasonal variation in light, northern lights during winter	Aesthetic appreciation, feelings of awe, satisfaction and inspiration, contemplation, cognitive knowledge.

FIGURE CAPTIONS

Figure 1. Location of study area.

Figure 2. Conceptual model of relationships between natural-, social-, built capital, ecosystem services and well-being emanating from four narratives in Røst.



