VALUECHANGE: Valuation of Cultural and Environmental Goods for Integrated Assessment and Decision-making: From Promise to Practice [Revised version 19.01 2018]

1. Relevance to the Miljøforsk call

This interdisciplinary project rooted in economics, with contributions from natural sciences and heritage studies, aims to assess, value and integrate the importance (values) of cultural and environmental goods for social welfare in a rural-urban context. Including such values in cost-benefit analysis, impact assessments and spatial planning is essential for better informed integrated and holistic decision-making. The project will generate knowledge of a comprehensive set of values of environmental and cultural goods, a necessity for understanding actual and perceived trade-offs between different uses and users of these goods on spatial and temporal scales. We will investigate how people's preferences and the pressures on scarce resources are both changing because of urbanisation in Norway. We will then assess the implications of these changes for values of cultural and environmental goods, and for policy solutions and decision-making in representative rural and urban areas. As such, the project directly addresses the three call themes: "Change processes and impacts of urbanisation for biodiversity, cultural heritage values, landscapes and other environmental goods, with emphasis on integrated solutions", "Valuation of environmental goods and integrated decision-making processes", and "Solutions that can handle the cumulative environmental effects and contribute to a more integrated consideration of the value of biodiversity, cultural heritage and other environmental goods." In addition, the project analyses solutions that emphasise the potential for value creation, addressing the final call theme. A core team of leading researchers from Statistics Norway (SSB), Norwegian University of Life Sciences (NMBU), Norwegian Institute for Cultural Heritage Research (NIKU), Norwegian Institute for Bioeconomy Research (NIBIO) and Menon Center for Environmental and Resource Economics (MERE) will implement the project. A PhD researcher is proposed in the project, co-funded by MERE and affiliated with NMBU. An interdisciplinary expert group with distinguished international participation will provide research guidance, peer review and share experiences with practical use of valuation from Europe and North America. Finally, the Directorate for Cultural Heritage, the Culture Heritage Fund, Design and Architecture Norway (DOGA), WWF, Norwegian Recreational Home Owner Association, Norwegian Agriculture Association, Environment Agency (all confirmed per January 2018) represent user interests in an actively involved user panel.

2. Aspects relating to the research project

2.1 Background and status of knowledge

Ecosystem services and cultural heritage: The problem of un(der)valued goods: Ecosystem services (ES), defined as "the benefits people obtain from ecosystems", are often grouped into the four categories of supporting (such as nutrient cycling), regulating (such as control of climate and disease), provisioning (such as production of food and timber) and cultural ES (termed "CES") (MEA 2005). CES is a wide category of services, sometimes simplified into landscape aesthetics, cultural heritage, recreation and tourism, and spiritual, religious and educational significance of nature (Daniel et al. 2012; CICES 2017, Kumar 2010). Further, biodiversity may be important for people directly and placed as a CES, in addition to being an important part of supporting services (Lindhjem et al. 2015; Mace et al. 2012; Graves et al. 2017). Human-made structures such as tangible cultural heritage, in the same way as abiotic parts of natural systems, are usually not considered part of the ES concept (Hølleland et al. 2017; Potschin et al. 2016). However, for research and practical policy, and for the people who derive use and non-use values[1] from both types of goods, this distinction is not particularly useful, since cultural and natural (incl. abiotic) elements are closely interlinked, for example in a cultural landscape (TemaNord 2015). Hence, we choose to use the broader term "cultural and environmental goods", referring to CES and a broad interpretation of cultural heritage goods. The central point here is that many of these goods and services are public goods that are usually not sufficiently valued and therefore typically not included in private and public decisions (Champ et al. 2017). This in turn typically leads to their overuse and degradation (Kumar 2010). In recent years, there has been an international effort to seek to better "recognize, demonstrate and capture" such values in decision-making (Kumar 2010, Daily et al. 2009). However, while research on regulating and provisioning services have developed quite far,

[1] Non-use value is the value that people assign to goods even if they never have and never will use (e.g. related to existence and bequest) (Champ et al. 2017).

CES have not yet been adequately defined or integrated into the ES framework (Daniel et al. 2012; Blicharska et al. 2017; Hernandez-Morcillo et al. 2013; Hirons et al. 2016; Milcu et al. 2013). Hence, significant research remains both in more reliably assessing (e.g. using indicators) and valuing such services in monetary and non-monetary terms, and integrating such values in cost-benefit analysis, spatial planning and ultimately in decision-making. In Norway, there is currently a strong demand from several sector authorities to operationalise this framework, also within the cultural heritage sector (e.g. Ulstein et al. 2017; Gierløff et al. 2017). Contributing to filling this important research gap, while also satisfying an urgent management and policy need, is the main aim of this project.

Cultural and environmental goods in the context of urbanisation and centralisation: The urgency of increasing our knowledge of such values is amplified by urbanisation. Despite an active rural policy in Norway, urbanisation and centralisation are still strong trends. In 2016, 81 per cent of the population lived in small or large urban centres, up from around 65 per cent in 1970 (SSB 2017). The populations grow the most around the biggest cities, adding pressures on already scarce green infrastructure, cultural heritage and agricultural land on the fringes (NIBIO 2017). In rural areas, where agriculture and traditional resource-based sectors are in decline, e.g. cultural landscapes and biodiversity dependent on grazing, are being recaptured by forests and transformed. New industries related to tourism and recreation have become increasingly important to the rural economy (Velvin 2014). While some tourism may contribute to keeping rural communities alive and vibrant, increased tourism, such as the building of recreational homes also contributes to land conversion and fragmentation of landscapes impacting biodiversity and the landscape aesthetic (Haagensen 2014). At the same time, when conservation supports adaptive re-use of heritage sites this may generate higher values than passive protection (Wright and Eppink 2016). From an economic point of view, urbanisation affects both the supply of cultural and environmental goods along the rural-urban gradient, and the demand and values of these goods. In and around urban areas, the total use values of cultural and environmental goods become more important, and urban populations' values and preferences for maintaining *rural* cultural and environmental goods may also change as a result of urbanisation. Academic research is relatively scarce on the effects of urbanisation on the values of cultural and environmental goods. The economic valuation literature has studied spatial variations in values, e.g. how distance from a change in the quality or quantity of a good affects use and non-use values (so called distance decay) or how values are distributed between groups and place of residence (e.g. Bateman et al. 2006; Johnston et al. 2015). Several studies show the importance of non-use values for iconic or nationally or regionally important landscapes, nature reserves or cultural heritage sites (e.g. Lindhjem et al. 2015, Carson et al. 2013, Navrud and Ready 2002). In addition, the literature has to some extent studied changes in preferences and values over time, though not directly related to urbanisation (Carson et al. 1997; Lindhjem et al. 2014).

The promise of valuation of cultural and environmental goods: Recognizing the need for more effective management of such goods in the context of urbanisation, the operationalisation of the ES framework is on the rise in many sectors nationally and internationally (e.g. Schaefer et al. 2015). Implementation of this framework, including considerations of cultural heritage in a broader sense, requires a good understanding of how cultural and environmental assets provide services; how this provision is distributed in space (e.g. along the rural-urban gradient) and time, how human activities affect these services; and how to reliably assess their value. The latter is necessary for making trade-offs among various human uses, including both conservation and economic development, in specific areas (White et al. 2012). The ES framework promotes a more holistic thinking, motivated by the need to develop more integrated approaches to resource management and to better account for human welfare and livelihoods implications (NOU 2013; Egoh et al. 2007, Grimsrud and Greaker, 2013). Yet, significant research challenges remain in the refinement of valuation methods, the inclusion of CES and cultural heritage values in cost-benefit analysis (CBA), and in the amendment of the current CBA and spatial planning frameworks, for valuation to rise from its current promise to wider practical use (Guerry et al. 2015; Laurans et al. 2013).

Research challenges in monetary valuation: Some goods are traded in markets and can be valued in monetary terms based on market prices (e.g. culture tourism). Other services have no market prices, and can only be valued by use of non-market valuation methods (Champ et al. 2017). These include revealed preference (RP), stated preference (SP), and benefit transfer (BT) methods. RP methods use observational data on decisions people make in markets to estimate the value of changes in a service flow. RP methods include among others the travel cost method (TCM) to estimate recreation and visitation benefits and the hedonic pricing method, for example used to estimate the influence of cultural heritage, environmental amenities and other factors on prices of houses and recreational homes (Gibbons et al. 2014). SP methods, on the other hand, use data

generated from surveys eliciting people's contingent preferences in constructed (hypothetical) market scenarios, and include contingent valuation (CVM) and choice experiments (CE). The aim of the SP methods is to estimate the affected population's willingness to pay, directly or indirectly, to obtain a positive stream of services or avoid further reduction. SP is the only method that can capture non-use values, that may be important for biodiversity and generally a range of natural and cultural heritage goods. A third group of (secondary) valuation methods is BT (Johnston et al. 2015; Lindhjem and Navrud 2008). BT uses value information from existing studies or data in the literature to transfer to a relevant policy context in need of such information. BT is a much-used method in practice and may be precise enough in some contexts. While the valuation methods have been tried and tested for many years, applications using the ES framework fully, or addressing intangible elements of CES and cultural heritage goods, are relatively scarcer (Kumar 2010; Daniel et al. 2012). Applications to certain cultural heritage goods, such as built monuments, are rare and in Norway almost non-existent (see e.g. Navrud and Ready 2002; Rizzo and Mignosa 2013). The literature calls for more careful validity testing and triangulation of the methods to achieve higher level of precision and credibility, especially for SP methods since these are hypothetical by nature (Kling et al. 2012, Haab et al. 2012). In addition, challenges remain in conducting valuation studies that are specifically designed for decision-support, CBA and spatial planning, not just awareness raising in general (Kumar 2010), and that deal directly with complex issues that arise in practical contexts (Pearce 2005). Scientific uncertainty, spatial explicitness and variability, and temporal stability of values, definition of affected populations and aggregation over both use and non-use values, are important questions also for management of cultural and environmental goods (Champ et al. 2017). Many of these questions are of specific relevance in the context of urbanisation, e.g. the spatial distribution of values. Moving research into resolving both methodological and practical challenges in non-market valuation is seen as one of the most important frontiers of ES research (Guerry et al. 2015) and non-market valuation research in general (Pearce 2005).

Non-monetary valuation methods: The intangible nature of some CES and the limitation of some of the monetary valuation methods, underscore the importance of also using non-monetary methods to bring out the complete range of values attached to cultural and environmental goods (Hirons et al. 2016; Milcu et al. 2013). These methods do not rely on monetary metrics or market logics, but examine the fundamental needs and importance people attach to cultural and environmental goods for e.g. a "good life" or their stated subjective well-being (Christie at al. 2012; Jarvis et al. 2017). The term socio-cultural values may be defined as: *"the importance people, as individuals or as a group, assign to (bundles of) ecosystem services"*, is emerging as a unifying term in this field of research (Scholte et al. 2015). Socio-cultural values are conceptually different from the standard monetary value interpretation of CES by acknowledging that people do not separate between non-material and material benefits when valuing cultural and environmental goods. This distinction is crucial for e.g. analysing the intangible local values in rural areas of Norway, where consuming and harvesting wild food, farming the land, or "contact with nature" and built heritage elements in the landscape, are fundamentally important for residents' well-being beyond the direct economic benefits (ASI 2010). It is also important to understand urban people's non-use values for e.g. maintaining cultural and natural landscapes in rural areas. The toolbox of non-monetary valuation methods is less well-developed or homogeneous, compared to the monetary methods (Kumar 2010), but recent research leads the way in the exploration and development of such methods also suitable for cultural heritage (see e.g. overview in Arias-Arévalo et al. 2018). These include quantitative methods (e.g. preference and psychometric surveys), mixed methods (e.g. Q and Delphi methods), qualitative methods (e.g. semi-structured interviews, focus groups, participation) and deliberative methods (e.g. citizen juries). Through the project we will explore, especially spatially explicit non-monetary methods, that can be combined with, supplement or replace monetary methods for certain services (Hirons et al 2016) or shed light on how urbanisation affects values (Radford 2013; Li and Wu 2013).

The use of values in CBA and spatial planning: Within CBA, costs and benefits to society of alternative scenarios for service flows compared to a baseline are reviewed, quantified in physical terms, and to the extent possible, valued in monetary terms. Diverse cost and benefit categories can then be compared. In many countries, including Norway, there is a formal requirement to conduct CBA of projects and polices with significant impacts (NOU 2012). However, current CBAs rarely include monetary values of non-market cultural and environmental goods at all. In addition, as noted, some CES are not easy to value in monetary terms or it may not be meaningful to do so (Daniel et al. 2012; Chan et al. 2012). Hence, there is also a need to better include the non-monetized values that convey welfare relevant information in CBA. The current methods used to assess and compare non-monetized ES within CBA are insufficient (Boardman et al. 2010; NOU 2012). Multiple value metrics have also been called for by decision-makers (Ruckelshaus et al. 2015). Integrating monetary and non-monetary values associated with ES into a hybrid CBA framework is both a

policy and management need, as well as a research challenge (Gomez-Baggethun and Lopez 2014)[2]. Critics further add that for CBA to play a more important role in the policy process, a more explicit focus on distributional issues and stakeholder involvement is needed to better understand who wins and who loses and resulting underlying conflicts (Nyborg 2012; Krutilla 2005).[3]. Finally, there is also a need to include cultural heritage goods within this framework (Tengberg et al. 2012) and to make CBA more spatially explicit to make it more directly useful for spatial planning (Brander et al. 2012). If the CBA framework can be amended in these ways, it can be very useful in structuring, reviewing and analysing costs and benefits of cultural and environmental goods, and as a basis to analyse trade-offs between different uses, over time, between geographical areas (especially the rural-urban gradient) and between key stakeholder groups (Bagstad et al. 2013). A growing number of cases suggest that incorporating the right monetary (and non-monetary) values of non-market goods into decisions is practical and can lead to a broader set of desired outcomes (Schaefer et al. 2015; Arkema et al. 2015; Lindhjem et. al forthcoming).

2.2 Approaches, hypotheses and choice of method

Objectives and research questions:

The project recognizes that urbanisation changes both the pressures on and uses of cultural and environmental goods and people's preferences (both use and non-use values) for such goods in Norway. The objective is to analyse how monetary and non-monetary values of selected cultural and environmental goods can be reliably estimated and integrated into an amended cost-benefit analysis framework and spatial planning, to find better solutions to trade-offs in decision-making and policy development affecting both rural and urban stakeholders.

Four secondary objectives have been identified, to:

1. Review implications of urbanisation in Norway for the pressures on, uses of and preferences for selected cultural and environmental goods.
2. Amend the standard CBA framework and spatial planning approaches to better include non-monetary values, equity and stakeholder concerns;
3. In two national valuation studies, with place-specific cases, that illustrate challenges with urbanisation:
    a. Demonstrate, test and compare improved and amended valuation methods.
    b. Investigate how different types of perceived landscape changes and other changes from urbanisation affect values held by rural and urban residents.
    c. Investigate value creation potential associated with the cultural and environmental goods.
4. Investigate how the value information can be used for analysis of trade-offs and synergies in decision-making and provide policy solutions.

We ask three overarching research questions: (1) What are the main implications of urbanisation for the values of cultural and environmental goods in Norway? (2) How can theoretically sound and practically relevant valuation methods be adapted and employed to selected cultural and environmental goods? (3) How can monetary and non-monetary valuation results be integrated, analysed and presented within CBA and spatial planning frameworks to better inform management of such goods?

Overall research methodology, work packages (WPs) and activities: We have structured the project to align with the formulated objectives and research questions (Figure 1). The project contains four work packages (WPs), where WP1 provides a review of the most important implications of urbanisation for non-monetary and monetary valuation of selected cultural and environmental goods in Norway (Activities 1.1-1.2, sec. objective 1). WP1 will be closely linked to WP2, which is more methodological in addressing the secondary objective 2 by developing an analytical framework of suitable SP, RP and BT and non-monetary methods for testing (Activity 2.1-2.3) in WP3. WP3 addresses through two national valuation studies, with local cases included (Activities 3.1-3.3) secondary objective 3 and provides valuation data to be utilised to achieve secondary objective 4. WP4 addresses the more practical challenges of presenting and utilizing the value information from WP3 in CBA and spatial planning (Activities 4.1-4.2) and provides lessons for integrated policy solutions and decision making (Activity 4.3). The interdisciplinarity of the project will be ensured through inclusion of leads and co-leads from different disciplines for each WP.

WP 1: Implications of urbanisation for valuation of cultural and environmental goods

[2] Cf. special issue devoted to "Integrated Valuation of Ecosystem Services" in the journal *Ecosystem Services* Dec. 2016

[3] Increased emphasis on equity issues has also been recommended in the guidelines on CBA in Norway (NOU 2012).

Lead: Wenche Dramstad (NIBIO), Co-lead: Herdis Hølleland (NIKU) & Henrik Lindhjem (MERE)

Aim of WP1: To review the most important physical changes to cultural/agricultural and natural land(scapes) and cultural heritage goods brought on by urbanisation the last few decades along a rural-urban gradient. This can be measured e.g. by use of selected indicators (e.g. Ulstein et al. 2017). Second, to investigate and hypothesize how these physical changes and other effects of urbanisation (e.g. a more urban lifestyle) affects user patterns and people's preferences for cultural and environmental goods. This work will form the basis for the choice of the most relevant decision-contexts and specific case examples in WP3, but also crucially inform the development and adaptation of non-monetary and monetary methods in WP2, and their integration.

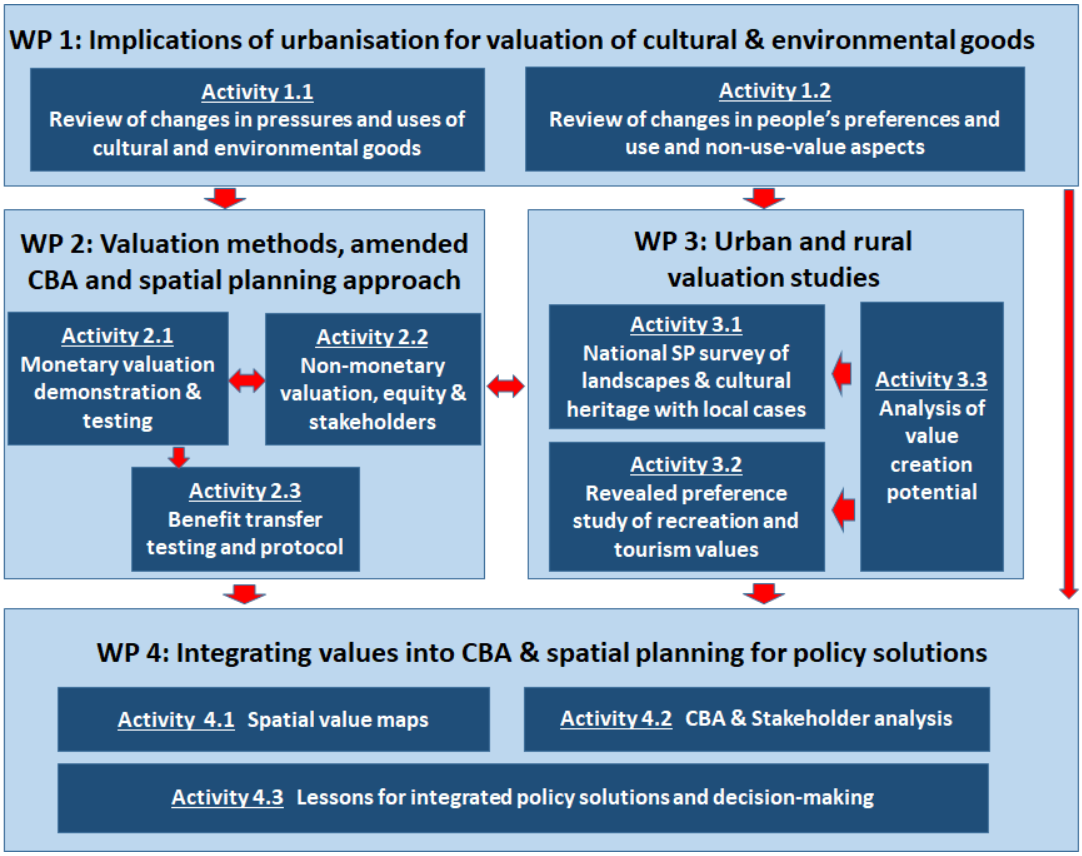

Figure 1: Project structure, work packages and activities

Activity 1.1: Review of changes in pressure and use of cultural and environmental goods: NIBIO has monitored the changes in land use and landscapes in Norway for many years. This activity will draw on their data from this monitoring program, in combination with SSB's statistics on urbanisation and population. Further, we will investigate changes over time and space in the abundance and quality of cultural heritage goods, incl. built heritage, from sources e.g. provided by the Directorate of Cultural Heritage. Secondary sources and data will be synthesized to provide the most useful input for valuation method refinement (WP2) and design of valuation studies illustrative of the most important challenges of urbanisation (WP3).

Activity 1.2: Review of changes in people's preferences and use and non-use value aspects: The literature is, to our knowledge, quite scarce on the impacts of urbanisation on people's preferences (and both monetary and non-monetary values) for cultural and environmental goods over time and space. It is for example not clear whether people who move to the cities become more or less interested in conserving nature or cultural heritage in rural areas. Some may recreate more (e.g. Sijtsma et al 2012). Those who stay behind in rural areas may also experience changes in their views of such goods. We will review interdisciplinary sources and SSBs statistics on (stated) living conditions and urbanisation, and synthesize the most interesting hypotheses for investigation in WP2/WP3.

Output: One peer-review paper for applied journal such as Landscape and Urban Planning, Land Use Policy.

WP 2: Valuation methods, amended cost-benefit analysis framework, and spatial planning approach

Lead: Ståle Navrud (NMBU), Co-lead: Kristine Grimsrud (SSB) & Sveinung K. Berg (NIKU)

Aim of WP2: First, refine/adjust both monetary and non-monetary valuation methods for CES and cultural heritage goods and develop specific experimental designs for demonstrating, testing and comparing methods

in the valuation studies in WP3. Second, to assess how to include non-monetary values, equity and stakeholder concerns in CBA.

Activity 2.1: Primary valuation testing and methods triangulation: We propose to use state-of-the art RP, SP and BT methods. As noted above there are specific challenges for valuation within all three major classes of valuation methods. For the SP testing, we aim to design an Internet-based SP survey[4] that will deal explicitly with hypothetical bias (e.g. through cheap talk or specific consequentiality designs) (Loomis 2011; Vossler 2015) and the problem that people tend to "forget" other public projects when focusing on only one (Hoehn and Randall 1989). We will also examine spatial variability and preference heterogeneity, especially along the rural-urban gradient. Further, we will carry out a TCM study of the recreational use values of selected case study sites. We will build on a resurgent, state of the art TCM literature, which addresses multi-site, multi-activity, multi-purpose trip challenges, utility-theoretic treatment of the value of time in estimation of travel costs and other advancements (e.g. Lew and Larson 2005). For a more complete valuation of the different types of recreational use values of rural areas, hedonic pricing will be used to estimate the spatially explicit value of cultural goods (Lazrak et al. 2014) and ES (Kling et al. 2015) as capitalized into recreational home prices. While, hedonic pricing will only capture values in the recreational home market, not all visits to rural areas are associated with recreational homes. A further limitation with using hedonic pricing is that it typically values of bundles of cultural goods and ES (Gibbons et al., 2014). Surveying recreational home owners specifically can therefore help shed light on the relative values of the cultural and environmental goods within such bundled goods. In addition, surveying other visitors to rural tourism destinations will help inform the expenditures related to all types of tourism (used for Activity 3.3 below).

Activity 2.2: Non-monetary valuation, equity and stakeholder involvement: A potential bias of monetary valuation is that people may be reluctant to express socio-cultural values in monetary terms as they perceive these values as critical services that cannot be expressed in that way. Another problem may be the intangible qualities of some CES and heritage goods (Milcu et al 2013). To alleviate some of these challenges, we will include non-monetary approaches and questions in our surveys and compare to monetary valuation, when possible and relevant (Martin-Lopez et al. 2012). We will consider utilizing both quantitative, qualitative and mixed methods. We will for example use focus groups for testing the surveys, that will also be utilized to investigate the plurality of values people hold and explore the limits for the meaningfulness of monetary valuation of CES and cultural heritage. The questionnaire surveys planned in WP3 will include questions of a non-monetary nature, e.g. why people move to places of cultural heritage, what it means for housing and recreational home choice, how often and how much time people spend at different sites, how important non-use aspects are etc. We will also consider including in the quantitative surveys use of landscape and cultural heritage preference rankings/ratings, without monetization (e.g. Dramstad et al. 2006) and subjective well-being questions, which may be compared to the regular surveys SSB has on living conditions in Norway. One way to combine non-monetary and monetary valuation is through the use of subjective well-being (or sometimes called "life satisfaction") data (see e.g. Fujiwara and Dolan 2016 and Graham 2016). Finally, we will consider using the Q method, which is a mixed method tool that can be combined with surveys, aimed for discourse analysis (e.g. Grimsrud et al. forthcoming; Bredin et al. 2015). Since there is a strong tradition in both (non-monetary) cultural heritage research and in environmental economics to use surveys, it is cost effective to put the primary focus on combined survey design. We will evaluate the potential use of non-monetary methods for welfare weighting of costs and benefits or other ways to include distributional, equity and specific local/rural concerns in CBA (Krutilla 2005) (see also WP4 below). We will compare the spatial distribution of monetary values with spatially explicit indicators of non-monetary values (Hirons et al. 2016). Finally, the activity will also critically assess the strengths and weaknesses of monetary and non-monetary methods separately and in combination.

Activity 2.3: Benefit transfer testing and protocol development: Often there is no time and/or resources for carrying out primary valuation studies for specific policy decisions. Therefore, BT methods are widely used in practice, despite often having relatively low precision (Lindhjem and Navrud 2008). We will examine how BT methods could be improved for cultural and environmental goods both in transfer across space (especially within and between rural and urban areas) and time, based on recent development in BT research (Johnston et al. 2015). Further, we will examine and discuss the level of precision required for different decision contexts. We propose to utilize both SP and RP data to investigate transferability and for some of our data even convergent validity of results between methods. We will also consider transferability of non-monetary values

[4] Internet based SP surveys have been shown to give reliable and useful value information (Lindhjem and Navrud 2011a, b).

based on survey data, a potentially novel research direction as such transfers are usually investigated only for monetary values.

Outputs: This WP aims for one peer-review paper from each activity. Relevant journals are e.g. Ecological Economics, Environmental and resource Economics, Ecology and Society, Journal of Cultural Heritage.

WP 3: Urban and rural *monetary and non-monetary* valuation studies

Lead: Kristine Grimsrud (SSB), Co-leads: Henrik Lindhjem (MERE) & Sveinung K. Berg (NIKU)

Aim of WP3: To demonstrate, test and compare improved and amended valuation methods. Second, we aim to investigate how different landscape and other changes from urbanisation affect residents' and visitors' preferences and use and non-use values along the urban-rural gradient. Non-monetary valuation methods will be combined with monetary methods in the surveys and other data collection proposed. Finally, value creation status and potential will be analysed for a selection of local cases (to be determined).

Activity 3.1: National stated preference survey of landscapes and cultural heritage with local cases: We will carry out a national, representative stated preference study to elicit people's willingness to pay for measures and plans to protect or enhance a selection of cultural and environmental goods. The main emphasis will be on cultural heritage (including built heritage) and cultural and natural landscapes that provide aesthetical, recreational and tourism services, a range of more intangible services (e.g. linked with identity or spiritual significance), and non-use values. We will choose 6-8 specific locations along the urban-rural gradient where valuation scenarios will be designed with textual and visual information in the survey based on specific plans for enhancing (or avoiding degradation of) the goods in question. We will use a high quality, nation-wide internet panel maintained by e.g. TNS Gallup and oversample respondents in and around the case study areas. Subsamples will be given different cases to consider in order to elicit their preferences, using both willingness to pay and non-monetary measures (as discussed in WP2 above). We aim to investigate whether or not it is possible and meaningful for respondents to distinguish between cultural and environmental elements, e.g. in a landscape, of the goods they value. We will also investigate how people's preferences, and corresponding use and non-use values, vary with the quality and quantity of the good (e.g. the type of cultural heritage and status of protection), spatially (rural-urban), with distance to the good in question, and along socio-economic characteristics. We will also try to analyse which types of perceived changes in the landscape and cultural heritage elements from urbanisation matter the most for people in rural and urban areas. Since the Internet panel contains much information about respondents (incl. where they were born and grew up) we will also consider investigating and comparing preferences of people that have moved to the cities with people who remained in rural areas. Finally, we will test BT approaches between the cases to investigate whether or not both non-monetary and monetary values can be transferred geographically and between goods of slightly different types. When choosing the specific case study areas and plans for valuation scenarios, we will consult the users in both cultural heritage and environmental/agricultural sectors that have been recruited for the project. Recent methodology and survey development projects on cultural heritage by members of the research team for some of the involved users (see e.g. Gierløff et al. 2017, Magnussen et al. 2017a,b) can be utilised to make the valuation survey the most realistic and useful, while at the same time providing high quality valuation data for publication. We aim to choose sites that are both iconic/ high profile and more ordinary, e.g. "everyday" landscapes and cultural heritage sites that are less spectacular, but that typically are the source of the highest total welfare effect when considering the much larger number of people experiencing such goods in their everyday life.

Activity 3.2: Revealed preference study of recreation and tourism use values: We will use the hedonic valuation and travel cost methods to investigate the changing use values of rural recreation areas in the context of urbanisation. Of particular interest are both the natural and cultural characteristics of the areas where recreational homes/cabins are located on their prices and recreation values, and the impact of place attachment (Lewicka 2011), identity and heritage on recreational home ownership and use patterns. We will take advantage of a unique opportunity we have at SSB to combine data sets to perform this analysis. The data from the Norwegian building registry will be used to identify the geographical location and characteristics of recreational homes. These spatially explicit data will be overlaid with GIS layers on cultural heritage and cultural environments that are either protected or considered worth protecting. We will also add GIS layers from the Environmental Agency with information on protected cultural landscapes and other areas (e.g. reserves), in addition to other qualities that matter for prices (e.g. travel distances, proximity to downhill and cross-country skiing etc). Characteristics of owners of the recreational homes may be found by combining the data from the Norwegian building registry with demographic microdata available at SSB. In addition to the usual socioeconomic variables, it is of particular interest to incorporate data on urbanisation. These data will

in turn be combined with price data for recreational homes (from 2005 and onwards). Once this data set is constructed, we will be in the position to investigate, using spatial econometric analysis, how urbanisation processes have affected the use value for cultural environmental goods in the proximity of recreational homes. In addition, we will construct natural experiments to analyse how policy and infrastructure changes may affect future demand for recreational homes. One example of a new policy that has changed the demand for recreational homes is that municipalities now can decide whether they would like to remove the obligation to reside on the property for a time ('boplikt'). Finally, a TCM survey will complement this hedonic valuation analysis since the sales prices data analysis may be affected by sample selection bias. This is because it is not unusual that recreational homes stay in a single family for several generations. We hypothesize that these values change spatially on a gradient from urban to rural as well as over time in urbanised populations. The TCM survey will by design also collect data on non-monetary indicators of the value, e.g. the frequency of visits to certain areas, time use for travel and on-site, preferences for certain cites over others, and potentially also how monetary and non-monetary use values would change given hypothetical scenarios changes of the quality of certain sites (so-called contingent behaviour approach).

Activity 3.3: Analysis of value creation potential: The cultural and environmental qualities of an area may generate substantial income to local communities (see e.g. the analysis of Rjukan by Bowitz and Ibenholt 2009). We will use a stepwise method to estimate the value creation associated with cultural landscapes, cultural heritage and natural qualities in 2-3 of the local case study areas from Activities 3.1 and 3.2, to supplement the use and non-use values estimated there. The first step will be to estimate the number of tourists visiting an area of interest. We will use teledata from Telenor, in combination with data on overnight stays from SSB's annual tourism survey, and interviews with local tourism representatives. We will also use the surveys in Activities 3.1-3.2 to supplement information on tourism expenditures and to identify the link between the cultural and environmental goods and tourists' motivation for visiting the area. In the second step, we will use the data sources to estimate different types of tourist expenditures in the local economy. In the third step, we use accounting data from Menon's own accounting database of all Norwegian businesses, to estimate how much the total income equals in terms of value creation and employment. The potential change in value creation will be sought predicted using various assumptions on the change of the quality/quantity of environmental and cultural goods (from Act. 3.1-3.2).

Outputs: The research in this WP will be highly empirical and based on the more methodological work in WP2. We aim for at least one peer-reviewed paper from each activity, targeting journals such as Environmental and Resource Economics, Journal of Cultural Heritage, Landscape and Urban Planning.

WP 4: Integrating values into CBA and spatial planning to inform policy solutions

Lead: Henrik Lindhjem (MERE), Co-lead: Kristin Magnussen (MERE) & Sveinung K. Berg (NIKU)

Aim: The final WP aims to utilise the estimated monetary and non-monetary value information from WP3 in CBA and spatial planning to inform policy solutions re. management of cultural and environmental goods.

Activity 4.1: GIS-spatial representation of value maps: Aims to utilize the valuation data from WP3 to create spatially explicit value maps for a selection of the place-based cases in WP3, i.e. the distribution of costs and benefits, in monetary and non-monetary terms, and winners and losers, for different decision-relevant scenarios, described on GIS map(s) of the affected rural and urban population. We will analyse and discuss levels of precision and uncertainty and compatibility of combining different types of CES and cultural heritage goods into a spatial context.

Activity 4.2: Cost-benefit, stakeholder analysis and *inclusion of non-monetary values*: We will use the value maps from Activity 4.1 in an extended CBA of alternative policy scenarios for a selection of measures/plans to enhance or avoid degradation of cultural and environmental goods from WP3. Further, we will use stakeholder analysis, with inputs from our user panel, to supplement standard CBA in two ways: (1) Consult users who has specific local and sector knowledge to ground-proof the value maps and the results of the equity analysis from the CBA. (2) Involve decision-makers to comment upon the usefulness of spatially explicit costs and benefits for spatial planning. This activity will also consider further methods to integrate and better represent and include non-monetary values in CBA from a methodological (e.g. Fujiwara and Dolan 2016) and more practical perspective. Magnussen et al. (2016) and Lindhjem et al. (forthcoming) have proposed a method for assessing ecosystem service impacts, where some impacts are valued in monetary terms and some are considered from a welfare perspective, but kept on a non-monetary form. This method can be further improved, e.g. to consider aspects from multicriteria analysis. Their assessment method is a way to improve on the often-used method in Norway derived from environmental impact assessments, where

importance (consequence) of the impacts are considered by experts, rather than based on people's preferences and welfare, using a ++++/---- scale format.

Activity 4.3: Lessons for integrated policy solutions and decision-making: This activity will go more in-depth on the effectiveness of using the estimated values in amended CBA and spatial planning, and in turn the usefulness of this approach for finding policy solutions that make the right trade-offs between costs, benefits and value creation, and include non-monetary values, for the management of such goods. The results from WP3 and WP4 should also be useful to inform future conditions for expanding commercial activities to create income locally, but also in urban and peri-urban areas, based on cultural and natural heritage, without compromising the resource base. The activity will, in close dialogue with the user group, discuss the need for some sort of guideline or simple handbook on how to better assess the values of cultural and environmental goods. This would supplement, and probably make more specific for cultural and environmental goods, recommendations and guidelines for example on CBA provided by the Ministry of Finance and The Norwegian Government Agency for Financial Management (DFØ).

Outputs: This WP is more policy- and user-oriented. We aim for one short report that summarises and popularizes the research results and policy-relevance of the project. Further, we aim for at least two peer-review papers for policy-oriented journals, e.g. Land Use Policy, Environmental Science and Policy.

3. The project plan, project management, organisation and cooperation

The consortium consists of a core interdisciplinary research team based in Norway, supported by an interdisciplinary expert group with strong international participation from Europe and North-America.

Core Team: The research department at **Statistics Norway (SSB)** will lead and administer the project. The research department has strong economics and valuation competence. We will utilise extensive data collected and maintained by SSB on e.g. population, urbanisation and land use trends, prices of recreational homes, land uses, ongoing surveys of living conditions in Norway, and competencies from other departments (such as GIS and mapping, survey methodology). Senior researcher **Kristine Grimsrud (PhD)** will lead the project, supported by **Dr. Stefan Leknes**, an expert on regional and urban economics and population projections. Grimsrud has more than 20 years' experience from Norway and the USA on statistics and non-market valuation methods, recently focused on land use, landscapes and CES. **Norwegian University of Life Sciences (NMBU)** is represented by **Prof. Ståle Navrud**, who is a world-renowned environmental economist and Norway's top, most prolific scholar in valuation, with more than 5000 Google Scholar (GS) citations. **Norwegian Institute for Bioeconomy Research (NIBIO)** strengthens the team with Head of the Landscape Monitoring department, senior research scientist **Wenche Dramstad (PhD)**, and senior researcher and ass. prof. **Anders Bryn**, Dept. of Land Resource Surveys. Dramstad has worked on landscape analysis, landscape architecture, non-monetary values and land-use planning for nearly 30 years (GS citations~2000). Bryn has a PhD in geography and has worked extensively on the impacts on human activities on landscape ecology and biodiversity, natural resource mapping and management, cultural history and nature-based tourism. **Norwegian Institute for Cultural Heritage Research (NIKU)**, represented by the Director of the Department of Cultural Heritage and Society, researcher **Sveinung Berg** and **Herdis Hølleland (PhD). Berg,** a human geographer, has worked extensively on cultural heritage research in and around urban areas, especially its potential for providing both cultural and economic (market) values. Hølleland has an interdisciplinary background in archaeology and heritage studies. Her recent research includes heritage tourism and heritage valuation, including CES. **Menon Center for Environmental and Resource Economics (MERE)** is represented by senior researchers **Kristin Magnussen (PhD)** and **Henrik Lindhjem (PhD).** MERE is the leading applied research and policy analysis center in Norway specialised in valuation of cultural and environmental goods, the development of CBA methods and in policy evaluation and development. Magnussen and Lindhjem are specialised in these areas (>1500 GS Citations). MERE is well-placed to contribute to policy relevance and make sure results are communicated to users. The project proposes funding of one pre-recruited PhD scholar (Endre Kildal Iversen), who has already been recruited, that will be associated with NMBU and funded 30 percent with own funding from MERE.

Interdisciplinary expert group with international participation: The team also consists of six distinguished researchers (five international). They will provide key inputs to the methodological design, interpretation of valuation results and contribute to joint papers. Each have specific skills which will be utilized in WP2 and WP3, but also in the more practical work in WP4. **Prof. Susana Mourato,** head of Dept. of Geography and Environment, at the London School of Economics and Political Science has worked for 25 years in the area of valuation, culture and well-being (GS citations > 8000). She will lead the expert group. From Canada, Prof. **Vic Adamowicz** of the Dept. of Resource Economics and Environmental Sociology at the University of Alberta will bring strong competence of SP methods (>15000 GS citations). From Germany, **Nele Lienhoop**,

Head of working group on Nature Conservation and Biodiversity at the Heimholtz Centre for Environmental Research, will participate. She is experienced in using more qualitative valuation methods. From Spain, senior researcher and ecological economist **Marina Garcia-Llorente**, from Madrid Institute for Rural, Agricultural and Food Research, will provide advice on sustainability of social-ecological systems based on agroecological principles and the use of non-monetary methods (GS citations > 2000). From, NTNU, Dep. of architecture, history and technology, **Professor Dag Kittang**, will participate to strengthen the competence on architecture and cultural heritage in the context of sustainable urbanisation. Finally, **Dr. Gabriella Hofer**, from the Swiss institute Agroscope will add competence on cultural/rural landscapes and landscape ecology.

4. Key perspectives and compliance with strategic documents

Compliance with strategic documents: This project complies with the main strategy of the research dep. of SSB: to strengthen both the quality and relevance of its research, and to utilise the extensive sources of data it collects and maintains e.g. on population and urbanisation trends, tourism etc, and its competencies.

Relevance and benefit to society: This project has a strong emphasis of conducting high quality research that is also of high relevance and benefit to society. Developing better methods and tools for valuing cultural and environmental goods and utilizing this information for more integrated and holistic decision-making is a core challenge for policy decisions in Norway as well as internationally. This has been underscored by the great interest from users in participating actively in this project (see below).

Environmental impact, ethical and gender issues: This project is expected to improve management of cultural and environmental goods. It will follow the ethical guidelines developed by the national committee for research ethics in the social sciences and humanities. **The project manager and 50% of the core and expert teams are women**. No other gender issues arise.

5. Dissemination and communication of results

Dissemination and communication plan: Detailed plan provided in the electronic template.

Communication and involvement of users: The project will be implemented in close cooperation with the government users: Directorate for Cultural Heritage, the Culture Heritage Fund, Design and Architecture Norway (DOGA) and the Environment Agency, with active involvement also from WWF, Norwegian Recreational Home Owner Association and Norwegian Agriculture Association (see plan).

New references in revised version [original references deleted here, see original version of project description]:

Arias-Arevalo, P., Gómez-Baggethun, E., Martín-López, B., Pérez-Rincón, M. Widening the evaluative space for ecosystem services: A taxonomy of plural values and valuation methods. Environmental Values 27: 29-53. **Bredin, Y**., H. Lindhjem, J. V. Dijk and J. Linnell (2015) Mapping value plurality towards ecosystem services in the case of Norwegian wildlife management: A Q analysis. Ecological Economics 118: 198-206. **Fujiwara**, D. and P. Doland (2016) Happiness-based policy analysis. In Adler, M. D. and M. Felubaey (eds) The Oxford handbook of well-being and public policy. Oxford University Press. **Gierløff, C**.; Magnussen, K.; Eide, L.S.; Iversen, E.K.; Ibenholt, K.; Dombu, S.V; Navrud, S.; Strand, J: (2017) Verdien av kulturarv - En samfunnsøkonomisk analyse med utgangspunkt i kulturminner og kulturmiljøer. Menon-Publikasjon Nr. 72/2017. Graham, C. (2016) Subjective well-being in economics. In In Adler, M. D. and M. Felubaey (eds) The Oxford handbook of well-being and public policy. Oxford University Press. **Grimsrud**, K. M. Graesse and H. Lindhjem (forthcoming) Mapping value plurality towards ecosystem services in the case of planted spruce climate-forests: A Q analysis. Working paper. **Lindhjem**, H. et al. (forthcoming): Tiltak i strømnettet og påvirkning på økosystemtjenester i samfunnsøkonomiske analyser. Rapport for Statnett. **Magnussen**, K; Gierløff, C.W.; Dombu, S.V.; Navrud, S: (2017a) Kulturmiljøenes samfunnsnytte: Utkast til spørreskjema til innbyggerundersøkelse til Riksantikvarens miljøovervåkningsprogram. Menon-Publikasjons Nr. 81/2017. **Magnussen**, K.; Gierløff, C. W.; Dombu, S.V.; Navrud, S. (2017b): Kulturmiljøenes samfunnsnytte: Ikke-bruksundersøkelse til Riksantikvarens miljøovervåkningsprogram. Menon-Publikasjon Nr. 82/2017. **Magnussen**, K., S. Navrud and A.M. Erlandsen (2016) Revisjon av konsesjonsvilkår for vannkraft - Verdsetting av effekter på økosystemtjenester. Vista-rapport 58/2016. **Ulstein, H.**; Magnussen, K.; Iversen, E. K.; Dombu, S.V.; «Hvordan måle samfunnsnytten av kulturmiljøer over tid? Forslag til indikatorer for miljøovervåking Menon-Publikasjon Nr. 80/2017.