

Cultural Heritage Reuse for Sustainable Development – Opportunities and Challenges

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Abstract

Ambitious policies are calling for capitalizing on the opportunities of using underutilized material cultural heritage for sustainable development. In this article, we argue that such strategies must be followed up by instruments that rise to the challenge. From the recognition that reusing material cultural heritage may not solely translate into positive impacts, we present the results of a literature review aimed at establishing a knowledge base to facilitate the achievement of contemporary (inter)national policy goals.

Findings reveal a gap between ambitious policy goals and the insufficiency of means to reach those goals. Our review shows that existing guidance is fragmented, diffuse and not comprehensive enough to cover the whole reuse process – from design to evaluation. While there are various frameworks to support selection of cultural heritage reuses, not all of them facilitate wide stakeholder consultation. Sustainability indicators and multicriteria analysis methods emerge as crucial (yet challenging) elements to support the consideration and integration of sustainability criteria and multiple interests and perspectives.

The results reveal knowledge gaps and practical hurdles that can hinder putting policy goals into practice, but also identify needs and opportunities to be followed up in subsequent research. Looking forward, it will be key to reflect on what kind of instruments are required to reuse material cultural heritage in ways that contribute to sustainable development, as well as how these instruments are to be developed. Together, the ‘what’ and the ‘how’ will affect their capacity to integrate multiple perspectives, balance interests and, ultimately, how sustainability is operationalized.

Keywords

Material cultural heritage, sustainable development, reuse, literature review, Norway

Introduction

Over the last decades, there have been three major trends in cultural heritage (CH) management. First, the scope of what should be protected has been widened (UNESCO, 1992, 1994, 2003). Second, there has been a shift in how CH is to be protected, through which the (re)use of CH has increasingly been understood as a conservationist strategy (Plevoets & van Cleempoel, 2019). Third, the role of CH in sustainable development (SD) has been extended: from being a pillar of SD (e.g., UN, 2002) to also being a resource to be actively used for SD (e.g., CoE, 2005, 2014, 2017; EC, 2014; ICOMOS, 2011; Labadi et al., 2021, Potts, 2021; UNESCO, 2013, 2015).

In line with these international trends and shifts, CH policies in Norway have progressively broadened their scope from being initially focused on safeguarding cultural sites of a certain age and historic value to protecting a wider range of sites, environments, and landscapes by making active use of them (MD, 2013; MD, 2005). These shifts are reflected in Norway's current policy goals, according to which a diversity of cultural environments should be preserved as a basis for knowledge, experience, and use; everyone should have the opportunity to get involved and take responsibility for the cultural environment; and the cultural environment shall contribute to sustainable development through holistic planning (KMD, 2020, p. 7).

The latter goal is particularly timely considering contemporary unsustainable trends including global warming (IPCC, 2023) and environmental changes driving the deterioration of biodiversity and ecosystem functions and services (UNEP, 2022). With land use changes and the construction sector being substantial contributors to these trends, reusing existing underutilized material cultural heritage (MCH) seems pertinent, particularly when MCH is at risk of being lost (Dammann, 2020).

While it is challenging to question the timely relevance of this policy goal, research suggests that the relationship between MCH and SD remains theoretical in nature, and that more empirical research investigating the implications of reusing MCH for SD is needed (e.g., Bullen & Love, 2010, 2011; Calder, 2015). Reusing MCH does not always translate into a positive contribution, as reuse can create both positive and negative impacts (e.g., Camerin et al., 2021; Durukan et al., 2021; Europa Nostra, 2015; Lillevold & Harstad, 2019). Whether MCH reuse contributes to SD ultimately depends on how reuse processes are designed and implemented (de Medici et al., 2020).

Thus, acknowledging how challenging reaching this ambitious goal can be, there is a need to investigate how to support it. In our study, we sought to address this need by turning to relevant literature to query which measures (e.g., methods, guidelines, frameworks) exist to effectively strive for this goal. The aim of this paper is, thus, to

present relevant knowledge to facilitate achievement of contemporary (inter)national policy goals focused on capitalizing on the potential of using MCH in ways that support SD.

Background and justification

Reusing MCH – often termed as ‘adaptive reuse’ – emerged in the 1960s and 1970s as a conservationist strategy (Plevoets & Cleempoel, 2019). Building on existing definitions, ‘adaptive reuse’ reflects the aspiration to balance the adaptation of obsolete or underutilized MCH to new conditions and needs in order to extend its life cycle while preserving its values (Aigwi et al., 2020; Dane, Houpert & Derakhshan, 2019; De Medici et al., 2020). However, as different people may attach different values to MCH, reaching consensus on what to protect and what to change is not straightforward. Moreover, there may also be discrepancies on what are the societal conditions and whose needs MCH is to adapt to and, thus, which types of use functions (and changes) are relevant to consider.

Contemporary policy goals go a step further and call for reusing MCH in ways that contribute to SD. This does not necessarily imply a fundamental shift, as MCH values and societal needs (e.g., food, health, drinking water, decent work, education, access to nature, etc.) are integrated in internationally agreed sustainable development goals (SDGs). However, it does add a layer of complexity considering that the conceptual ambiguity (Saarinen, 2014) and fuzziness of SD (Briassoulis, 2001) can translate into different operationalisations. This is crucial because misconceptions and/or deficient operationalisations of sustainability can lead to a narrow understanding of the impacts of reusing MCH with an exaggerated focus on economic and material components to the detriment of environmental, social, and intangible aspects (Europa Nostra, 2015; Guzmán et al., 2017; Nocca, 2017).

A further challenge of incorporating SD into MCH reuse strategies is that when working with SD, being a multidimensional concept, conflicts and tensions can emerge, making trade-offs and compromises necessary. It can be challenging to unite interests in retaining the historic values of MCH with regeneration and renovation strategies targeting modern functionality and addressing contemporary requirements (Blagojevic & Tufegdzic, 2016; Pendlebury, 2002). Tensions may, for instance, emerge between preservation and energy efficiency goals (Loli & Bertolin, 2018; Yung & Chan, 2012) but also between economic viability and heritage requirements related to the use of specific materials and/or skilled personnel (Bullen & Love, 2011). Building requirements to safeguard e.g., fire prevention, evacuation and/or universal design, planning demands and cost efficiency can also make it difficult to find a specific use for MCH and, thereby, hinder the reuse of MCH (Bullen & Love, 2011; Oslo Economics, 2017; Yung & Chan, 2012).

Moreover, in addition to the difficulties of dealing with trade-offs across sustainability dimensions and criteria, dilemmas may also emerge between what one consid-

ers to be present and future needs and what one deems sustainable for present and future generations. Which MCH values need to be sacrificed to satisfy present needs at the expense of future generations? Yet, considering the costs and challenges of preserving obsolete MCH, what might the alternative be?

In the wake of policies calling for the preservation of MCH through its use, and of pressures to make more efficient use of land and material resources, the reuse of MCH is gaining in popularity. Yet, it follows from the above that reusing MCH in ways that contribute to SD is challenging in so far as it demands clarification of what SD means in addition to navigation through various dilemmas in the decision-making process of how to reuse MCH.

In Norway, municipalities bear the main responsibilities and authority in the management of MCH and rely on legal (the Planning and Building Act), planning and financial instruments to do so (KMD, 2020). However, research on the work initiated by municipalities and county municipalities to integrate the UN's sustainability goals in their planning reveals substantial challenges in terms of lack of time, resources, methods, knowledge, tools, and guidance material, as well as suggests that cultural heritage is not well covered in the sustainability goal structure (Lundberg et al., 2020). Moreover, a substantial number of MCH resources are privately owned, and with responsibilities for MCH management being spread across a wider range of formal public bodies (e.g. county municipalities, Directorate for Cultural Heritage) and civil organizations (KMD, 2020), it may not be easy to guide and manage MCH reuse processes towards sustainable development goals.

These complexities substantiate the need for conducting a literature review to determine which is the state of the art: which measures (e.g., methods, guidelines, frameworks) exist to support the design, implementation and evaluation of MCH reuse cases so that they are better placed to contribute to SD? With this, we seek to create a knowledge base to enhance the contribution of MCH to sustainable development.

Method – literature search process

The literature review was conducted between June and December in 2021. It comprised i) two searches in Scopus comprising the keywords ‘cultural heritage’ and (‘reuse’ or ‘re-use’ or ‘transformation’) and (‘sustainability’ or ‘sustainable development’); ii) one screening of websites from key institutions (e.g., the Directorate for Cultural Heritage, European Commission, UNESCO, ICOMOS); and consultation with stakeholders from the public administration and civil society with experience in the CH sector.

Keywords were selected based on the topic at hand: how to enhance the contribution of material cultural heritage to sustainable development through the reuse of cultural heritage. To make sure we did not miss relevant sources, we also included keywords that are used interchangeably to refer sustainable development and reuse. When it comes to the search channels, Scopus is the largest database of peer-reviewed

literature, but as not all relevant knowledge is published in academic channels, we regarded it as necessary to consider grey literature published by institutional actors. The search was not limited to particular disciplines. Institutions were selected on the basis of the first-hand knowledge gathered by previous professional experience in the MCH sector.

Searches were only supplemented with a partial screening of references contained in the studies retrieved due to resource limitations. In total, over 350 items were retrieved, and after reading abstracts and documents, 84 documents were ultimately included in the review. The process of the literature review was documented in an Excel file and is summarized in figure 1.

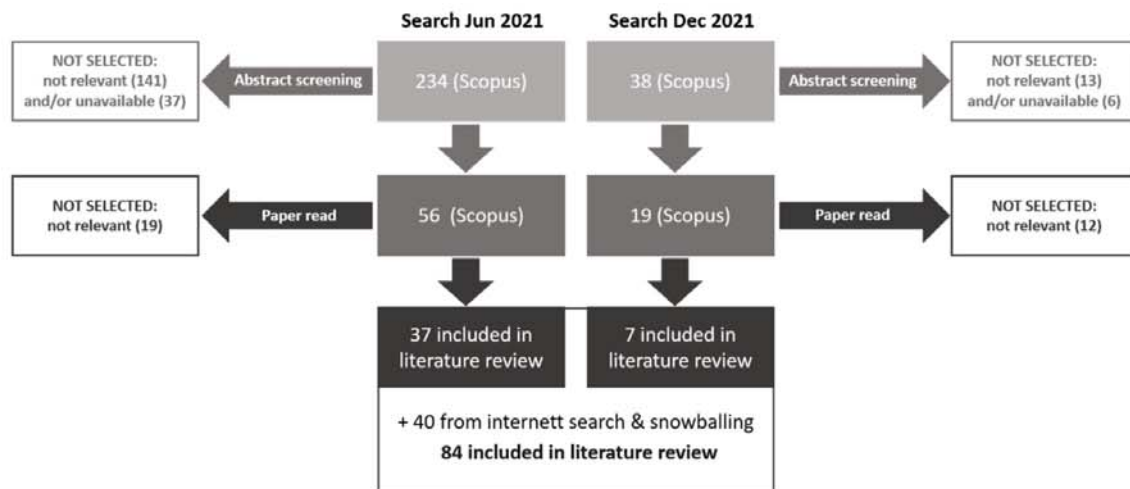


Figure 1. Literature search process

As illustrated in figure 1, several resources were excluded after reading of abstracts and papers. The excluded resources comprised papers focused on themes such as natural heritage; intangible heritage, festivals, and events; policy analysis in non-Nordic regions; tourism as a tool for sustainable development; and computational/digital science. We also excluded documents that referred to the relationship between cultural heritage and sustainability in too general terms, without substantiating how this contribution may take place (e.g., the mere statement that cultural heritage contributes to sustainable urban development). Last, although our search was not limited to a particular period of time, we delimited the review of resources retrieved by our search to those published after 2015, because in this year a comprehensive review was conducted by the project ‘Cultural Heritage Counts for Europe’ (Europa Nostra, 2015), the results of which are included in our review.

The literature review retrieved various types of resources, including studies focusing on documenting impacts of MCH reuse. The results section, however, focuses on summarizing findings relevant to the aim of this paper, which ultimately is to provide a knowledge base to facilitate that MCH reuse processes take place in ways that support the implementation of ambitious policy goals.

Results

Frameworks

The literature review retrieved various frameworks (n=30) developed with different purposes, albeit all relating to the field of MCH reuse. As illustrated in figure 2, at an aggregate level, we identify two main types of frameworks: a) those proposed to be used at an early phase in the decision-making process to guide MCH reuse; and b) those designed to conduct ex-post evaluations. Some of the ex-post evaluation frameworks may, in principle, be also applicable at early phases and v.v.¹

Frameworks to be used at early phases

- assess and prioritize reuse alternatives (Aigwi et al., 2019, 2020; Capolongo et al., 2019; Chen et al., 2018; De Gregorio et al., 2020; Dell'Ovo et al., 2021; Della Spina, 2020; Della Spina et al., 2020; Haroun et al., 2019; Oorschot et al., 2018; Rossitti et al., 2021; Sladowski et al., 2021; Torrieri et al., 2019; Vehbi et al., 2019)
- identify reuse opportunities (Foster & Saleh, 2021; Oppio & Dell'Ovo et al., 2021; Richiedei, 2020);
- optimize investment choices (Della Spina, 2021)
- prevent the selection of inappropriate functions (Besana et al., 2018)
- facilitate early environmental assessments at early stages (Magrini & Franco, 2016)
- encourage the adoption of circular economy perspectives in reuse projects (Bosone & Ciampa, 2021*; Foster, 2020; Foster et al., 2020*)
- identify most energy efficient measures (Stajonevic et al., 2021); and assess cases' vulnerability to flood risks (Gandini et al., 2018)

Ex-post evaluation frameworks

- evaluate the contribution of MCH reuse projects to aspects relevant for sustainability (Bosone et al., 2021; De Medici et al., 2020*; Gravagnuolo et al., 2021; Mohaddes Khorassani et al., 2019; Olmedo & Barrientos, 2020; UNESCO, 2019)

Figure 2. Overview of frameworks retrieved by the literature review.

To the first type of frameworks (a) belong frameworks developed to evaluate, rank, and choose from among alternatives using different types of criteria. Alternatives can comprise functions with which to fill-in particular heritage objects (e.g., Chen et al., 2018; Dell'Ovo et al., 2021; Della Spina, 2021; Della Spina et al. 2020; Haroun et al., 2019; Torrieri et al, 2019); cultural heritage buildings to satisfy particular functions (e.g., Aigwi et al., 2019, 2020) or a combination of both, i.e., which functions to allocate in which buildings (Capolongo et al., 2019; Della Spina, 2020). The second type of frameworks (b) typically consists of sets of indicators to evaluate the contribution of MCH reuse projects to selected criteria (e.g., Bosone et al., 2021; de Medici et al., 2020; Mohaddes Khorassani et al., 2019), which we comment on further below.

Methodologies to develop frameworks are diverse and comprise literature review and desk research, workshops, focus groups, surveys, observations, fieldwork, and statistical and spatial analysis. However, most frameworks depart from a literature

1. Examples of such frameworks are marked with * in figure 2.

review and desk research, and a substantial number of them are only based on existing literature (e.g. Besana et al., 2018; de Gregorio et al., 2020; Foster, 2020; Foster et al., 2020; Gandini et al., 2018; Haroun et al., 2019; Magrini & Franco, 2016; Mohaddes Khorassani et al., 2019; Rossitti et al., 2021), the results of which are eventually adapted to the specific case (e.g., Aigwi et al., 2019, 2020). Some frameworks are more fundamentally grounded on specific cases (Oppio & Dell’Ovo, 2021; Richiedei, 2020; Vehbi et al., 2021) and/or draw on the consultation of stakeholders. Yet, these consultations are often limited to experts and/or technicians (e.g., Bosone et al., 2021; Capolongo et al., 2019; Dell’Ovo et al., 2021; Oppio & Dell’Ovo, 2021; Sladowski et al., 2021; Stajonevic et al., 2021; Torrieri et al., 2019), and only few frameworks draw on consultation with a wider range of stakeholders for defining needs (e.g., Bosone & Ciampa, 2021), alternatives (e.g., Della Spina, 2020, 2021; Vehbi et al., 2021) or criteria (Della Spina et al., 2020).

We note, however, that more attention is devoted to the engagement of the diversity of stakeholders in the application of frameworks: 23 out of the 30 frameworks found are applied in real-life cases. In doing so, a wide range of actors – including institutional representatives, public administrations, experts, technical-professional organizations, entrepreneurs and business owners, heritage owners, developers, users of heritage buildings, local communities and/or civil organizations – are engaged in weighting criteria and/or evaluating reuse alternatives (Aigwi et al., 2019, 2020); selecting alternatives (Della Spina et al., 2020); identifying and mapping needs and impacts (Bosone and Ciampa, 2021); and assessing projects (De Medici et al., 2020) and/or their impacts (Mohaddes Khorassani et al., 2019; Torrieri et al., 2019). Still, we note that the applications of various frameworks are also limited to experts (Chen et al., 2018; Dell’Ovo et al., 2021; Della Spina, 2020; Gandini et al., 2018; Olmedo & Barrientos, 2020; Oppio & Dell’Ovo, 2021; Sladowski et al., 2021).

Experiences from case-specific applications of frameworks designed for early phases of the decision-making process show that they are useful to understand the implications of interventions and evaluate alternatives to prioritize choices.

Beyond supporting monitoring and benchmarking exercises (Foster & Saleh, 2021), the application of ‘ex-post’ assessment frameworks can also increase awareness about the implications of reusing MCH for SD, eventually attracting investments (Gravagnuolo et al., 2021). Moreover, the application of monitoring frameworks provides learning opportunities, as illustrated by De Medici et al. (2020), who show that even similar MCH reuse projects can have differentiated impacts, depending on how selected functions and their management interact with their local context.

Although frameworks’ utility to assist decision-making processes was demonstrated in studies that only engaged experts (e.g., Chen et al., 2018), their potential seems to unfold when a wider range of stakeholders is engaged in defining use alternatives and/or criteria, weighting criteria and/or evaluating alternatives. Under wider stakeholder engagement, frameworks can be better positioned to support the prioritization of reuse alternatives under consideration of multiple criteria *while* balancing

various stakeholders' interests (e.g. Aigwi et al., 2019; 2020; Vehbi et al., 2021); provide a more complete understanding of what the alternatives imply (Dell'Ovo et al., 2021); and facilitate the generation of credible, transparent and shared choices that are more likely to be accepted (e.g., Della Spina, 2020; Vehbi et al., 2021).

In addition to the 'operational' frameworks presented in figure 2, Li et al. (2021) identify six research frameworks for understanding adaptive reuse in the context of SD:

1. Campbell's planner's triangle, which seeks to balance social justice, economic development and environmental protection and interrelated property, development and resource conflicts between these three dimensions;
2. Townsend's planner's circle, which focuses on the interrelations between five indicators (nature, place, economy, community and psychology) and their related sub-indicators to assess the heritage reuse process;
3. The model of social sustainability forwarded by Vallance, which highlights the human dimension;
4. UNESCO's 'Historic Urban Landscape' (HUL) approach which is based on the concept of 'dynamic integrity' referring to the need to manage heritage in evolving environments;
5. The diagram proposed by the EU funded project 'Cultural Heritage Counts for Europe' (CHCfE) (Europa Nostra, 2015) comprising four value domains: cultural, social, environmental and economic; and
6. Srinivas' matrix for heritage conservation management based on two axes: one considering conservation and development from a heritage and macro perspective and one considering direct and indirect benefits generated at the community and the city level.

These frameworks are certainly relevant in so far as they bring attention to aspects, values, relationships, and conflicts that should be considered in MCH reuse processes. Indeed, Della Spina (2020) based her framework on the HUL approach to select criteria, and the framework is mentioned in various studies. Yet, none of the other frameworks included in our review use or are grounded on the other five frameworks, and it may be relevant to further investigate why this is the case. Moreover, it is noteworthy to mention that we found no framework guiding heritage reuse processes in the span between planning (after selection of reuse alternative/intervention) and evaluation.

Criteria (and indicators)

Several of the studies reviewed comprised criteria and indicators against which MCH reuse can be evaluated, either in ex-ante or in ex-post assessments. We find both commonalities and differences between criteria and indicators suggested for ex-ante and ex-post assessments.

In general, criteria and indicators suggested by the studies reviewed are quite comprehensive and cover a wide range of aspects relevant for sustainable development. There are, however, sets of criteria focused on environmental aspects to facilitate ex-ante assessments (e.g., Magrini & Franco, 2016; Stajonevic et al., 2021) and ex-post evaluations of MCH reuse (e.g., Foster et al., 2020). Criteria proposed for ex-ante assessments belong to traditional sustainability dimensions (economic, environmental, and socio-cultural), but refer also to multidimensional values, impacts, benefits and/or performances, as well as to functionality/usability and regulatory aspects. Moreover, some of these frameworks (Besana et al., 2018; de Gregorio et al., 2020; Dell’Ovo et al., 2021) integrate criteria at different levels of analysis to consider aspects at both the building and the local context in the decision-making process.

Similarly, some of the sets of criteria proposed for ex-post evaluations are categorized along traditional environmental, social, and economic sustainability dimensions (Durukan et al., 2021), but also recur in other categorizations. For instance, Bosone et al. (2021) propose 40 criteria to assess the impacts of adaptive reuse of MCH from a circularity perspective, which they categorize into a regenerative dimension referring to the capacity of MCH to “self-regenerate” over time (e.g., authenticity and integrity, energy efficiency, financial sustainability); a symbiotic dimension englobing relations that bring along benefits (e.g., local identity, participation); and a generative dimension including externalities and impacts (e.g., job creation, soil consumption savings, wellbeing) capacities. At an aggregate level, the criteria proposed for ex-post assessments include but are not limited to natural and social capital, cohesion and inclusion, participation, real estate, tourism and recreation, financial return, cultural activities, local production, cultural values, wellbeing, resilience, prosperity, knowledge, and skills.

Like in frameworks proposed to conduct ex-ante assessments, we also find indicators requiring measurements and analysis at multiple levels (heritage site, local/urban, regional, national) in ex-post evaluation frameworks, but mainly across and not within frameworks (as was the case in ex-ante assessment frameworks). Of particular interest is the evaluation framework proposed by Gravagnuolo et al. (2021), which contains performance indicators to assess the contribution of MCH reuse to sustainable urban objectives, thus, linking MCH’s own sustainability performance to that of its context. Moreover, in contrast to frameworks aimed to facilitate ex-ante assessments, in which criteria and indicators are formulated in more general terms, in frameworks proposed to assist ex-post evaluations, indicators tend to be more specific and are more often accompanied by units of measurement.

Yet, data on particular aspects may not be readily available, and working with indicators can place too much focus on aspects for which data is available and/or demand significant competence and resources (Groven & All, 2020). It thus seems relevant to investigate how to evaluate aspects that are not easily measurable, as well as how to facilitate the use of indicators among practitioners.

Moreover, a final but important point is that indicators are also open to subjective interpretation (Bosone et al., 2021). Selection of criteria and indicators is intrinsically related to the methodologies used to develop frameworks. As we note above, in most cases, frameworks are grounded on previous studies and, eventually, experts' opinions, with little engagement of other stakeholders. Only few studies opted for adapting criteria to fit the specific case/context (e.g., Aigwi et al., 2019; 2020; Dell'Ovo et al., 2021) or for the engagement of non-experts (Della Spina et al., 2020; Torrieri et al., 2019) in their selection. While this may strengthen scientific relevance, it can have unfortunate practical consequences that demand further attention.

Methods used in MCH reuse decision-making processes

Preceding the evaluation and ranking of alternatives upon selected criteria, several of the frameworks suggest starting with collecting data to e.g., identify relevant stakeholders, assess MCH's values and/or understand contextual circumstances and needs (e.g., Besana et al., 2018; Capolongo et al., 2019; Rossitti et al., 2021; Torrieri et al., 2019). Li et al. (2021) contend that comprehensive assessments are required before implementing any reuse project. For Blagojevic and Tufegdžic (2016), converting functionally obsolete buildings in ways that respect their values, authenticity and integrity is challenging, and frameworks that consider buildings' aesthetic integrity and their structural and functional capacity to accommodate new uses and meet standards can contribute towards delivering successful heritage reuse processes. Moreover, understanding the heritage site itself improves our understanding of its vulnerability (Haroun et al., 2019).

A further element typically comprised in frameworks designed at early stages of the decision-making reuse process are multicriteria decision-making analysis (MCDA) methods. These methods are regarded as useful tools to facilitate recognition of the diversity of stakeholders and the integration of their perspectives and knowledge; foster consideration of multiple objectives, interests and criteria; include non-monetary impacts and benefits; enable systematic evaluation and comparison of alternatives; and secure transparency in the ranking and prioritization/selection processes (Aigwi et al., 2019; Della Spina, 2020; Della Spina, 2021; Oppio & Dell'Ovo, 2021; Gravagnuolo et al., 2021c; Morkunaite et al., 2019; Torrieri, 2019; Vehbi et al., 2021). It is, thus, not surprising that various frameworks (e.g., Aigwi et al., 2019; 2020; Sladowski et al., 2021) include MCDA methods to facilitate consideration of multiple criteria in ex-ante assessments of MCH reuse projects to select and prioritize particular use functions, cases and/or interventions.

MCDA can be implemented using various specific methods and techniques. With Haroun et al. (2019) reporting the existence of up to 100 different MCDA methods, it is not possible within the scope of this paper to provide a comprehensive review of them. Yet, based on the literature reviewed, we identify and describe the main phases characterizing MCDA processes (figure 3).

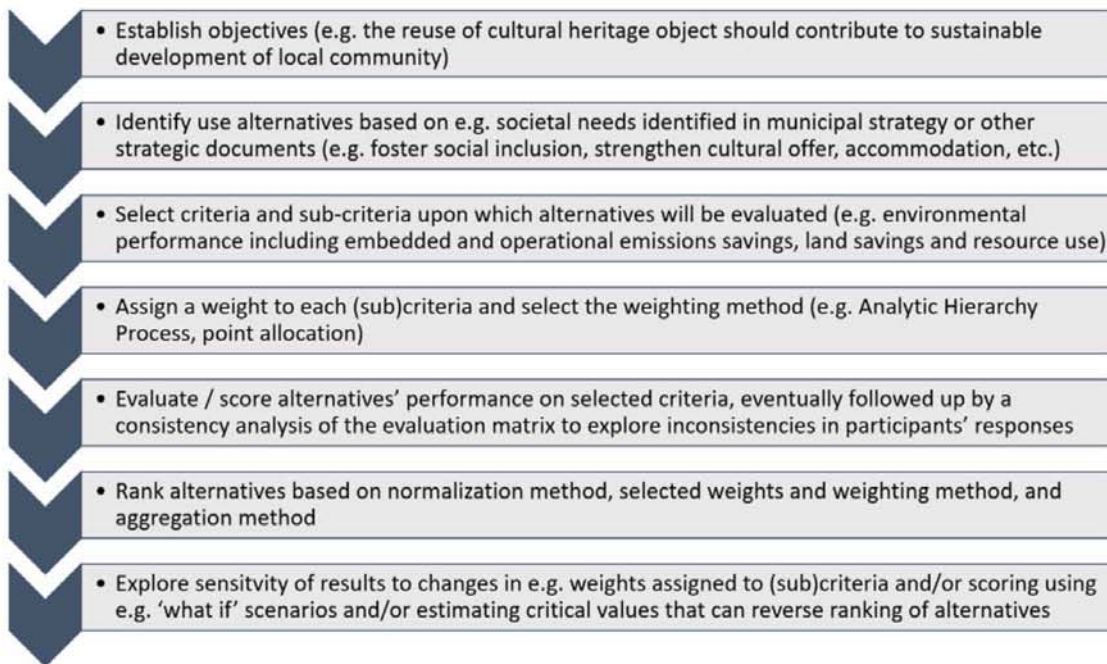


Figure 3. Main steps in multi-criteria decision analysis processes. Source: own elaboration based on Aigwi et al. (2019), Capolongo et al. (2019), Della Spina (2020), Haroun et al. (2019), Salerno (2020) and Vehbi et al. (2021)

As illustrated in figure 3, the selection of more specific methods is needed in key steps of the MCDA process to weight criteria, normalize data, and aggregate scores. Similarly, there are also various ways to perform consistency and sensitivity analysis. The selection of these methods depends on the specific case and problem (Della Spina, 2020; Haroun et al., 2019; Salerno, 2020), with some scholars (e.g., Della Spina, 2020; Morkunaite et al., 2019; Salerno, 2020) suggesting that their combination is often useful when dealing with decision-making problems pertaining to CH.

In principle, MCDA methods allow for the engagement of stakeholders. Yet, as argued by Li et al. (2021), we also observe that studies reporting application of MCDA methods seem not to have exploited this opportunity, as they tend to rely on engagement of experts and technicians and leave out the perspectives of a wider range of stakeholders. It thus seems pertinent to further investigate why methods that are supposedly appropriate to considerations of multiple criteria and perspectives, fail in doing precisely this. To counteract this, Li et al. (2021) suggest combining MCDA (top-down) methods with bottom-up approaches to elicit people's preferences including semantic differential, stated preference, and means-end chain methods. Also, Oppio et al. (2017) suggest exploring the combination of choice experiments with MCDA methods. Yet, although we do find examples of frameworks incorporating SP methods, we found no study combining them with MCDA methods. We do, however, find frameworks combining MCDA methods with financial assessments such as Discounted Cash Flow Analysis of prioritized alternatives to

evaluate their financial feasibility (e.g., Della Spina et al, 2020; Della Spina, 2021; Ros-sitti et al., 2021; Torrieri et al., 2019).

Guidance material

Like in the case of frameworks, our literature review did not retrieve any guideline to holistically integrate sustainability principles and criteria in MCH reuse projects from design to evaluation. However, a range of research projects and institutions have published guidance material on aspects that may be useful to consider in MCH reuse process.

The EU Horizon 2020 funded ROCK project² has built on heritage-led urban regeneration experiences from seven European role model cities to develop tools and policies that support urban transformations in three further European cities. Dane et al. (2019) suggest the following six steps when working with adaptive reuse in historic centres: 1) analysing the status; 2) establishing vision and goals; 3) identifying and involving stakeholders; 4) identifying the changes; 5) implementing and communicating the changes; and 6) defining long-term management strategies. Following a similar approach – but focused on rural areas – the EU Horizon 2020 RURITAGE project³ has produced guidelines for identification of stakeholders (Perello et al., 2018), a methodology for community-based heritage management and planning (Perello et al., 2020), and a toolkit comprising various methods to facilitate landscape valuation (Martin et al., 2021), in addition to the monitoring program (Olmedo & Barrientos, 2020) presented above.

The Interreg EU project Forget Heritage has developed a management manual and templates to guide cultural heritage-based revalorization projects along the following steps: 1) goals setting; 2) stakeholders' identification and relationships; 3) mapping/identifying potential uses; 4) identification of necessary requirements (infrastructure, planning, processes, tools) to implement uses; 5) developing a business model and a financial plan; 6) planning implementation of the project (Herrmann & Trunk, undated). And the EU funded project 'Cultural Heritage Counts for Europe' (Europa Nostra, 2015) proposes a methodological toolbox to assess the impacts of cultural heritage comprising both quantitative and qualitative participatory and non-participatory methods, in addition to the research framework mentioned in the introduction.

In Norway, the District Centre and the Directorate for Cultural Heritage compile guidelines on a range of instruments and methods to e.g., conduct landscape resource analysis (RA, 2018) and identify and assess MCH values (RA, undated), identify stakeholders⁴ and/or link reuse processes to general sectorial plans and regulatory frameworks (RA, 2013; RA, 2020). However, as with the case of frameworks guiding

2. ROCK: Re-use and Optimisation of Cultural Heritage in Creative Knowledge Cities

3. RURITAGE: Rural regeneration through systemic heritage-led strategies

4. <https://distriktssenteret.no/verktoy/aktoranalyse/>

or evaluating cultural heritage processes, we found no integrated guiding material supporting decision-making and implementation of MCH reuse processes. How then, can MCH reuse processes contribute to sustainable development?

Discussion and conclusion

Policymakers have increasingly begun to recognize the role of material cultural heritage (MCH) as a resource to be actively used for sustainable development (SD). Reusing MCH has gained attention as a strategy that contributes to creating positive social, cultural, economic, and environmental impacts, while safeguarding MCH for future generations, both internationally and in Norway. Yet, although empirically-based knowledge on the implications of reusing MCH is scarce, it suggests that MCH reuse does not necessarily translate into solely positive impacts. Moreover, research suggests that implementing MCH reuse processes in ways that contribute to SD is far from straightforward, considering the challenges of operationalizing sustainability, the range of actors responsible for MCH management and the various conflicts between goals and interests. Against this background, the results from the literature review presented in this paper generate new knowledge that can inspire further research and inform the development of instruments to support policy goals that strive to enhance the contribution of MCH to SD in two ways: 1) it reveals knowledge gaps and practical hurdles that can hinder the putting of policy goals into practice; 2) it identifies needs and opportunities to be followed up in subsequent research.

Firstly, we found no frameworks, models and/or guidelines that enabled the integration of sustainability principles and criteria into MCH reuse projects in a holistic manner – from design to evaluation. Various scholars (Blagojevic & Tufegdžic, 2016; Haroun et al., 2019; Li et al., 2016) and reviewed frameworks propose starting the reuse process by collecting data to understand the MCH's own and contextual characteristics, heritage values and community needs and challenges. Selecting a balanced reuse option that safeguards the MCH and is adapted to local needs and challenges is, clearly, crucial in affecting the contribution of the reuse process to SD. Consequently, it is not surprising that existing tools and guidelines focus on planning phases. Our review reveals some inspirational frameworks, in so far as their application allows for the incorporation of multiple criteria relevant for SD to inform choices at early phases of the reuse process and for the evaluation of the implications of implementing them. Yet, implementing and communicating changes and defining long-term management strategies are also key steps (Dane et al., 2019), and practical tools are needed to support these phases.

Secondly, if MCH reuse projects are to be evaluated on their capacity to contribute to SD, we need to operationalize SD. Indicators can be useful to do this, and the literature reviewed suggests that sustainability criteria (and indicators) are essential to guide and prioritize choices and/or evaluate the impacts of reusing MCH. The studies reviewed provide an extensive range of criteria and indicators that are relevant to

consider, including indicators operating at different level of analysis (site/local/regional). Yet, with up to over 170 indicators (Nocca, 2017), existing sets of criteria are too extensive to be incorporated into a manageable set of indicators. Moreover, working with indicators implies challenges related to insufficient data availability, lack of time, resources and/or expertise (Groven & All, 2020; Lundberg et al., 2022). Although they prove useful to define and monitor goals, they are also open to subjective interpretation (Bosone et al., 2021) and can create biases on what is measured (Groven & All, 2020). In sum, indicators are a crucial element, but it is challenging to deploy them in practice.

Thirdly, our review casts light on the fundamental differences across methodological approaches to develop frameworks to guide or evaluate reuse of MCH, indicating limitations in the breadth of stakeholders engaged in MCH reuse processes. The recurrent use of MCDA methods in the frameworks retrieved by our search is positive considering that these methods facilitate the integration of multiple criteria and perspectives, systematic evaluations and transparent decision-making processes (Aigwi et al., 2019; Della Spina, 2020; Della Spina, 2021; Morkunaite et al., 2019; Oppio & Dell'Ovo, 2021; Torrieri, 2019; Vehbi et al., 2021). However, one might question how inclusive the application of frameworks to select functions is when criteria and weightings have been already pre-selected by experts. As illustrated by our results, there are various ways of performing and implementing MCDA, and the mere use of these methods does not warrant broad stakeholder engagement. This can be viewed as a major drawback considering that engaging multiple stakeholders facilitates capturing a wider range of values, needs, challenges and aspects influencing and affected by MCH reuse projects. This provides a more comprehensive picture of the implications of reusing and may increase awareness about potential negative and/or conflicting issues instead of overly focusing on positive aspects, which can heighten expectations and increase dissatisfaction. In turn, identification of negative impacts facilitates re-consideration of reuse alternatives and/or implementation of measures to mitigate those impacts. And recognition of conflicts can also contribute to more legitimate processes (Hillier, 2002), which in turn can heighten acceptance levels. Moreover, facilitating engagement and participation is also aligned with national policy goals aimed at engaging society at large in cultural heritage protection and use (KMD, 2020).

Fourthly, we know little about MCH reuse processes in Norway, and whether (and eventually how) sustainability principles and criteria are incorporated into these processes. Moreover, our review indicates that guidance material is lacking. None of the frameworks reviewed was developed/applied in a Norwegian context, and guidelines – though existing – are fragmented and not comprehensive enough. This is also substantiated by experiences, in which MCH has been at the centre, of broad value creation strategies (DS, 2017) and by experiences of integrating sustainability goals into municipal planning (Lundberg et al., 2020), which suggest that it is necessary to increase the visibility of neglected issues and conflicts, enhance knowledge about

planning tools, and facilitate access to guidance material, tools and methods to evaluate what cannot be measured.

Considering the challenges of managing MCH reuse towards SD, the insufficiency of frameworks, guidelines and methods to guide, evaluate and (particularly) implement MCH reuse processes revealed by our review is troubling. Yet, our review also provides inklings to be considered by further research and policy-making.

Results suggest that an orderly compilation of relevant, yet currently fragmented methods, and guidance material to assist MCH reuse process can be useful and help us identify some phases, tasks and elements that seem key in these processes (figure 4).

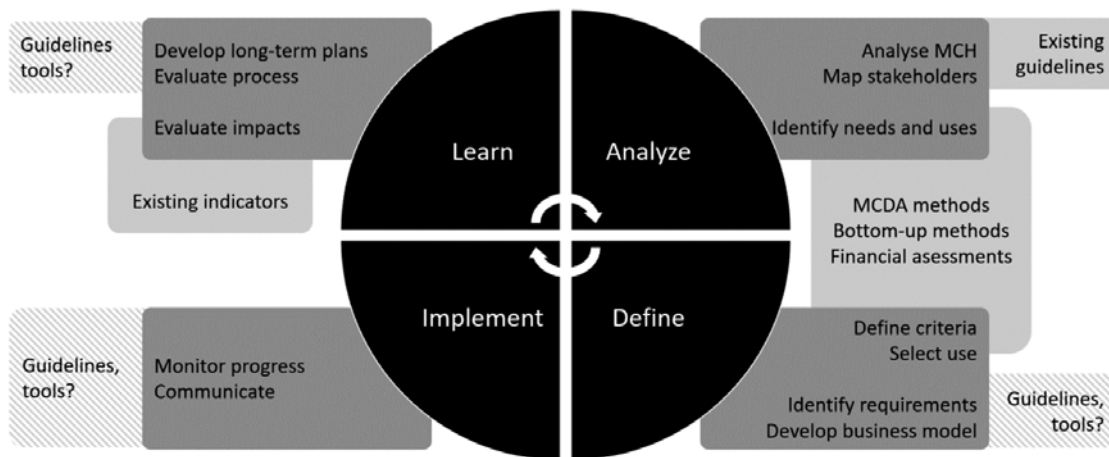


Figure 4. Tentative sketch of phases, tasks, methods and tools to assist MCH reuse processes (Source: own elaboration)

Among these elements, the selection of MCDA methods and criteria/indicators seem crucial. MCDA methods especially differ in their clarity and transparency and their capacity to engage various stakeholders, to include a large number of criteria and/or alternatives, to allow for intercriteria compensation and to consider interrelationships. If the goal is to engage non-expert audiences, an essential feature to consider is how easy these methods are to understand and use to elucidate whether they require being combined with participatory bottom-up/people-centred approaches. When it comes to the selection of criteria and indicators, if the scope is to develop nationally relevant instruments, research is needed on how to balance two apparently contradicting notions: being broad enough to embrace various values, needs and aspects while allowing for concretization in particular MCH cases and places.

Yet, looking forward, in addition to the ‘what’, it will be key to investigate and reflect ‘how’ these pieces can be best put together to produce practically relevant instruments that enable interested parties to work towards ambitious policy goals and enhance the contribution of MCH to SD. Tools developed without the engagement of relevant stakeholders can compromise the capacity to balance various interests and, thus, the opportunities to build on multiple sources of knowledge, gain a

more thorough understanding, and generate shared choices. Yet, instruments grounded on too specific challenges and needs may not be transferable to other contexts.

The design of instruments to follow up on policy goals in Norway and increase awareness about the sustainability implications of using obsolete MCH will need to critically reflect upon these methodological aspects which, in turn, may affect how SD is operationalized in MCH reuse processes and the level of stakeholder engagement they opened for. Moreover, instruments will need to adapt to different realities and needs, considering that management of CH in Norway is fragmented across administrative levels and extends beyond formal structures, with the strong engagement of individuals and civil organizations (KMD, 2020).

Funding

This study is co-funded by the Research Council of Norway, project no. 320655, and in-kind contributions of collaborating partners.

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Annex – Resources included in our literature review

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