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Linking cultural ecosystem services with individual and collective wellbeing in recreational urban blue spaces: insights from Danang, Vietnam

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ABSTRACT

Urban green and blue spaces contribute many non-material benefits to human wellbeing. However, there are many gaps at this interface including (a) unclear conceptualisation of the mechanisms mediating the linkages between the non-material benefits of Nature and human wellbeing, (b) disproportionate focus of studies on individual wellbeing than collective wellbeing, (c) lack of understanding of possible synergies and trade-offs between individual and collective wellbeing. Here, we aim to unravel the linkages between the non-material benefits of Nature with individual and collective wellbeing. We focus on recreational cultural ecosystem services (CES) from urban blue spaces in a rapidly transforming tourism-dependent coastal city in Vietnam. We elicit these linkages through in-depth interviews and deliberative focus group discussions (FGDs) with the local community, and systematise the linkages through causal loop diagrams. We find that recreational CES from blue spaces contribute to eight constituents of individual wellbeing, namely physical health, mental health, subjective well-being, spirituality, personal identity and autonomy, learning and capability, connectedness and belonging, and economic wellbeing. Recreational CES also contribute to five constituents of collective wellbeing, namely open communication, collective actions, communion, tolerance and distributive justice. We identify 12 mechanisms mediating these linkages, with the most important ones being regenerative, cognitive, cohesive, collaborative and destructive mechanisms. We also observe that recreational CES create synergies and trade-offs between different constituents of wellbeing. We particularly note trade-offs and synergies among constituents of individual and collective wellbeing such as trade-offs between economic wellbeing (constituent of individual wellbeing) and distributive justice (constituent of collective wellbeing), among others.

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1. Introduction

Cities are interlinked social-ecological systems characterised by dense human population and multiple dynamically interacting socioeconomic, cultural, political and environmental processes (Andersson et al. 2015). Urban green and blue spaces contribute to human wellbeing via different cultural ecosystems services (CES) (Fleming and Shwartz 2023) and non-material Nature's Contributions to People (NCPs) (Labib et al. 2022), many of which emerge through non-material human-nature connections. Examples include positive effects on physical/mental health (Chan 2017), education (Shanahan et al. 2015), social cohesion (Campbell et al. 2016) or sense of place (Cabral et al. 2017). However, the change, degradation or loss of urban green and blue spaces causes the degradation/loss of CES or non-material NCPs (Slawsky et al. 2022), negatively affecting human wellbeing (Gairola and Noresah 2010). For example, urban green space transformation to built-up land can have detrimental effects on human health (Tzoulas et al. 2007) or social cohesion and sense of belonging (Cook and Swyngedouw 2012).

Many of these non-material human-nature connections emerge through nature-based recreation and leisure activities such as swimming, bird watching or outdoors social gatherings (Ahtiainen et al. 2013), which are essentially physical, experiential, intellectual, spiritual and symbolic interactions with Nature (Haines-Young 2018), with multiple effects on human wellbeing (Clara et al. 2018). The often intangible and intersecting nature of these linkages complicates their understanding (Bryce et al. 2016) but is crucial for informing urban design.

In many parts of the word, rapid urbanisation strongly interacts and intersects with tourism expansion (Hall 2005). This can affect nature-based recreation and leisure from urban green and blue

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spaces, notably affecting the wellbeing of local residents and communities (Pyke et al. 2016). For example, urban expansion in peri-urban coastal areas through large-scale tourist infrastructure (e.g. resorts), residences and ancillary infrastructure (Lim et al. 2019) might improve economic development but also degrade ecosystems essential for the wellbeing of local communities (Serna-Lagunes 2022). Similarly, urban green and blue space are often reconfigured to meet tourists' demands, without necessarily considering local residents' needs (Wang and Yotsumoto 2019). Such transformation processes offer valuable opportunities to explore the interface between the non-material benefits of Nature and human wellbeing.

Yet, there are multiple research gaps at this interface of urban green/blue spaces transformation, non-material benefits of Nature and human wellbeing, whether related to recreation or more general. First, we lack good knowledge of the mechanisms mediating the links between non-material benefits of Nature and human wellbeing (Huynh et al. 2022). Second, effects and mechanisms related to collective wellbeing have received much less attention than individual wellbeing, considering both their inadequate conceptualisation in prominent global initiatives (MA 2005; IPBES 2019) and empirical research. Third, communities are arguably much more than just an aggregation of individuals (Wilkinson 1991), necessitating the exploration of the relationships between individual and collective wellbeing, as they may not be necessarily positively correlated. To our best knowledge, no study has effectively conceptualised synergies and trade-offs between individual and collective wellbeing in the context of human-nature relationships in urban areas. Fourth, most relevant literature has predominantly emphasised on urban green spaces (e.g. parks and forests) overlooking the unique benefits and challenges of urban blue spaces (e.g. beaches, rivers and lakes).

Here, we aim to bridge these gaps by unravelling how the non-material benefits of Nature contribute to different constituents of individual and collective wellbeing. We focus specifically on recreational cultural ecosystem services (CES) from urban blue spaces in a rapidly transforming and tourism-dependent coastal city in Vietnam (Danang). We elicit these linkages through in-depth interviews and deliberative focus group discussions (FGDs) with local community members, systematising them through causal loop diagrams. Specifically, we address three research questions:

- How have urban blue spaces and their capacity to provide recreational CES changed over time?
- Through what mechanisms do CES from recreational blue spaces contribute to individual and collective wellbeing?
- What synergies and trade-offs emerge between constituents of wellbeing and collective wellbeing?

2. Methodology

2.1 Conceptual framework and research approach

2.1.1 Conceptual framework

Figure 1 outlines the conceptual framework used in this study, comprising three main elements (a) processes at interface of urbanisation and tourism driving urban blue space change, (b) provision of recreational CES/NCPs from urban blue spaces and (c) impacts on individual and collective wellbeing via different mechanisms.

Components (a) and (b) draw heavily from the conceptual frameworks of the Millennium Ecosystem Assessment (MA 2005) and the Intergovernmental Policy-Platform on Biodiversity and Ecosystem Services (IPBES 2019) on CES and non-material NCPs, respectively. Component (c) draws from frameworks of individual and collective human wellbeing (Wilkinson 1991; Russell et al. 2013; Bentley Brymer et al. 2020), and how CES are linked to human wellbeing (Huynh et al. 2022).

Regarding (a), drivers are the natural or anthropogenic processes/phenomena that directly or indirectly cause ecosystem and biodiversity change (MA 2005; IPBES 2019). Here, we perceive that this interface of intensive tourism development and urban transformation creates pre-conditions for the emergence of many direct and indirect drivers of urban blue space change that partially or completely alter them (incl. their uses and benefits). We specifically focus on beaches in Danang (Study area) that contribute to individual and collective human wellbeing via recreational CES (see next paragraphs).

Regarding (b), urban blue spaces (specifically beaches in this study) provide benefits to local residents and communities via nature-based recreation. Here, we use the concept of CES to capture the material and non-material benefits of nature-based recreation (MA 2005). Mindful of conceptual advances related to non-material human-nature relations, we consciously choose the framing/terminologies of CES and human wellbeing (MA 2005) over NCPs and quality of life (IPBES 2017) due to the relatively more mature literature at this stage of the former (see point 'c' below).

Regarding (c) our starting point is that human wellbeing is a broad and contested concept, comprising multiple dimensions and constituents (Russell

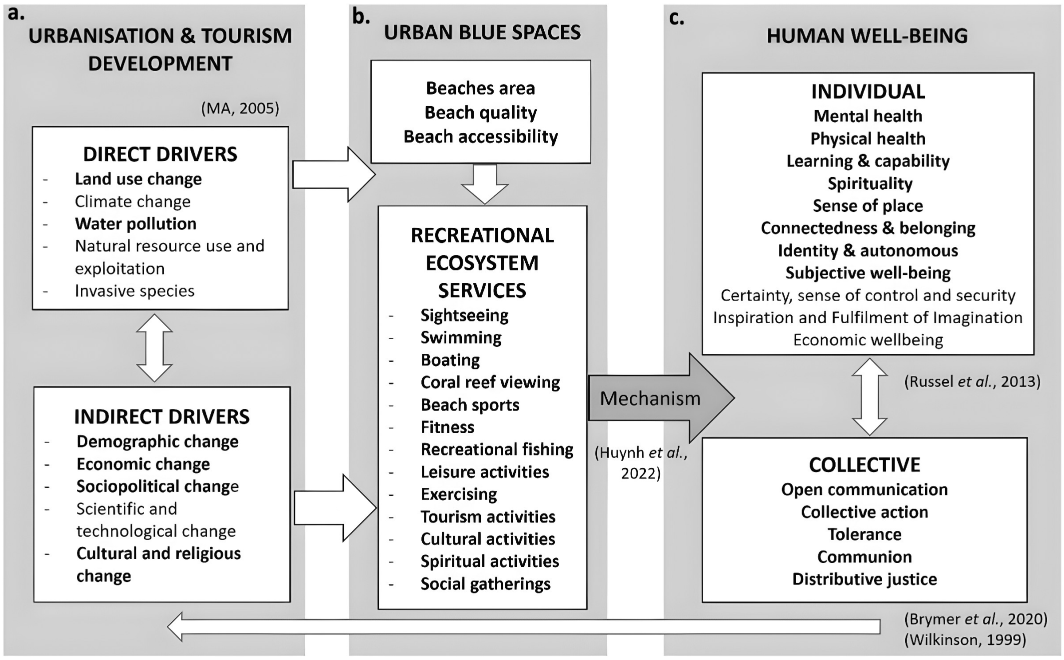


Figure 1. Conceptual framework of the study. Note: the sub-components of the conceptual framework were as following: (a) direct and indirect drivers of urban blue space change, (b) provision of recreational CES/NCPs from urban blue spaces and (c) effects of recreational CES on individual and collective wellbeing via different mechanisms. We populated the conceptual framework based on other frameworks, including MA (2005), Russell et al. (2013), Bentley Brymer et al. (2020), Wilkinson (1991), Huynh et al. (2022). The concepts/dimensions within each of these base frameworks were pre-defined before collecting the data, but not all were observed in our case study due to context-specificity. We indicate in bold all concepts/dimensions observed to our case study in Danang city.

et al. 2013; Huynh et al. 2022). Yet collective (or community) wellbeing is distinct from individual wellbeing. Though collective wellbeing is arguably dependent on individual wellbeing, it is not simply an aggregate measure of individual wellbeing (Bentley Brymer et al. 2020). The pursuit of collective and individual wellbeing can be synergistic and/or remarkably different depending on context, meaning that failure to consider both risks leading to the piecemeal understanding of how urban green/blue spaces (and their change) affect local communities.

At the individual's level, we view individual wellbeing as a synergistic and multi-dimensional concept whose multiple constituents, when combined, characterise the positive state of individuals (Russell et al. 2013). We use the following constituents of individual wellbeing: (a) physical health, (b) mental health, (c) spirituality, (d) learning and capacity, (e) identity and autonomy, (f) connectedness and belonging, (g) subjective wellbeing and (h) economic wellbeing. Most have been adopted from Russell et al. (2013) and are explained in more detail in Table 1.

Table 1. Constituents of individual and collective wellbeing.

Scale	Wellbeing constituent	Description
Individual	Mental health	Person's condition with regard to psychological, emotional wellbeing
	Physical health	Person's condition with regard to the functioning of the body and physiological metrics
	Connectedness and belonging	Social connections, sense of belonging to a larger community, connection with nature and with life
	Learning and capability	Cognitive performance including information, understanding, learning, perspectives and acquired skills and capabilities
	Spirituality	Connections to other entities that go beyond what is generally considered as physical and emotional health
	Identity and autonomy	The part of being who a person is, freedom, independence
	Subjective wellbeing	Self-reported assessments of overall individual well-being
	Economic wellbeing	Financial security to meet a person's needs
Community (collective)	Open communication	Effective information sharing channel and information flows, communications are honest, open, complete and authentic
	Collective action	Working together in achieving a share purpose or common interest, often fostering mutual support, social relationships and community cohesion.
	Communion	Purposeful and joyful engagement in social relationships, marked by a sense of belonging, shared meaning and mutual celebration of community life, reflecting a wilful and emotionally resonant participation in collective experiences and togetherness.
	Distributive justice	Recognition of human equity and equality, actions to remove inequalities
	Tolerance	Respect, acceptance of differences and similarities

Source: (Russel 2013; Wilkinson 1991).

At the community[1] level, we perceive collective wellbeing as differentiated from (but dependent upon) individual wellbeing, and emphasising human pursuits of social interactions and solidarity (Wilkinson 1991; Bentley Brymer et al. 2020). Collective wellbeing is closely linked with social interactions in the expression and achievement of shared purposes, common needs and solutions of common problems, as well as spatial elements such as attachment to place and community of residence (Bentley Brymer et al. 2020). We adopt an interactional view here, and the following constituents from Wilkinson (1991) (Table 1): (a) open communication, (b) collective actions, (c) communion, (d) tolerance and (e) distributive justice.

CES are linked to human wellbeing in very different ways. We adopt here the mechanisms defined by Huynh et al. (2022) (a) regenerative, (b) satisfactive, (c) communicative, (d) cohesive, (e) intuitive, (f) transcendentive, (g) cognitive, (h) evolutive, (k) retrospective, (l) remunerative and (n) destructive (for definitions refer to Table 2).

Finally, these mechanisms can create synergies and trade-offs between multiple wellbeing constituents. Within the scope of this study, synergies refer to situations where a recreational service from blue spaces contributes positively to two or more wellbeing constituents simultaneously. In contrast, trade-offs arise when a recreational service enhances one aspect of wellbeing but has a negative effect on another. These concepts focus on perceived internal reinforcements or dissonances among multiple dimensions of wellbeing, as articulated by study participants. They do not reflect broader issues such as access, institutional power or the distribution of benefits across different social groups.

2.1.2 Research approach

The research aims to elicit how the non-material benefits of Nature contribute to different constituents of individual and collective wellbeing (Section 1). In particular, we unravel the different mechanisms through which urban blue spaces (specifically beaches) and their change, affect individual and collective wellbeing.

Our approach draws from phenomenological research, which emphasises the qualitative exploration of the essence of lived experiences surrounding a particular concept or phenomenon (Miller and Salkind 2002). Phenomenological approaches have been widely applied to examine human–nature relationships in diverse contexts (Cortes-Vazquez and Ruiz-Ballesteros 2018; Schweitzer et al. 2018), including for CES (Ryfield et al. 2019). In this study, we draw on the lived experiences of local community members to systematically understand how urban blue spaces (and their transformation) affect individual and collective wellbeing.

For individual wellbeing, we use extensive one-on-one discussions with local community members from different demographic and socioeconomic segments

Table 2. Definition of mechanism linking recreational CES and human wellbeing and examples provided by respondents.

Mechanism	Definition	Examples provided by respondents
Regenerative	The generation of restorative outcomes (e.g. alleviation of fatigue and emotional stress) through recreation, leisure, tourism, escapism and therapy via interaction with nature	Stress reduction, relaxation, calm, peacefulness tranquillity, escapism, refresh, healthy, rejuvenating, psychological benefits, illness recovery, healing.
Satisfactive	The feeling of satisfaction and fulfilment of expectations and needs associated with interaction with nature	Joy, happy, wonder, amazed, enlightened, fulfilled, novelty, satisfaction.
Communicative	The development of social communication and conversation via interaction with nature.	Communication, channel of information, social gathering, networking, connect to wider community.
Cohesive	The development of meaningful relationships between people via interaction with nature.	Sympathy, respect, understanding, sharing, connecting, strengthen bonds, relationship building.
Intuitive	The sensual experiences, human instincts and feelings (often of a spiritual and religious nature) via interaction with nature	Connect to something larger, connect to people who passed away, spiritual meanings, transformation of self, spiritual healing, spiritual enlightenment.
Transcendentive	The benefits that lie beyond the ordinary experiences and the regular physical realm, more often associated with religious or spiritual values through interaction with nature	Transcendental experiences of mythical space, find inner child, spiritual enlightenment, spiritual healing, customary religious and ritual activities.
Cognitive	The development of knowledge and understanding through interaction with nature.	Learn about: nature, marine, ecosystem, biodiversity, environment, social skills, communication skills, survival skills, fishing and livelihood, local traditional food
Evolutive	The gradual change of people's personality, moods, feelings, attitude, perception, behaviour, values and belief systems over time (more often internal change) via interaction with nature.	Gradual changes: environmental awareness, caring for nature and the area, civic stewardship, sense of reflection, put things into perspectives, lifestyle, courage and self-esteem
Retrospective	The personal memories and reflections of the past through prior interaction with nature	Childhood memories, place attachment, visited places, the past, the previous landscape, longstanding social norms.
Collaborative	The involvement of two or more people working together for a shared purpose	Shared purposes, purposive involvement, collaboration, working together, common needs, common goals.
Remunerative	The economic benefits people obtain from ecosystems through non-material benefits in cash or other forms of money	Economic growth, additional income, tourism revenue, livelihoods
Destructive	The direct negative impacts on individuals or communities resulting from interactions with nature or from the loss of CES. These impacts may affect health, social relationships, financial stability, or individual and collective capabilities	Stressed, hurt, annoying, loss of biodiversity, loss of culture, conflicts, unfair, negative, destroyed.

Note: Definitions adopted from (Huynh et al. 2022). Examples elicited from individual interviews and FGDs.

to elicit linkages between recreational CES and wellbeing constituents. Participants were asked to articulate as individuals how engagement with urban blue spaces and their transformation provides and affects access to recreational CES, and how in turn this affects different constituents of individual wellbeing.

For collective wellbeing, we adopt a deliberative approach that engages the same community members in group settings. These deliberative approaches elicit how recreational CES from urban blue spaces contribute to constituents of collective wellbeing and map synergies and trade-offs between constituents, asking participants to articulate responses as part of a group. Such deliberative approaches have been used to elicit the value of ecosystem services (Xepapadeas and TEEB 2010), including different aspects of CES (Slovák et al. 2023). Contrary to individualistic value elicitation exercises, in group deliberation settings, social values and preferences are elicited via *mutual discussion* rather than direct aggregation of individual values (Wilson and Howarth 2002; Zia et al. 2015). Deliberative approaches enable participants to critically justify their own preferences among peers but also be exposed to alternative perceptions (Irvine et al. 2016). The aim is reaching an informed collective judgement based on broader social values than aggregating individual values and preferences (Wilson and Howarth 2002; Xepapadeas and TEEB 2010).

We must note that although our deliberative approach drew from existing theoretical framework to guide methodology design, it explicitly aimed at eliciting locally grounded understandings of wellbeing and non-material human–nature connections. We prioritised eliciting the participants' values and lived experiences in their own language, rather than applying predefined categories. In this sense, the theoretical framework did not serve as a rigid value elicitation template, but as a flexible analytical lens to surface, explore and organise local meanings that might otherwise remain implicit or difficult to articulate.

2.2 Study area

Danang is a coastal city located in central Vietnam, spanning 1,285 km^2 of land with a population of 1.13 million people (Statistical Office 2019) (Figure 2). The population increased ~40% in the past 20 years (684,000 residents in 1999 to 1.13 million in 2019) (PCDC 2020). It is the major economic centre of central Vietnam, and the third richest city nationally with an average annual gross regional domestic product increase of 7.8% between 2015 and 2020 (Danangtv 2020).

The landscape has extensive beautiful beaches (70 Km), voted one of the seven most beautiful beaches globally by Forbes Magazine (Statistical Office 2019). Furthermore, the very diverse topography includes sandy beaches, cliffed coasts and Son Tra peninsula that provides biodiverse ecosystems and eco-tourism opportunities. Collectively, these blue spaces provide multiple recreational opportunities to local communities and tourists.

The tourism sector expanded rapidly and is now a major economic activity contributing to 31.4% of

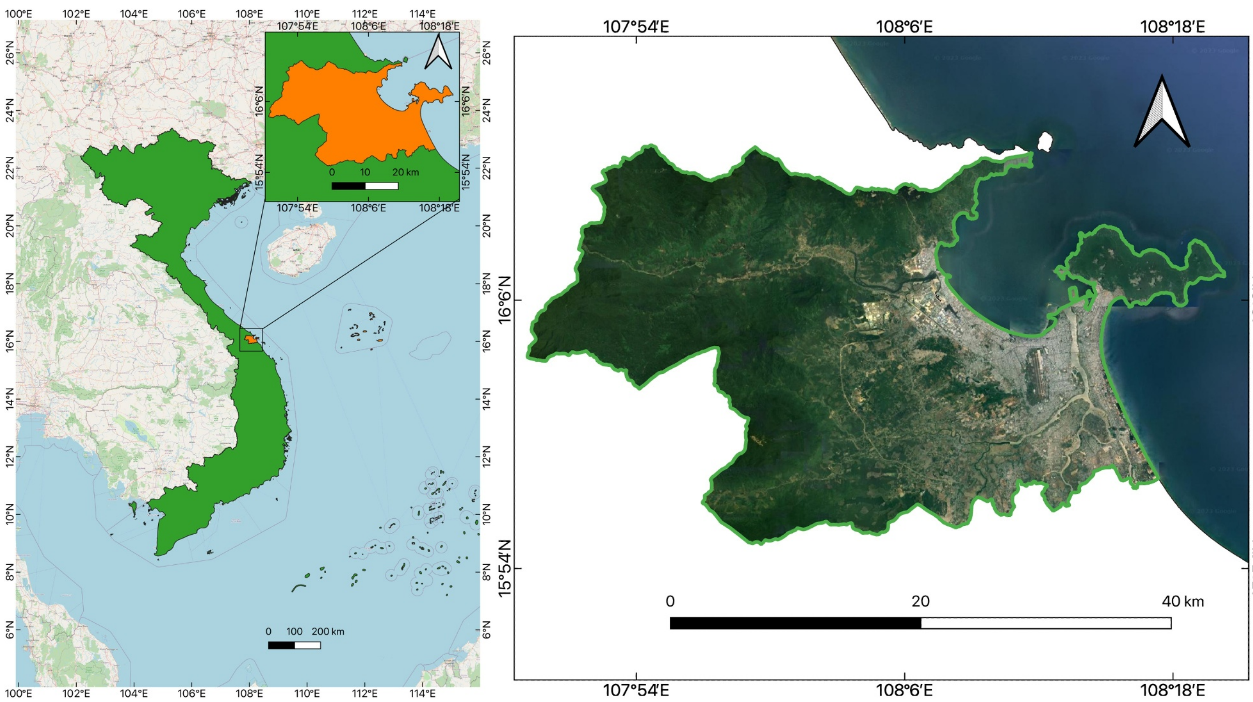


Figure 2. Geographical location of study site - Danang city, Vietnam.

city's economy in 2019 (Vietnamplus 2022). Yet, tourism development is an important force of urban transformation. The real estate sector is booming (expected compound annual growth rate of 22% per year for 2021–2024) in its effort to cater both to the increasing population and demand for holiday homes, increasingly from international investors (CBRE 2022).

This fast-paced tourism development is spearheaded by luxury hotels, resorts and other facilities intensively built along the shoreline at a breakneck pace. This has caused the progressive privatisation of beach fronts, particularly in Ngu Hanh Son District where an estimated 12 km of coastline has been allocated for resort premises by private investors, reducing access for local residents (Vietnamnet Global 2018). At the same time, public beaches such as My Khe have become overcrowded, littered and characterised by unsanitary conditions (Nguyen 2024). This reflects certain tensions between fast-paced tourism development, urban transformation and equitable access to urban blue spaces.

2.3 Data collection

Data collection consisted of four phases: field visits for context understanding (Phase 1), in-person interviews for individual perception elicitation (Phase 2), Focus Group Discussions for group perception elicitation (Phase 3), and online survey (Phase 4). Due to COVID-19 restrictions, the interviews (Phase 2) and FGDs (Phase 3) were conducted online in Vietnamese and then transcribed and translated to English.

Phase 1 involved two field trips (August 2019 and March 2020) to understand ecosystem changes, social and environmental characteristics of local communities, and tourism impacts. Although the first author is a native of central Vietnam and lived in Danang for 6 years, these visits deepened the understanding of local culture and behaviour towards blue spaces. Beaches were identified as the study blue space due to their role in individual and collective wellbeing, and the significant impact of tourism on their accessibility.

Phase 2 entailed 14 in-depth individual interviews with local community members (July–August 2021) to understand the mechanisms linking recreational CES from beaches with constituents of individual human wellbeing. Interviews contained multiple sections: (a) background of respondents, (b) beach use, experiences and activities, (c) mechanisms linking recreational CES and wellbeing, (d) perception about current beach conditions and dynamics and (e) trade-offs and conflicting interests from beach recreation. Each interview lasted 60–90 min and was conducted in Vietnamese by the lead author.

The sample population was 'local community members that use blue spaces for recreational purposes', as they are most likely those affected by change in these blue spaces, in turn affecting their recreational activities and ultimately their wellbeing. By 'local', we refer to communities (and community members) living in close geographical proximity to beaches in Danang that have experienced change, as they arguably have deeper connection to these blue spaces and would reflect better on both processes of change and wellbeing outcomes (i.e. study phenomenon).

Based on literature review, experience living in Danang (1st author) and preliminary fieldwork (Phase 1) we identified five major geographic, demographic and socioeconomic factors that differentiate beach use and experiences: (a) geographic location, as different coastal areas of Danang have undergone different changes, and thus the people frequenting these beaches are likely to have different experiences; (b) respondents' demographic and socioeconomic characteristics (i.e. age, gender and income), as they likely affect the reasons, ways and frequency of beach use; (c) livelihoods, as people with different reliance on beaches and proximate marine environment (e.g. fishers, tourism sector and no livelihood from beaches), are likely to be affected in different ways by beach change.

Based on this, we employed purposive stratified sampling to ensure that the selected respondents reflected a good spread across all these factors. Table S1-S2 (Supplementary Material) outline, respectively, the respondents' characteristics and the socioeconomic profile of Danang for age, gender, income and livelihoods. Selected participants reflect well the general characteristics of the target population but were not weighed to be proportional to the spread of each factor. This is because we do not seek to quantify the wellbeing outcomes of recreational CES (i.e. identify on aggregate which constituents of wellbeing are affected and how much), but rather to map which aspects of wellbeing are affected and how (i.e. through which mechanisms). The final sample size was decided through saturation analysis (Data analysis). Saturation was achieved during the 11th interview, beyond which no new mechanisms linking recreational CES and individual wellbeing were identified. We conducted three additional interviews after saturation point to confirm saturation as it is common in qualitative research (Saunders et al. 2018). Despite the differing characteristics of these participants, no new mechanisms emerged after the 11th interview, thus finalising the sample size at 14 participants.

In Phase 3, two focus group discussions (FGDs) were held with the 14 respondents to explore the links between recreational CES from urban blue spaces and collective wellbeing. FGDs were conducted in September 2021, each lasting about 4 hours and consisting of four main activities. The first activity was on problem framing, with the first author providing information through a short presentation about urban blue spaces in study area, introduction of wellbeing, trade-offs and synergies, and the current blue space management plans. The second activity required participants to jointly identify how beach-based recreational CES affect collective wellbeing. The third activity involved a group discussion on how beach recreational experiences lead to synergies and trade-offs between individual and collective wellbeing constituents. The final activity involved discussing recommendations to mitigate the negative impacts of current tourism activities on urban blue spaces.

The deliberative activities did not necessarily aspire to achieve consensus. Their main function was to discuss about collective wellbeing, psychologically conditioning the respondents to feel as members of the community rather than individuals. We did not seek consensus answers (unless they naturally came up) as different individuals have different legitimate views on how Nature (and its change) influences collective wellbeing (and its change), which are sometimes irreducible. The group activities were designed to enable participants to share their personal experiences, welcoming contrasting ideas and perceptions. Several studies using deliberative processes at this interface of Nature and people do not necessarily seek consensus between participants but rather elicit rich information from the group interactions, with some studies seeking consensus at later stages, e.g. to develop policy recommendations or inform collective decisions (Raymond et al. 2014; Kenter et al. 2016).

In Phase 4, all 14 respondents completed as individuals an online survey within a week of the FGDs. The survey was developed after thematic analysis of Phases 2 and 3 (Data analysis) to rank (on a scale of 0–10) the importance of each pathway between recreational CES and wellbeing constituents.

The research was approved by the University of Tokyo's Research Ethics Committee in May 2021. Study design and fieldwork were guided by a deliberate intention to safeguard participants' identities and ensure that their experiences were treated with respect and cultural sensitivity. This was facilitated by the prior long-term residence and employment of the first author in Danang, which helped facilitate trust, allowing participants to share their experiences in a safe and respectful environment.

2.4 Data analysis

We conducted relational content analysis for the individual interviews and FDGs transcripts adopting a semi-inductive coding approach. Most terms were pre-defined within the conceptual framework outlined in Conceptual framework and research approach and its underlying components. However, we kept an open mindset that allowed for new concepts and narratives to emerge from the data (McKibben et al. 2020). Furthermore, it allowed us to explore better the relationships between the main concepts (i.e. CES, mechanisms and human wellbeing constituents) and identify themes and similar patterns (Koufogiannakis et al. 2004).

The coding was done manually using the transcripts of the individual interviews and FGDs, and in close succession using the outcomes of each step as inputs for the next (Data collection). The first coding was conducted following Phase 2 (individual interviews) to identify the mechanisms linking nature-based recreational CES from beaches to individual wellbeing and the current perceived problems for recreational experiences. The results of the first coding were used to inform the design of the FGD protocol and activities (Phase 3). The second coding was conducted following the FGDs (Step 3) to elicit the different mechanisms linking nature-based recreation CES and collective wellbeing. Like individual interviews, we used semi-inductive coding to identify these linkages, synthesising the data from both workshops in the same figure.

To visualise linkages between recreational CES and individual/collective human wellbeing (Change in blue spaces and recreational activities-3.3), we developed causal loop diagrams (CLD). CLDs are ideal tools to systematise such diverse phenomena and have been used in several studies on social-ecological systems (Bouchet et al. 2022) and ecosystem services valuation (Lopes and Videira 2015). We used the Vensim PLE Plus Software for CLD creation. Through the coding outlined above, we identified the related variables and their relationships, indicating positive direction for a relationship (+) when variables change in the same direction, and negative (-) when they change in the opposite direction. Mechanisms that created similar linkages between CES and human wellbeing were grouped and visualised with different colours in the CLDs. We used a Sankey Chart (Linkages of recreational ces with collective wellbeing) to represent the trade-offs and synergies between the different constituents of human wellbeing identified through the third FGD activity.

Finally, we assessed the relative importance of individual pathways linking CES and constituents of human wellbeing through the online survey (Phase 4). We averaged scores (0–10) for all respondents and estimated the standard deviation.

At the same time as the individual interviews (Phase 2), we conducted a saturation analysis to ensure that the interviews covered all relevant mechanisms linking CES and human wellbeing. The saturation point was defined as the juncture at which no new mechanisms emerged from additional respondents and was reached after the 11th interview (Figure S1, Supplementary Material).

2.5 Acknowledgements and limitations

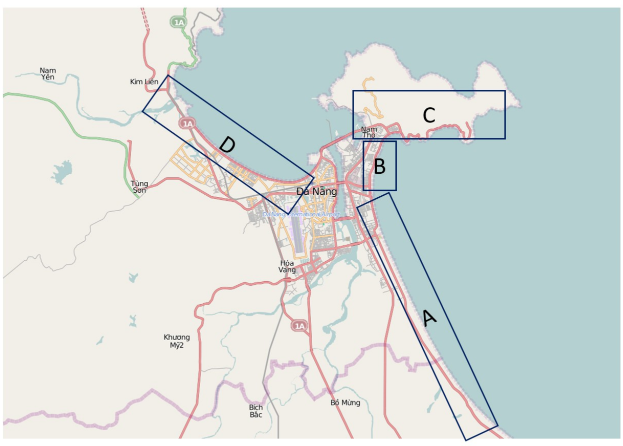
Despite the comprehensive perspective of our research approach, we must acknowledge here some possible limits to generalisability due to the specific aim and scope in the design and framing of this study, as well as methodological limitations during data collection (see Box S1, Supplementary Material for extensive discussion). First, we must acknowledge possible limits to generalisability of identified linkages between CES and human wellbeing due to the specific scope, context and sample of the study. Second, we must note that although the CES and NCP frameworks offer a useful structure for articulating non-material contributions of Nature, they are less equipped to capture relational ontologies and place-based ethics, particularly in rapidly changing, culturally diverse urban contexts. Third, although our approach is centred on community-defined meanings, it does not directly engage with broader political and historical forces such as colonial, neoliberal or technocratic governance that shape how cultural values are constructed and contested in ecosystem planning. Fourth, there were some constraints related to online data collection due to the COVID-19 lockdowns, especially for the FGDs.

3. Results

3.1 Change in urban blue spaces and recreational activities

Interviews and FGDs revealed that local communities value highly the multiple recreational experiences provided by beaches. These experiences are spatially stratified and concentrated in 'hotspot areas' (Area A-D, Figure 3), characterised by unique topography, landscape features and leisure functions. These blue spaces in these areas offer specific combinations of recreational experiences, which have significantly changed over the past 20 years due to tourism development and urban transformation. Changes are driven directly by land use change and water pollution, and indirectly by shifts in demographic characteristics, livelihoods, socio-cultural values, consumption patterns, and beach access and use regimes.

Area A has experienced significant tourism development, leading to land use change and water pollution. Investments in beach facilities have altered the coastline, with luxury resorts creating conflicts with local communities and coastal erosion. Public beaches have been privatised, limiting local access. Wastewater facilities struggle to meet demand, leading to water pollution, especially during heavy rainfall. Respondents perceived that tourism development increased the provision of tourism-related recreational activities such as sightseeing, beach sports and outdoor recreational activities, while decreasing the provision of recreational activities associated with local culture



Legend	Ecosystem services bundle
A	(1) Sightseeing (2) Swimming (3) Boating (4) Coral reef viewing (5) Beach sports (6) Leisure activities (7) Social gathering (8) Exercises (9) Traditional food culture (10) Cultural (11) Tourism activities
B	(9) Traditional food culture (12) Recreational fishing (13) Local knowledge &education
C	(1) Sightseeing (11) Tourism activities (13) Local knowledge & education (14) Spiritual & religious (15) Biodiversity & genetic resource
D	(1) Sightseeing (2) Swimming (6) Leisure activities (7) Social gathering (8) Exercises (9) Traditional food culture (12) Recreational fishing (13) Local knowledge & education

Figure 3. Main beach areas providing recreational CES in Danang city. The inlet table summarises the direct and indirect drivers of ecosystem change identified in each area and the changes in the provision of recreational CES as identified in the individual interviews and FGDs.

and tradition. This suggests certain mismatches between the supply and demand of certain recreational CES in the area (denoted by '↑↓' in Figure 3).

Area B, known for its food culture and fishing, has experienced urbanisation linked to the expansion of residences, restaurants and fishing activities. This area provides recreational experiences associated with local culture/knowledge, linked to fishing livelihoods and culinary traditions (Danang is famous for seafood cuisine). However, recreational fishing demand from the local people has declined as young people shift to hospitality jobs.

Area C, a nature conservation area with diverse flora and fauna, has experienced some ecological change through eco- and spiritual tourism, leading to landscape reconfiguration and minor deforestation. The upper part of the peninsula contains the Linh Ung pagoda and the statue of Son Tra Goddess of Mercy,[2] which is the most significant Buddhist pilgrimage destination in Vietnam. Respondents perceived that spiritual and tourism activities increased, but local knowledge and biodiversity-related activities have decreased (e.g. erosion of ecological knowledge for forest and coral reef management).

Area D is characterised by sandy beaches that have gradually been developed into tourist attractions. It has considerably potential for outdoor recreational experiences such as sightseeing, recreational fishing, leisure and social gathering. However, this demand is low and mainly for the local community. The population growth has overwhelmed wastewater treatment plants, leading to water quality degradation during heavy rainfalls, affecting recreational activities.

3.2 Mechanism linking CES from recreational urban blue spaces with individual wellbeing

The individual interviews suggest that recreation from blue spaces contributes to eight constituents of individual wellbeing, namely physical health, mental health, subjective wellbeing, spirituality, personal identity and autonomy, learning and capability, connectedness and belonging, and economic wellbeing. We also identify 10 distinct mechanisms mediating these linkages: regenerative, satisfactive, intuitive, transcendentive, retrospective, cognitive, evolutive, cohesive, communicative and destructive. Figure 4 visualises how these mechanisms mediate linkages and help us identify six main themes characterising linkages. Table S3 (Supplementary Material) illustrates the main themes discussed below through quotes of the respondents.

The primary theme pertains to the direct associations between recreational urban blue spaces and residents' physical health, mental health and subjective wellbeing, through regenerative and satisfactive mechanisms. Respondents reported the highest average scores for contributions to health (score = 9.0, SD = 1.1) and subjective wellbeing (score = 8.1, SD = 2.1) via regenerative mechanisms, which refer to the generation of restorative outcomes like relaxation, stress reduction and recovery from engagement with Nature. Activities such as swimming, jogging and playing sports at the beach contribute significantly to physical health. Furthermore, beach visits encourage healthier dietary choices. For mental health, many respondents mentioned the positive psychological effects resulting from their visits to beaches. The regenerative mechanisms often work together with the satisfactive mechanisms, which refer to the fulfilment of expectations and the feeling of satisfaction of individuals obtained from engaging with Nature through leisure. In particular, respondents reported feelings of joy, happiness and satisfaction during beach activities, contributing to improving their subjective wellbeing. Notably, younger participants highlighted satisfactive benefits from beach sports, while older individuals emphasised regenerative effects through relaxation and mental recovery.

The second theme pertains to connections between recreational CES and sense of connectedness and belonging, facilitated by cohesive (score = 7.8, SD = 1.2) and communicative (score = 8.1, SD = 1.2) mechanisms. Cohesive mechanisms involve the cultivation of significant relationships through nature-based recreational beach activities. For example, older people reported that regular beach visits for morning exercise can enhance social bonds and foster cohesion, while younger individuals reported that the beach serves as a social hub for gathering, dating and socialising. Respondents indicated that the beaches provide an ideal setting to bring people closer, build better relationships and inspire caring and respect for others.

The third theme relates to linkages between recreational urban blue spaces and learning and capability via cognitive (score = 7.2, SD = 0.7) and evolutive (score = 6.3, SD = 0.8) mechanisms. Activities such as fishing, boating and diving can equip individuals with knowledge about marine ecosystems, local culture, and practical survival and social skills, promoting capability and self-esteem. Learning and capability benefits manifest also via evolutive mechanisms, associated with the gradual change of an individual's personality, attitude, perception, behaviour, values and belief system over time via interaction with Nature. Many respondents reported becoming more open, caring and socially engaged through beach-based recreation. Frequent visitors also expressed greater civic responsibility and environmentally conscious behaviours. These benefits were noted across both young and older participants.

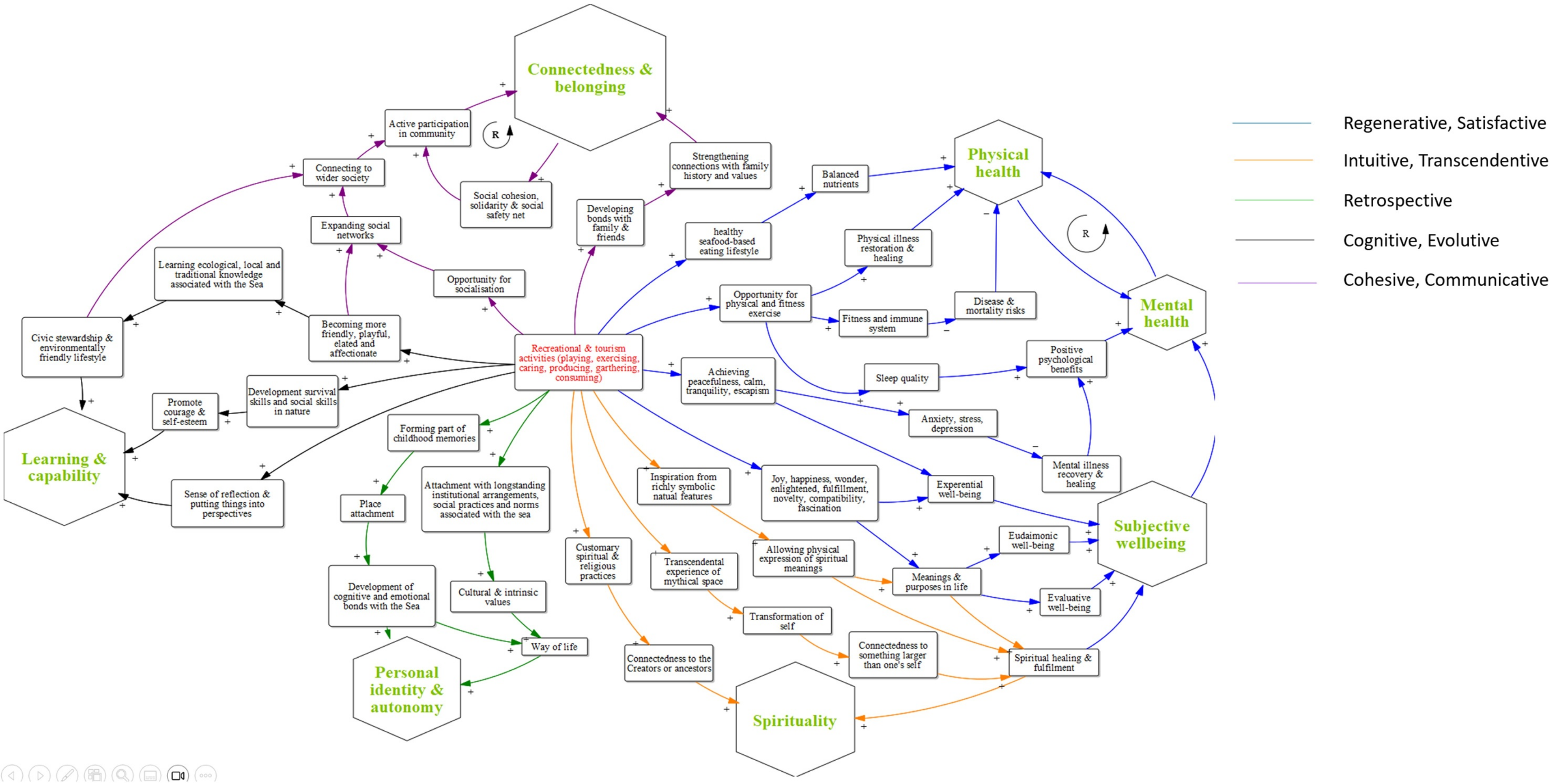


Figure 4. Mechanisms linking recreational CES and constituents of individual wellbeing. The hexagons with green text indicate constituents of individual wellbeing. The colours of the arrow denote mechanisms that have similar impacts on constituents of human wellbeing. The signs (±) represent the direction of relationships between any two variables. '+' denotes positive association and '–' denotes negative association. Destructive mechanisms are not visualised.

The fourth theme explores the contribution of urban blue spaces to spirituality via intuitive (score = 6.9, SD = 0.8) and transcendentive (score = 7.2, SD = 1.1) mechanisms. Intuitive mechanisms relate to sensual experiences and feelings, often spiritual or religious, derived from interaction with Nature. For some individuals, the sea's symbolic features (e.g. wave, wind, water and smell) provide spiritual fulfilment through activities like yoga and meditation. Transcendentive mechanisms reflect benefits beyond ordinary experiences, with some respondents engaging in rituals or religious practices that foster a sense of connection to the divine or the deceased. These spiritual benefits were more commonly expressed by women, with ritual participation more prevalent among older respondents.

The fifth theme relates to the contribution of recreational urban blue spaces to personal identity and autonomy via retrospective mechanisms (score = 7.0, SD = 1.0), which refer to personal memories and reflection of the past. For many respondents, the sea and beach activities formed a significant part of their childhood, reinforcing place attachment. Longstanding connections with the sea seem to also shape local culture, social norms and a shared sense of identity for both young and older respondents.

The intersection of tourism and urban transformation (Section 2.5) alters the provision of certain beach-related recreational activities, impacting local residents' wellbeing both positively and negatively. The expansion of tourism and recreational facilities improves the supply and quality of some recreational CES in some beaches, positively affecting many aspects of individual wellbeing. Conversely, the degradation of blue spaces in some other areas through pollution, overcrowding, privatisation and coastal erosion causes the loss or deterioration of specific recreational experiences (Figure 3).

The sixth theme (Figure 4) highlights how the loss or degradation of recreational CES negatively affects individual wellbeing through destructive mechanisms, which refer to harms to health, finances, relationships or personal life due to diminished nature-based benefits. Many respondents mentioned that the shift from pristine public coastal areas to overcrowded and restricted tourism-dominated beaches (due to beachfront privatisation) has created mismatches in terms of a growing demand and shrinking supply of quality recreational activities for local communities (particularly in Area A; Figure 3). The most affected wellbeing dimensions include mental health (score = −8.1, SD = 1.0), subjective wellbeing (score = −7.2, SD = 1.2) and spirituality (score = −7.0, SD = 1.0).

3.3 Mechanisms linking CES from recreational blue spaces with collective wellbeing

The FGDs identified linkages between recreation from blue spaces with five constituents of collective

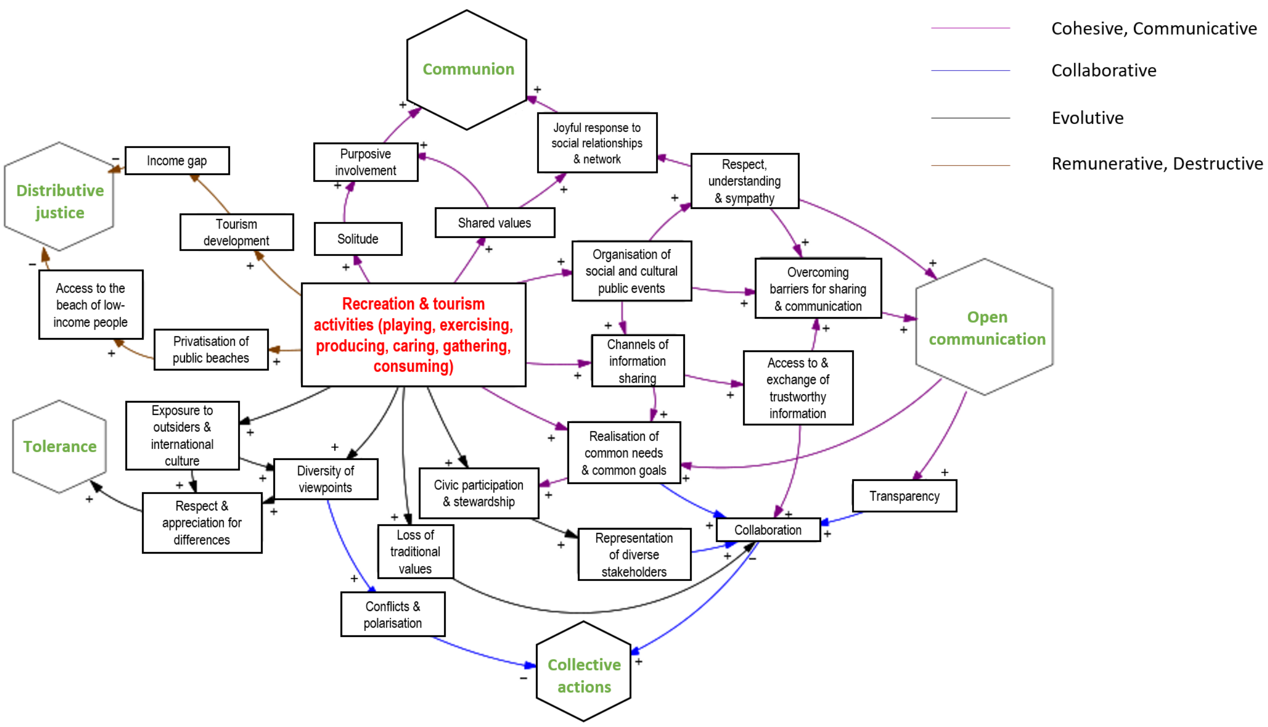


Figure 5. Mechanisms linking recreational CES and constituents of collective wellbeing. The hexagons with green text indicate constituents of collective wellbeing. The colours of the arrow denote mechanisms that have similar impacts on constituents of human wellbeing. The signs (±) represent the direction of relationships between any two variables. '+' denotes positive association and '–' denotes negative association. Destructive mechanisms are not visualised.

wellbeing (i.e. open communication, collective action, communion, tolerance and distributive justice) via six mediating mechanisms (i.e. cohesive, communicative, remunerative, collaborative, evolutive and destructive). Figure 5 visualises how the mechanisms mediate linkages, and Table S4 (Supplementary Material) outlines some main linkages discussed below through quotes of the respondents.

First, recreational activities that entail socialisation (e.g. waste collection, beach festivals) contribute significantly to collective action and communion constituents, primarily through collaborative mechanisms (score = 6.7, SD = 0.7). These mechanisms relate to individuals coming together to work towards shared goals, often in the form of community-driven initiatives. Such beach-based social events serve not only to foster a sense of purpose but also to reinforce a shared responsibility for the coastal environment. The FGDs revealed that participation in such events helps strengthen communal bonds and generate a sense of belonging. These shared experiences can cultivate social capital, including related to trust, reciprocity and mutual aid, which in turn support broader civic engagement and environmental stewardship.

Second, recreational activities affect the open communication and communion constituents via cohesive and communicative mechanisms. The main difference of these mechanisms between the individual and collective wellbeing (see Change in blue spaces and recreational activities) lies on the emphasis towards shared purposes and common goals at the collective level, compared to personal relationships at the individual level. For example, many respondents mentioned the desire to exchange trustworthy information and forge effective communication channels during recreation-based social events organised at the beaches.

The third main theme relates to negative collective wellbeing outcomes associated with intensive and fast-paced tourism development. The most notable are negative effects on distributive justice (score = 7.0, SD = 1.2), which are associated with the loss of access to some blue spaces and the tourism-driven income gap between some community members.

Both these outcomes have strong equity undertones, the former associated with the loss of equitable access to blue spaces and the latter with the widening income inequality within the community. In terms of inequitable access, several respondents highlighted that the privatisation of public beaches (especially in area A) and the re-purpose of those coastlines for resorts restricted their ability to access these formerly public beaches, thereby limiting their ability to benefit from leisure activities. In terms, of income inequalities, many respondents reported that some locals (particularly landowners near the coast and tourism service providers) have gained significant financial benefits from tourism very rapidly, often becoming ‘suddenly rich’. Conversely, others have not benefited in the same way (even in the same community) but have been adversely affected by the exponential increase in land price in heavily touristic areas. This growing income inequality is arguably linked to distributive injustice, reportedly having psycho-social effects to some participants causing feelings of superiority or inferiority, and associated insecurity and stress.

The fourth main theme relates to the increasing presence of foreigners and tourists in recreational blue spaces (and Danang more broadly). This has exposed many locals to foreign cultures, which though generally positive, and it is also associated with a gradual erosion of traditional values and the normative standard of respect and tolerance within the community via destructive mechanisms (score = 6.7, SD = 1.1). For example, many senior respondents mentioned the ‘negative impacts of westernisation’ on young generations, as exemplified through changes in lifestyle and fashion and lack of respect for the local culture. Collectively, such phenomena create preconditions for conflict and polarisation within the community.

3.4 Synergies and trade-offs between constituents of wellbeing

Figure 6 represents the perceived synergies and trade-offs between different constituents of human wellbeing, as mediated by recreational CES. Respondents generally perceived more synergies than trade-offs in the wellbeing outcomes provided by recreational CES, as outlined below.

First, some recreational activities create synergies between the constituents mental health, physical health and subjective wellbeing. Examples include recreational activities in area A and D such as swimming, beach sports and fitness that tend to improve simultaneously these three constituents. Such synergies are likely to be found at beach areas near the city centre, which are equipped with appropriate facilities (e.g. public beach exercise facilities, changing rooms for swimmers and sport equipment rental facilities). Aesthetically appealing landscape elements such as manicured tropical vegetation are associated with enhanced subjective wellbeing, in turn having synergistic effects with mental health and physical health.

Second, we identify also synergies between the wellbeing constituents spirituality, mental health, and connectedness and belonging. In particular, some recreational activities such as traditional fishing and local food appreciation (Area B), visiting pagodas (Area C), and yoga and meditation (Area D) are likely to have positive effects on mental health, while at the same time bringing people closer

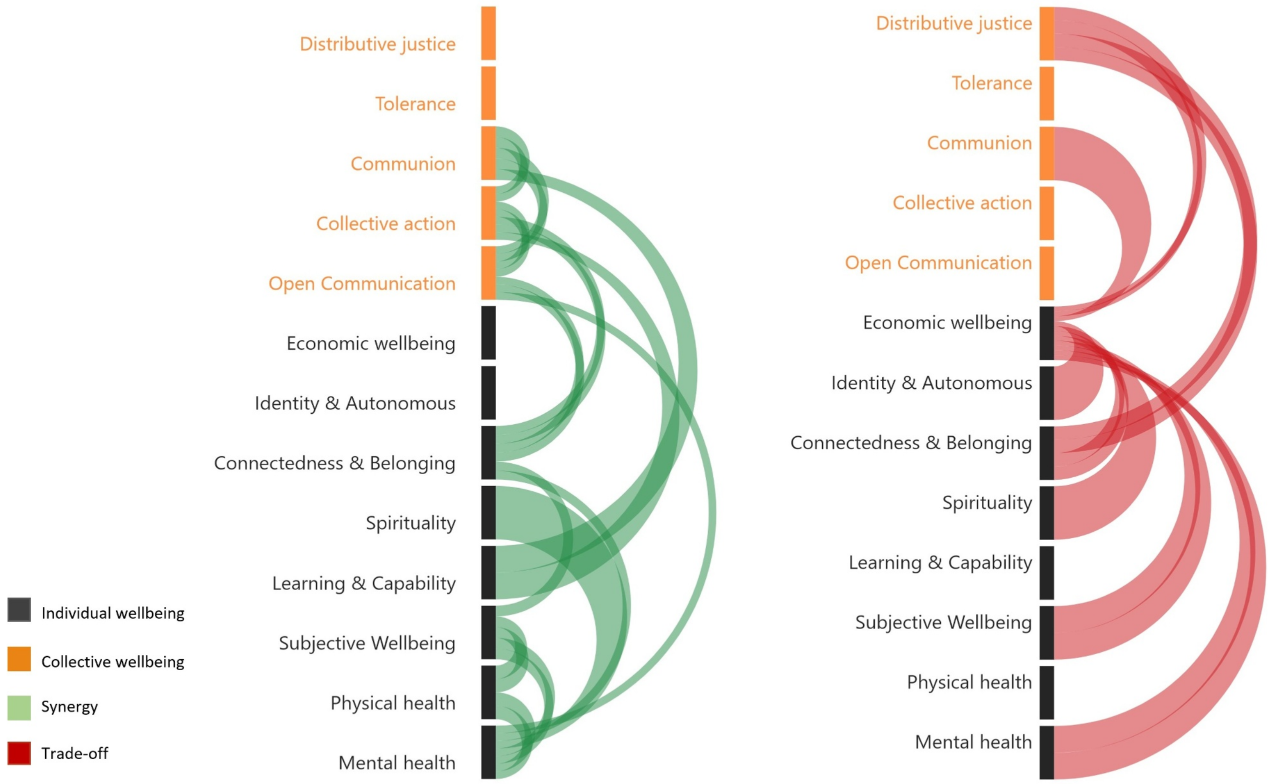


Figure 6. Trade-offs and synergies between constituents of human wellbeing. There are eight individual wellbeing constituents and five collective wellbeing constituents affected by recreational CES in urban blue spaces. Synergies represent the co-benefits that recreational urban spaces provide to multiple wellbeing constituents. Trade-offs represent that recreational urban blue space may contribute positively to one constituent but undermine another constituent. The links were extracted during the synergies and trade-offs mapping activity of the FGDs. All links identified during the two workshops were aggregated and visualised in this Figure.

together with their family, friends and other community members.

Third, we observe synergies between constituents of individual and collective wellbeing, notably between connectedness and belonging with most collective wellbeing constituents. For example, respondents indicated that beach social gatherings with strong environmental elements such as community events and volunteer activities can help participants feel more connected with the community, while facilitating collective actions and open communication, and social capital in the forms of trust, shared value, cooperation and reciprocity.

Fourth, some recreational CES also create synergies between learning and capability with most collective wellbeing constituents. Recreational activities with strong environmental components and educational aspects (e.g. cultural tours and traditional fishing) are likely to inspire people to engage in stewardship and collective action activities (e.g. environmental conservation), consequently benefiting collective wellbeing.

Conversely, we identify some trade-offs between economic wellbeing and spirituality, health, and subjective wellbeing. For example, although tourism development has provided significant economic benefits to some local community members (Mechanism linking recreational urban blue spaces with individual wellbeing), they have also compromised the quality of recreational experiences of community members in Area A (e.g. crowded and dirty tourist beaches, public spaces converted for tourism facilities), negatively impacting mental health, subjective wellbeing and spirituality.

Finally, we also observe some trade-offs between distributive justice with several other wellbeing constituents, and more notably economic wellbeing. For example, as discussed in Mechanism linking recreational urban blue spaces with individual wellbeing, tourism development in areas A and D brought new economic opportunities to coastal areas (e.g. job creation, increased income for community members involved in hospitality or owning land near high-value beaches). However, others have experienced reduced access to blue spaces due to beach privatisation and rapid increase in land price. These have been perceived as injustices, with some respondents expressing concern that while tourism can boost local economies, it can also create social inequalities.

4. Discussion

4.1 Delineating the multiple pathways linking recreational CES and human wellbeing

All respondents indicate that nature-based recreational blue spaces in Danang are important for their individual wellbeing and the wellbeing of their local communities. Importantly, these recreational activities make these contributions through very different mechanisms. Through the interviews, FGDs causal loop diagrams (Figures 4 and 5), we identify 12 mechanisms underpinning the wellbeing outcomes of recreational CES.

At the individual level, we identify effects on eight constituents of human wellbeing (Change in blue spaces and recreational activities), namely physical health, mental health, subjective well-being, spirituality, personal identity and autonomy, learning and capability, connectedness and belonging, and economic wellbeing. The highest positive effects are for health (Table S5, Supplementary Materials), followed by connectedness and belonging via the development of meaningful relationships, social bonding and cohesion through nature-based recreational activities. Studies have explored such connections between non-material benefits of Nature and the specific wellbeing constituents (Russell et al. 2013; Ode Sang et al. 2016), including through deep attachments and connections with Nature (West et al. 2018).

However, we also identify negative effects to practically all constituents of individual human wellbeing (Table S5, Supplementary Materials) via destructive mechanisms, catalysed by processes at the interface of urbanisation and tourism that degrade blue spaces and reduce the supply and quality of recreational CES. The loss of recreational CES that people used to have in the past (but not anymore) was associated with negative feelings and emotions affecting mental health, subjective wellbeing and spirituality. Studies have explored how the inappropriate reconfiguration of urban green and blue spaces can indeed create such negative human wellbeing outcomes (Georgiou et al. 2021)

At the collective level, we identify effects on five constituents of collective wellbeing: open communication, collective actions, communion, tolerance and distributive justice (Mechanism linking recreational urban blue spaces with individual wellbeing). The highest positive contributions relate to collective actions, with social interactions and knowledge generation/sharing during recreational activities being the main underlying mechanisms. Some social interactions during recreational activities in beaches (e.g. community gatherings) build trust and social capital, which are important for enabling communities deal better with risks and change (Olsson et al. 2004; Bentley Brymer et al. 2020). In addition, participation in social recreational events that improve ecological knowledge or forge cultural values is likely to engage people in environmental stewardship and social work, which can promote collective wellbeing. This echoes literature arguing the importance of learning and knowledge in assisting community adaptation to new conditions to sustain wellbeing, build trust among community members and facilitate natural resource management (Dam Lam et al. 2019).

Negative effects to collective wellbeing are mostly associated with the constituents of tolerance and distributive justice (Table S5, Supplementary Materials). Our findings reflect similar related themes in the literature on tolerance and justice in urban spaces such as ‘access’, ‘use’, ‘mismatch in supply and demand’ and ‘conflicts’ (Brink et al. 2016; Assmuth et al. 2017). We also unpacked through respondents’ perceptions some understudied themes such as the psycho-social effects, feelings, insecurity and stress associated with the aforementioned issues. Recognising such psycho-social aspects, different groups’ needs and their relations with others urban blue space users is arguably inherent to improve collective wellbeing.

We should indicate that the outcomes of the two deliberative exercises were slightly different. The first group focused heavily on mechanisms linking to the collective wellbeing constituents of tolerance and distributive justice, while the second group focused more on linkages to collective actions and communion. We hypothesise that this is likely due to the different ways that individuals may view community issues, and thus that different combinations of participants might lead to different discussions. This implies that in contrast to individual interviews where we see a thematic saturation point (Figure S1, Supplementary Materials), it is not possible to ensure whether such a saturation point was reached during the deliberative processes (or even if it could be reached or tested) (Box S1, Supplementary Material). In other words, while we are quite certain that all mechanisms linking recreational CES to constituents of individual wellbeing were identified (i.e. thematic saturation point is visible), it might be that not all mechanisms for collective wellbeing were identified.

Furthermore, we must emphasise that in most cases, there is no single pathway linking recreational CES to a given constituent of individual or collective wellbeing, but instead multiple mechanisms mediate such connections (Figures 4 and 5; Table S5, Supplementary Material). Although other empirical studies have alluded to this (Pedersen et al. 2019; Campagnaro et al. 2020), it was not clearly delineated in most cases but was based on reflections of the research team rather than using robust empirical approaches to map the linkages.

Despite recent conceptual advances to delineate such mechanisms (Huynh et al. 2022), we still lack empirical studies exploring how they unfold in reality, particularly for collective wellbeing. In this sense, this study provides some much-needed insights on how to establish such linkages, and how they might look like in blue spaces with recreational potential.

In addition, we observe some thematic variation across age and gender groups in how individuals relate to and benefit from blue spaces (Change in blue spaces and recreational activities). For instance, younger participants tended to emphasise satisfactive mechanisms such as enjoyment through physical and social activities, while older participants more often highlighted regenerative benefits like emotional restoration and relaxation. We also observe that references to spiritual and emotional connections were more prevalent among female participants. Although this suggests that demographic characteristics likely affect CES and human wellbeing linkages (e.g. see Bolte et al. 2019), we must emphasise that our study was not designed to systematically disentangle these connections in terms of comparative prevalence and intensity by age, gender or class, nor to conduct an intersectional analysis. At the same time, while in-depth interviews captured individual narratives, the FGDs (Mechanism linking recreational urban blue spaces with individual wellbeing-3.4) were intended to explore group views on collective wellbeing and trade-offs, rather than find intra-group differences. These patterns nonetheless point to the value of future research that engages more explicitly with intersectional perspectives.

Finally, we must note the general lack of empirical evidence on how recreational interactions with Nature contribute to wellbeing in developing countries of South and Southeast Asia. An emerging body of knowledge from Indonesia (Vollmer et al. 2015; Rahman et al. 2025), the Philippines (Lagbas 2019), India (Sen and Guchhait 2021; Thapa et al. 2024), Malaysia (Lourdes et al. 2024) and the broader region (Quevedo and Kohsaka, 2024; Wolff et al. 2025) highlights the potential of urban Nature to contribute positively to individual and collective wellbeing through recreation, learning and social cohesion, among other. However, most of this research has focused on single or small subsets of human wellbeing dimension and usually does not focus on blue spaces and/or rapidly changing coastal areas. Our findings from Danang bridge some of these gaps in this emerging literature by providing empirical evidence from a coastal context, illustrating the diverse mechanisms through which urban blue spaces support both individual and collective wellbeing in the face of rapid urbanisation and environmental change.

4.2 Unpacking trade-offs and synergies between individual and collective wellbeing

We identified multiple synergies and trade-offs between constituents of individual and collective wellbeing (Linkages of recreational ces with collective wellbeing, Figure 6). Examples of synergistic effects in the literature include (a) urban foraging activities in urban green spaces that simultaneously contribute to mental health, cultural tradition and ecological knowledge (Palliwoda et al. 2017) and (b) visits to urban parks and wetlands that simultaneously generate a sense of refuge, place attachment, and mental and physical health benefits (Sonti et al. 2020). Conversely, examples of negative trade-offs include (a) gains in mental health and leisure fulfilment but reduction in place attachment when transforming urban Nature without considering meanings of the places (Stedman 2003) and (b) gains in economic wellbeing but loss of spiritual and intrinsic values (Aulet and Duda 2020).

Notably, here we identify trade-offs and synergies between constituents of individual and collective wellbeing, which have been very rarely explored in the literature. A synergy example is between individual learning and capability (e.g. recreation CES equip people with ecological knowledge) to collective actions (e.g. working together to protect environment). However, the participants mostly identified trade-offs in that positive effects to individual wellbeing via recreational CES do not necessarily lead to positive collective wellbeing outcomes (and vice versa). In simple words, many respondents alluded that ‘being well’ as an individual may not necessarily translate in ‘being well together’. Figure 6 visualises such an example in that tourism revenue can enhance economic wellbeing for some individuals but in the long run can create income inequality and injustice at the community level. Furthermore, changes in beach use for instrumental values that increase the recreational experiences of individuals can result in the loss of culture, community identity, collective actions and a sense of communion. This further points to that collective wellbeing which is not simply an aggregate of individual wellbeing (Bentley Brymer et al. 2020), and that we must capture the more-than-individual value embedded in the way people interact in the community (Atkinson et al. 2020).

Looking more critically, these findings point to the existence of certain societal and cultural aspects mediating the relationship between individual and collective wellbeing (whether through trade-offs or synergies). This flags the importance of ‘relational’ values such as social connectedness, reciprocity, equity and trust, social cohesion and integration, emphasised by IPBES work when delineating interactions between people and Nature and among individuals within social groups (IPBES 2019). Bringing 'relationality' when identifying and assessing individual and collective wellbeing outcomes can help recognise underlying socio-cultural aspects and processes that may have been overlooked (Atkinson et al. 2020).

When looking at our results through this lens, relationality should arguably go beyond social relations and interactions between people and Nature, to conceptualise multiple other relationalities with places, structures, other tangible and intangible aspects of urban life. Although here we focused on individual and collective wellbeing, future research on relational collective wellbeing can prompt greater awareness in operationalising the more comprehensive concept of 'community' and what it means to wellbeing.

While our findings highlight trade-offs and synergies in how urban blue spaces contribute to the local community members (i.e. which human wellbeing constituents are affected), we acknowledge that this study was not designed to formally analyse distributive justice or equity. The trade-offs identified here are experiential and relational, reflecting participants' subjective accounts on their own wellbeing (i.e. trade-offs between constituents of wellbeing) rather than systematically capturing and analysing effects across different socioeconomic segments (i.e. who benefits or loses from beach transformation). Although concerns about distributive justice of unequal access and economic disparities (particularly in relation to tourism-driven coastal changes) emerged in respondents' narratives, a comprehensive assessment of who benefits or loses from such transformations would require a different methodological approach that is beyond the scope of this study. This points to important directions for future research that integrates power dynamics and environmental justice frameworks in the context of rapidly transforming urban blue spaces to complement the relational and wellbeing-oriented approach adopted here.

4.3 Implications for research, policy and practice

Below we discuss the main methodological, conceptual, empirical and practical implications of our research, mindful, however, of the thematic scope, geographical focus, and methodological challenges and limitations (for details see Data collection and Box S1, Supplementary Material).

Methodologically and conceptually, the multi-stage methodology used in this study combined in-depth individual interviews with deliberative FGDs. Engaging the same participants and 'requesting' to deliberately frame their answers as individuals in the former case and as members of the local community in the latter case enabled the elicitation of different values about the linkages between non-material benefits of Nature and human wellbeing. Our observations of the group dynamics during the deliberative component suggest that this approach also contributed to knowledge sharing (Grainger and Stoeckl 2019), knowledge co-creation (Reed 2008), and social learning and awareness-raising (Grainger and Stoeckl 2019). We believe that such approaches hold potential and should be explored in more depth when establishing the multiple contributions of Nature and their linkages to human wellbeing. Of course, the actual framing and methodological decisions of such elicitation exercises should be guided by the ecological, cultural, socioeconomic and institutional context of each study.

Empirically, our findings suggest that processes at the interface of tourism and urbanisation can cause important changes in urban blue spaces, with knock-on effects on recreational benefits and ultimately human wellbeing (both positively and negatively). Positive effects can materialise through the increased provision and improved quality of recreation-based CES via tourism investments, infrastructure development and improved landscape/urban design. Negative effects can materialise through the degradation of such CES due to water quality degradation, ill-planned coastlines and biodiversity loss (Berdalet et al. 2016), or loss of access due to privatisation of public spaces (Low 2006).

In such context, we underscore the importance of a multi-scale wellbeing assessment of local residents to inform urban and tourism management. Understanding how different dimensions of human wellbeing are influenced by recreational and tourism services underscores what truly matters to people. It serves as a reminder to policymakers that tourism-oriented urban landscapes serve not only tourism purposes but also cater to culture, spirituality, education and places for fostering attachment and a sense of belonging for both locals and tourists. Incorporating the wellbeing assessment of locals in tourism management is advantageous in identifying multiple objectives and recognising the policy instruments that could yield positive wellbeing outcomes for urban dwellers, rather than focusing solely on economic benefits from tourism revenue. For instance, understanding the mechanisms that mediate the linkages between recreation from urban green/blue spaces to individual and collective wellbeing constituents (e.g. regenerative, cohesive and satisfactive) could enable the support of mechanisms likely to bring synergistic positive effects. At the same time, it could help reduce mechanisms associated with trade-offs and negative outcomes (e.g. destructive) as much as possible.

Practically, this could involve implementing policies that encourage recreational activities known to boost regenerative, cohesive and satisfactive mechanisms. This might include the development of community programmes, the preservation of cultural and spiritual sites, and the promotion of educational initiatives within these spaces. Simultaneously, efforts should be made to mitigate destructive mechanisms. This could involve stricter environmental regulations, careful urban planning to prevent overcrowding and measures to ensure equitable public access to these spaces. A nuanced understanding of the complex interplay between recreational services and wellbeing constituents can guide more holistic and effective urban and tourism management strategies. By prioritising multi-dimensional wellbeing outcomes over mere economic gains, we can create urban landscapes that truly serve their communities, fostering a sense of belonging, promoting wellbeing and enhancing the overall quality of life for all residents.

5. Conclusions

This study unravelled the links between non-material benefits of Nature (conceptualised as CES) and individual and collective wellbeing through the lived experiences of local community members. We focused on recreational CES from urban blue spaces in Danang (Vietnam). Methodologically and conceptually, the multi-scale approach used here 'requested' participants to frame their answers both as individuals (during individual interviews) and as members of the local community (during FGDs).

Overall, we find multiple linkages between CES and individual/collective wellbeing, with distinct pathways, trade-offs and synergies emerging due to blue space change in this highly urbanised and rapidly transforming geographical context. Approaches that put participants in different roles hold substantial potential for establishing the multiple contributions of Nature and its linkages to human wellbeing.

Notes

1. There is a long history of debates on defining 'community'. A conventional distinction is between 'community of residence' and 'community of shared interests/values', pointing to different notions of the term (Lee et al. 2015).
2. The Son Tra Goddess is believed to hold Danang's spiritual life and protect the safety of lives at sea and from sea-related disasters.

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Author contributions

L.H., A.G. and K.F. conceived the ideas and designed methodology. L.H. collected the data. L.H, A.G. and H.I. analyse the data. L.H. and X. T. T. created figures and tables. L.H. and A.G. led the writing of the manuscript. All authors contributed critically to the drafts and gave final approval for publication.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

Data collected for this study is mainly qualitative data, namely recording interviews and workshops. The data that support the findings of this study are available from the corresponding author upon request.

Declaration of generative ai in scientific writing

The authors did not use generative AI in writing this article.

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