An Exploration of the Contribution of Embodied, Situated Research Strategies to Cultural Ecosystem Services and Landscape Assessment Frameworks: An Environmental Empathy Case Study

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Abstract

Since the Millennium Ecosystem Assessment in 2005, interest has increased in cultural ecosystem services (CESs) research to understand the complexity of the non-material benefits that people obtain from ecosystems. The intangible and interactive characteristics of CESs present many challenges regarding how to approach, quantify and even define CESs. In this paper, we suggest looking at CESs through the lens of embodied and situated cognition theories. We advocate that such an approach should be applied to the development stage of CES research projects, as the embodied and situated experience of the site aids the development of research questions and future interventions. We described a case study—namely, the Environmental Empathy Research Challenge, which took place during the ColLaboratoire 2020 Research Residency in the Philippines. This case shows how interactive, embodied and situated workshops, such as *Embodied Empathy* and *Walking Maps*, contributed to developing a research proposal and a novel research framework, *ecological embodied cognition (EEC)*. EEC focuses on the concept of *environmental empathy* to redefine the human-environment relationship. Further, based on an example of a participatory research activity, *Sensing-Playing-Moving*, we examined how interventions founded upon EEC principles enhance environmental empathy.

Keywords: environmental empathy; embodied cognition; situated cognition; CES; landscape; participatory research

1. Introduction

The Millennium Ecosystem Assessment (MEA, 2005), initiated by the United Nations, assessed the wide range of consequences of ecosystem change for human well-being and the need to enhance the conservation and sustainable use of those systems and their contribution to future generations well-being. The report confirmed that people had changed ecosystems more rapidly and extensively over the past 50 years than in any other time in human history. These changes are substantial and cause largely irreversible losses to the diversity of life on Earth.

The MEA was the first attempt of its scale to evaluate ecosystems and their services, defined as the benefits that people obtain from ecosystems. It distinguished four broad ca-tegories of ecosystem services: regulating services, such as climate regulation, water purification or pollination; provisioning services, such as food production, drinking water, timber and natural gas; supporting services, such as nutrient cycles and oxygen production; and cultural services, such as spiritual and recreational benefits.

The main finding of the MEA was that human actions are depleting Earth's natural capital, thus endangering the sustainability of ecosystems for future generations. This trend can still be reversed through the sustainable management of ecosystems if the right poli-cies are introduced. By examining the human-environment relation through the lens of ecosystem services, it has become more apparent how ecosystem changes influence people's well-being and developmental needs, alongside complementary social and economic information (ibid).

In particular, the MEA (2005) started a broader discussion and in-depth research on cultural ecosystem services (CESs), which, although included in some previous qualifications (Costanza et al., 1997; de Groot et al., 2002), suffered from poor quantification and integration in management plans (Milcu et al., 2013). In MEA (2005), CESs are defined as "the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences". These benefits were shown to directly influence people's quality of life, identity and well-being, yet they have gained little recognition in more economically and ecologically oriented environmental decision-making models (Chan et al., 2012). As CESs are intangible by definition, they are difficult to research, quantify and measure. Commonly, their va-lues depend on subjective, individual and cultural assessments of their contributions to people's well-being. These benefits are often subtle yet intuitive, such as a forest's provision of recreative and calming spaces (Milcu et al., 2013).

There are various approaches to understanding the human-environment relationship in the context of CESs. In this paper, we introduce the most influential frameworks that represent methodological shifts in CES valuations from early taxonomic approaches to a more interactive, complex system of CES benefits co-production, into embodied perspective on CESs. This introduction will be followed by a case study of the Environmental Empathy project, which shows how taking an embodied and situated perspective seriously shaped all stages of a CES's assessment, from the planning stage to the develop-ment of research questions and methods for gathering data in future interventions.

2. Cultural Ecosystem Services Valuation

The ecosystem services framework provides tools for economic valuations of ecosystems, bridging ecological and economic discourse in environmental studies (Turner & Daily, 2008). As presented in the MEA, this framework has been proven useful for planning and management, as it enables some of an ecosystem's values to be expressed as metrics that can be understood by the public (monetary values) and policymakers in decision contexts.

However, cultural services are usually poorly represented in such analyses, as they are difficult to quantify (de Groot et al., 2010). Chan et al. (2012) suggested shifting the understanding of CESs from purely economic valuations to social valuations, defining CESs as ecosystems' contributions to the non-material benefits (e.g. capabilities and experiences) that arise from human-ecosystem relationships. This model presents a comprehensive but not exhaustive taxonomy of the dimensions of values, striving to offer an appropriate consideration of various relevant values associated with ecosystems and environmental management. Although Chan et al.'s (2012) model is rather descriptive, it acknowledges that many ecosystem services (co-)produce 'cultural' benefits; hence, a full characterisation of services would benefit from addressing non-material values through social sciences-based approaches.

Using a complex systems approach, Fish et al. (2016) developed a conceptual framework for understanding CESs and the benefits associated with them in terms of the environmental spaces and cultural practices that arise from interactions between humans and ecosystems. This model emphasises that a place, locality and landscape characteristics are as important to the emergence of cultural goods and benefits as the cultural and social practices that take place in the location are. Hence, it offers a framework for integra-ting environmental and social aspects to CES valuation.

Figure 1 illustrates the complex relationships between different cultural and environmental framework components that influence and are shaped by CESs and their benefits. The benefits of CESs have an emergent character, meaning

they cannot be derived from or predicted by the separate elements of the relational system based on the individual characteristics of space or people. Instead, they appear from dynamic interactions. As a consequence, research into CESs needs to employ methodologies that can capture the interactions between people and spaces and the emergent effects of such interactions.

Similarly, people's experiences, perceptions and senses of place are emphasised in Nature England's Landscape Character Assessment (LCA) framework (Tudor, 2014). Within this framework, people and places are crucial to the definition of the term 'landscape' (Figure 2). Further, the European Landscape Convention defines a landscape as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (European Landscape Convention, 2000). Similarly, Fish et al. (2016) emphasise that social and cultural values are embedded in the environment. Additionally,
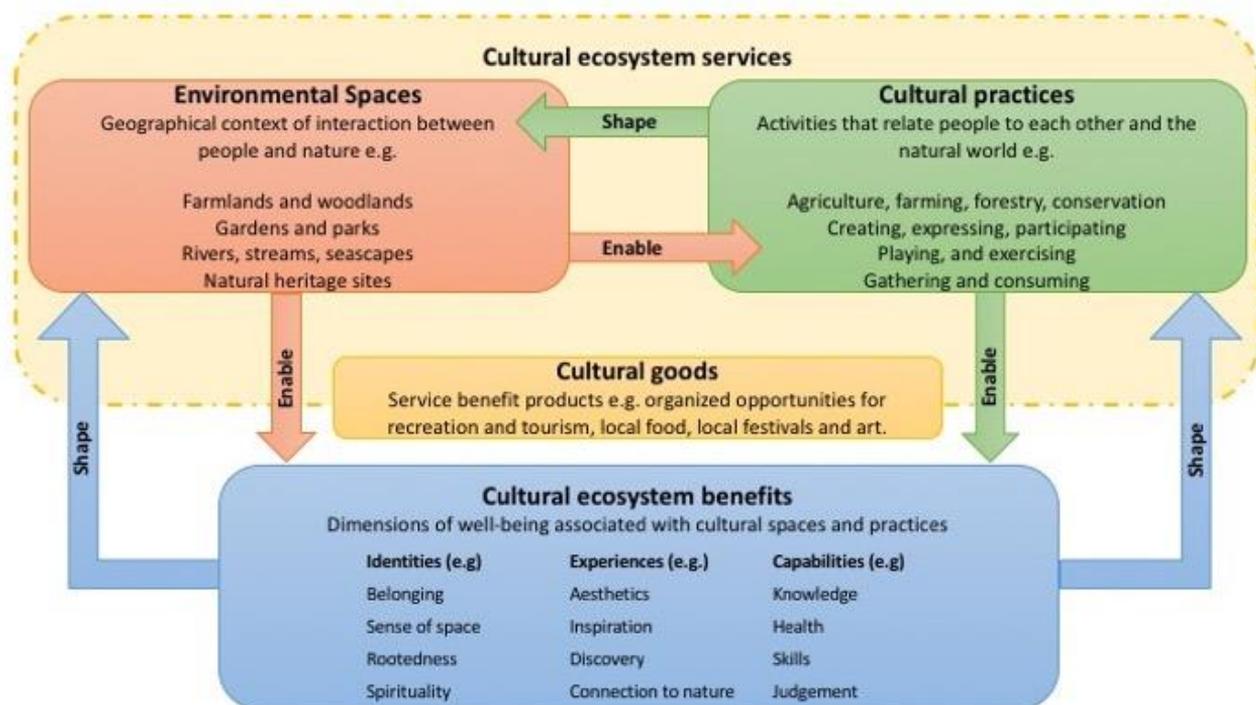

Figure 1. Cultural ecosystem services framework (adapted from the UK National Ecosystem Assessment follow-on CES framework in Church et al. [2014]).

Understanding human behaviour in the wider, environmental context is a broad interest of embodied, situated theories of cognition. These theories advocate studying people's relationships with real, physical environments rather than collecting declarative statements or staying in laboratories. From the start, they define problems in terms of dynamic systems of interrelated factors rather than cause-effect schematic relationships. While there are various philosophical, phenomenological and psychological versions of embodied cognition theories, they all share a strong interest in embodiment, acknow-ledging the role of the body and its interactions with the environment in humans' perceptions, emotions and cognition.
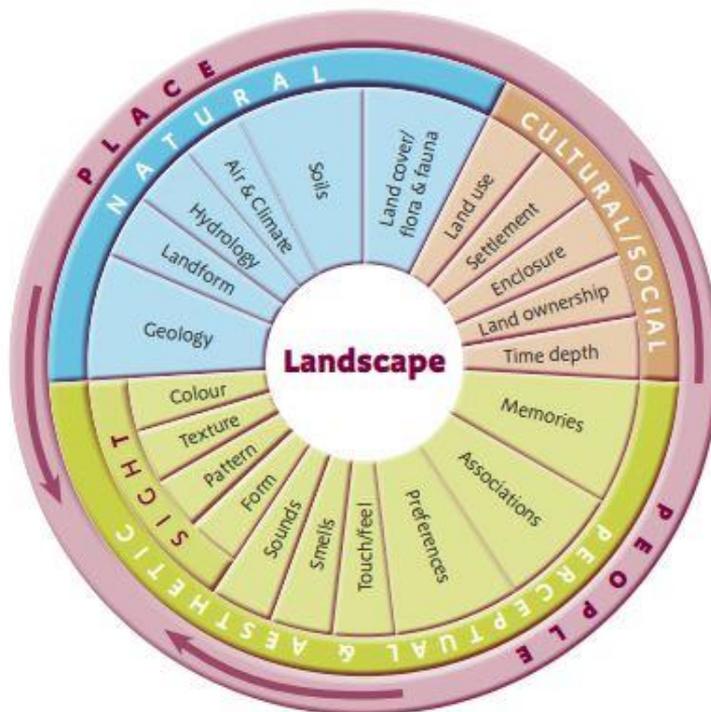
Figure 2. *What is Landscape?* (from Nature England's Landscape Character Assessment [LCA] framework, Tudor, 2014).

Raymond et al. (2018) take an embodied perspective on CESs in their model of *Embodied Ecosystems*. Building upon affordance theory (Chemero, 2011; Gibson, 1979), they suggested that human-environment connections and, consequently, CESs' benefits are created through a network of relations between environment, culture, body and mind. They further suggest that such a web of relations is 'actualised' through real-time interactions with a place.

Gibson coined the term *affordances* to describe what the environment affords a person, depending on the properties of the environment and the observer (Gibson, 1979, p. 127). This term implies the complementarity of the person and the environment but cuts across the dichotomy of subjective-objective property (Gibson, 1986, p. 129). Affordance is a functional property, meaning it does not rely solely on the physical characteristics of an environment, as a meadow would suggest a good place for a Sunday picnic. Similarly, it does not rely solely on the abilities of a person, such as the abilities to prepare picnic food or walk to the meadow. An affordance perspective emphasises the relational cha-racter of people's interactions with environments by which opportunities for and constraints preventing actions are directly perceived (Chemero, 2011).

Adopting embodied cognition to the understanding of CESs implies moving from the co-production of the CESs framework to the framework of *embodied ecosystems* (Raymond et al., 2018). This approach emphasises that embodied ecosystems are *relational* – that is, they comprise a web of relations between environment, culture, body and mind (as opposed to relying on any of these aspects alone). A hiking trail might be perceived as too challenging for one person to enjoy and too easy for another person, depending on their fitness levels. Moreover, embodied ecosystems are *situational* and actualised by direct perception processes in real-time. Therefore, a trial that could be climbable on one day might be beyond the same person's abilities in bad weather or if their health is poor. Finally, embodied ecosystems are *dynamical*, meaning they continually change, as do the value they provide, depending on a person's actions, experiences and skills. In this context, the benefits of CESs can be understood as the perceived affordances provided by environmental spaces in the context of cultural practices and individuals' abilities and experiences.

From a social perspective, each environmental setting consists of multiple nested yet independent sets of affordances that shape human (and non-human) behaviour (Heft, 2001). Barker (1968) showed that people's actions are more consistent with their *behavioural setting* than their individual or social characteristics. In other words, the place and time (e.g. a particular time of the day) regulate how people interact with their space and each other. For example, while hiking in nature, people commonly greet each other or even engage in small talk, but while passing each other on the street of a big city, they rarely even make eye contact. In this context, cultural practices are deeply embedded in the environmental settings provided by a place.

Moreover, they are socially constructed, and their maintenance is *socially distributed* (Hutchins, 1995) among the community. This means that each community member has some concept of the practice and support an activity at least by adequately responding to others (e.g. answering greetings while passing someone on a footpath). However, the knowledge about practices might be distributed between community members without a clear idea of what to do. Each person is guided by others (socially), space affordances (settings' opportunities

and constraints) and their own participation in them. They also contribute to and help maintain ongoing cultural practices.

3. Empathy

Social collaboration would not be possible without empathy (Gallese, 2003). From the perspective of embodied cognition, empathy is seen as a social glue, the ability to perceive the state of others through the embodied experience of oneself and one's innate abilities to reflect the behaviour (especially such aspects as bereaving patterns of facial expression) of our partners during interactions (Niedenthal et al., 2005). Although empathy is generally understood today as the ability to understand (or sense) the emotions of others (ibid.), the word originates from the term *einfühlung* (in-feeling), which conveys the idea of *a projection of human feelings into the natural [or physical] world* (Vischer, 1873 as cited in Guergachi et al., 2010). Based on its original meaning, empathy was central to aesthetic appreciation studies and understood as a kinaesthetic, imaginative entry to works of art, such as paintings, poetry, or modern dance. It was based on not only the nature of the artwork itself but also the act of perception and what it *signified* for a person from some point of view (Lanzoni, 2018). Later, Lipps (1903, as cited in Jahoda, 2005) extended empathy's application to the issue of how we get to know others, describing it as the primary source of our knowledge of other people's experiences.

In recent years, empathy was identified as a critical factor for conservation and sustainability efforts (Brown et al., 2019; Guergachi et al., 2010). Empathy with nature is one's capacity to understand and share the emotional experience—particularly distress—of the natural world (Tam, 2013). Empathy and emotional engagement with nature create cultural meaning that embeds the environment and pro-environmental behaviour in one's identity and place-oriented norms. Therefore, individuals who have empathy for the environment, particularly as it relates to the consequences of environmental harm, are likely to support sustainability goals (Brown et al., 2019). Empathy is seen as a crucial factor underpinning human-environment relations and, therefore, essential for understanding the complexity of CESs.

Embodiment theories propose that sensory, somatic and motor responses are as important to understanding human behaviour in the environment as people's attitudes and norms (Niedenthal et al., 2005, Raymond et al., 2018). Therefore, research into the benefits of CESs should include embodied, physical explorations of the environmental setting. People construct their knowledge and attitudes through interactions. Therefore, to learn more about a site's importance to a community, research tools are needed to assess exploration, interaction and self-reflection on site.

Below, we discuss how the concepts and theories mentioned above inspired the research questions, tools and interventions in social-environmental studies on the social use of the landscape and benefits of CESs. We focus on developing the Environmental Empathy research challenge addressed during the ColLaboratoire 2020 Research Residency at Siargao Island in the Philippines.

4. The Environmental Empathy Case Study

4.1. ColLaboratoire Research Residency

ColLaboratoire 2020[1] was a week-long research residency program in multiple-disciplinary research on cognitive innovation and sustainability in the context of the Philippines. The programme invited early-career researchers to explore six *research challenges,* related to the United Nations (UN) Sustainable Development Goals (UN 2017), during one week on the island of Siargao, Philippines. The research teams (both invited research fellows and facilitators) were radically multiple-disciplinary to encourage imaginative and innovative approaches to the challenges. This programme built on the successful CogNovo Innovative Doctoral Programme that fosters research training in the emerging field of Cognitive Innovation (Gummerum & Denham, 2014), held at the University of Plymouth between 2014 and 2017[2].

The research residency was particularly shaped by one of the CogNovo events, the ColLaboratoire 2016 Research Summer School that advocated the project-based structure, the encouragement of social mobility, shared space, and social activities as key factors for successful multiple-disciplinary research collaborations (Torre et al., 2020). This time, the project-based structure was constructed around the research challenges that draw upon the UN Sustainable Development Goals (UN 2017) and the Filipino context. We encouraged mobility through bursaries for the Filipino and South-East Asia research fellows but did not limit participation to this region. As a result, we hosted a multicultural and multiple-disciplinary group of research fellows and facilitators that shared a common interest in pursuing research into innovation and sustainability in an unusual way. The residential setting of the programme was grounded in the previous observation that many creative and fruitful ideas and collaborations come alive in informal settings, such as while eating breakfast together. As a shared location, we chose Siargao Island, a place that offers a stimulating mix of nature preservation, rural settings and intensive tourism challenges.

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[1] ColLaboratoire 2020 Research Residency is documented at https://collaboratoire20.cognovo.org

[2] CogNovo programme was supported by the Marie Curie Initial Training Network FP7-PEOPLE-2013-ITN-604764; www.cognovo.eu

4.2. Location

Siargao Island is located in the South-Eastern part of the Filipino archipelago, at the North-eastern portion of Mindanao region. In 1996, the island was established as the Siargao Island Protected Landscape and Seascape, by virtue of Presidential Proclamation No. 902. It is one of the three priority protected areas in the Mindanao Biogeographic Zone, characterized by a unique combination of ecosystems comprising marine, wetland and terrestrial areas. It has one of the biggest mangrove areas in the world, of approximately 8,600 hectares. It is a habitat for diverse species of fauna and flora. It provides a refuge for endangered marine turtles such as the Green Sea Turtle (Chelonia mydas), Hawksbill Turtle (Eretmochelys imbricata), and Olive Ridley Turtle. It is the home of the valuable and threatened Philippine Ironwood or Mancono (Xanthosthemon Verdugonianus) which is one of the hardest known species of wood. In recent years, Siargao Island became a tourist destination, particularly due to its exceptional surfing conditions. Due to the complexity of its circumstances, Siargao was a perfect location to situate the Environmental Empathy research challenge, our case study described below.

4.3. Environmental Empathy research challenge

The starting point for the Environmental Empathy challenge was to investigate the interconnected natural, cultural, and social ecosystems of the Philippines in the *biocultural landscape framework*. Biocultural landscape is shaped by the "dynamic processes that were developed during time by nature and humans (...) connected to people by multiple interactions, forming complex biocultural systems full of function, services and values" (Pungetti and Gomez 2017). The challenge aimed to develop novel approaches, reflecting local stakeholders' values, that could be further used to underpin local economic and social development plans. The diverse group of invited research fellows was composed of a forestry advocate, an environmental ethicist, a multi-media artist, an NGO's project manager, and an environmental studies researcher. The fellows were supported by the equally diverse team of facilitators: Dr Joane Serrano (a development studies and communication specialist), Minerva Gonzales (a marine biologist, an environment and development management specialist, and a social and human rights activist), Dr Klara Łucznik (a psychologist and a dance improviser) and, remotely, by Dr John Martin (a human geographer). The group engaged with a variety of approaches to identify environmental issues in the local community through reflective, participatory research.

4.4. Ways of working

The research residency was a short-period project. Each challenge had just six days in which to agree on the common ground and develop an idea (or several ideas) as to how they want to address the challenges, as well as to conduct additional background research, and prepare a final presentation or prototype; keeping in mind that the idea has to be possible to develop further into a small research project that the group can conduct independently over the following six months, with additional funding.

A common issue of multiple-disciplinary collaborations is that each discipline uses a slightly different language to discuss problems and put distinguishing emphases on what is *an interesting question* (Torre et al., 2020). To overcome this limitation, we decided to invite research fellows to approach their research concepts in a new way, through embodied and situated experiences. We hoped that the shared experience would serve the group in a twofold way. Firstly, it would provide the participants with a felt, embodied experience, through guided physically based, interactive, creative and co-operative workshops, before they start discussing ideas. This way, they will gain a felt sense of embodied and situated approaches to understanding human behaviour. Secon-dly, we hoped the shared experience, especially creating things together, would lead to group cohesion, building trust and increasing understanding among the fellows and allowing smoother further collaborations based on group flow principles (Sawyer, 2007).

Here, we gave an overview of two initial workshops. The first workshop focused on the introduction of the concept of empathy in the context of the embodied cognition research. The second workshop, Walking Maps, aimed to engage the group with the site, through the peripatetic exploration of the Siargao seascape. Both workshops draw on participatory research principles, emphasising the collaborative nature of stating research questions, gathering and interpreting data, and knowledge-production processes (Bergold & Thomas, 2012; Breitbart, 2010).

4.5. Workshop 1: Embodied empathy

The concept of embodied empathy (Gallese, 2003) was introduced in the form of an interactive, physical workshop. We started with enhancing one's body awareness. We invited the group to participate in a shared movement improvisation practise, in which we explored the space, movement in the space and within the group, and adaptations to moving in the crowd and alone. Then we moved our focus onto the sensations of breathing, also noticing pulse and body temperature changes.

After this warm-up, we introduced a relational exercise: shaking a hand (Benjamin, 2002). We asked participants to find a partner, face each other and

simply shake hands. After repeating it a few times, they tried it with eyes closed. In the next stage, they were invited to develop this simple, culturally embedded action into a bigger movement improvisation exploration, while also attempting to return to their original partners (with eyes closed) and rest in the act of a handshake. Later, the improvisation was further opened into a free exploration of the space (still with closed eyes), exchanging handshakes with other participants, and occasionally (by chance) coming back to their primary partner. This exploration allows people to notice and experience how much knowledge is contained in touch sensations. Even after a long exploration, people immediately know when they come back to the same partner (especially the primary one), and gather multiple clues about the character and preferences of people they meet.

The third part focused on a mirroring exercise (Rothschild, 2006). In pairs, one person was asked to think of a situation with some emotional charge, to take a physical posture that has something to do with this situation, and maintain it. Once ready, their partner mirrored (copied) the posture, getting into the exact same position. Then the mirroring partner reflected (writing on paper) on the various aspects of their experience: which muscles were engaged, the sensations that came to awareness, the images, thoughts and feelings that came to mind, including the guess on what situation could be represented. In the end, the pair compared the original memory with the copied one. Commonly, participants notice how much information they can extract from careful observation of others, and then how precise their insights are once they embody their partner's posture.

4.6. Workshop 2: Walking Maps

This workshop used peripatetic methods to shed light on the interaction between participants, their embodied and mental reality, and the environment. Walking was used here both as a tool to facilitate an interactive approach to the surroundings expanding beyond mere verbal description or viewed images - and as a metaphor calling for discursive and narrative reflection on the shared questions. The Walking Maps workshop originates from the GCRF Coral Communities project, My Cult-Rural Toolkit[3](Martin et al., 2021), the collection of techniques for participatory community research into the values and use of landscapes.

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[3] My Cult-Rural Toolkit is available at: , https://www.ruritage-ecosystem.eu/culttool (accessed 6th of September 2020). It was design through the Global Challenges Research Fund *Coral Communities* held by the University of Plymouth. Currently, the project is further developed as a part of the European project *RURITAGE: Rural regeneration through systemic heritage-led strategies*.

For this workshop, the group was invited to take a walk around the chosen coastal area of Siargao Island and collect some materials - objects that caught their eye on the way. Fellows were asked open questions at key intervals. They recorded their answers in relation to location and collected objects. Once the group completed the walk, they created an exhibition containing the objects, fellows' responses and the trace of their trail.

Each group concluded their exploration by a presentation of their small exhibition (Fi-gure 3). It evoked further discussion on the value of landscape and the way that they (or others) interact with the site.

a   *b*

Figure 3. Walking Maps – this participatory research methodology invites
participants to explore their landscape and collect some related object (a)
in order to create an exhibition that describe their view of the landscape (b).

4.7. Edge of Chaos

The workshops allowed the group to gain a new embodied and situated perspective on their research topic. Each shared physical activity would open rich interdisciplinary discussions on the main research topic and on research methodologies that could be later applied. They also prompted a series of other site-specific interventions and enquiries, such as nature poetry, and movement sessions, held at the outdoor locations on most days of the project. Throughout the week, the group elaborated upon the research topics applying multiple creative strategies, such as brainstorming, design thinking and research frameworks. They summarised their approach as *the edge of chaos* methodology (Figure 4).

**Figure 4. The Edge of Chaos – a diagram of a multiple-disciplinary approach
to the Environmental Empathy research challenge.**

All these techniques contributed to the understanding of each other's method-
ological stance and the development of a shared research language that the
group used to address their research challenge. The experiential, situated
workshops, alongside the field trip, visiting protected mangrove areas, gave the
group the critical element of shared, felt experiences that allowed them to con-
stitute their project in a way that was focused, yet multiple-disciplinary, and
open for varied layers of gathering data and produ-cing outcomes.

4.8. Ecological Embodied Cognition framework for understanding Environ-mental Empathy

As a result, the research fellows developed a novel framework to refer to their
experiences and for facilitating the development of future interventions. Here
is an excerpt from the final presentation, that shed light on how the experien-
tial workshops shifted the group understanding of the problem and promised
some novel approaches to address the challenges:

To place our project in context, we highlighted that the most recent UN report on biodiversity states that the current rapid decline in biodiversity and ecosystems will undermine progress of 80% of the Sustainable Development Goals (UN, 2019). 'Transformative change' is thus imperative, not only of technological and economic factors but 'including paradigms, goals and values '(ibid.). We therefore introduced the concept of environmental empathy as a potentially key component of this paradigm shift. Empathy consists of the ability to recognise the internal state of others via communicative cues (relational element), an ability to take over the perspective of another (cognitive element) and the sharing of internal or emotional states (affective element). It is subsequently considered a core ability of the human social animal (Derntl & Regenbogen, 2014). Extrapolating such research to include more-than-human relations, we therefore drew on literature which redefined the human as an ecosocial animal with life on earth as inherently capable of perception, intention and communication; a world alive, 'a world astir with responsive presences that vastly exceed the human'(Mathwes, 1997). Using the term **'Ecological Embodied Cognition'** *to understand the human as embedded in the body and at home in the world, our core research question was outlined as:*

How do interventions founded upon ecological embodied cognition (EEC) enhance environmental empathy?

The EEC approach emphasises the interconnectedness of the mind and body, as well as focuses on relationships with the environment and more-than-human world. Similarly to a phenomenologist and ecologist Abram (2010), this approach puts in its centre the felt, sensual experience of being in the world. Empathy is considered here as *more-than-social glue*, that allows people to develop a meaningful relationship with the environment. Attention towards an empathic relationship with one's surroundings allows *new affordances* to be discovered and explored as, by practicing such a way of relating, our perceptions tune deeper into the more-than-human. The ecological aspect of EEC emphasises that our behaviour, attitudes and identities are situated in a broader ecological context. Therefore, it postulates a missing link between embodied cognition theories and such frameworks as Church et al.'s (2014) CESs or LCA (NE 2014), that approach the human-landscape interaction from the high-level ecosystems perspective.

To put the EEC approach in practice, the group decided to develop and examine nature-inspired activities and interventions that integrate the EEC's principles: a person understood as an embodied being, situated in the wider environment, an activity that develop the empathic relationship with more-than-human. They considered the wide range of interventions, such as site-specific poetry, storytelling, role-playing, and mindful exercises, in cultivating a more holistic

empathy (i.e. cognitive, affective, and somatic) for and with the environment. The result of this exploration is described below.
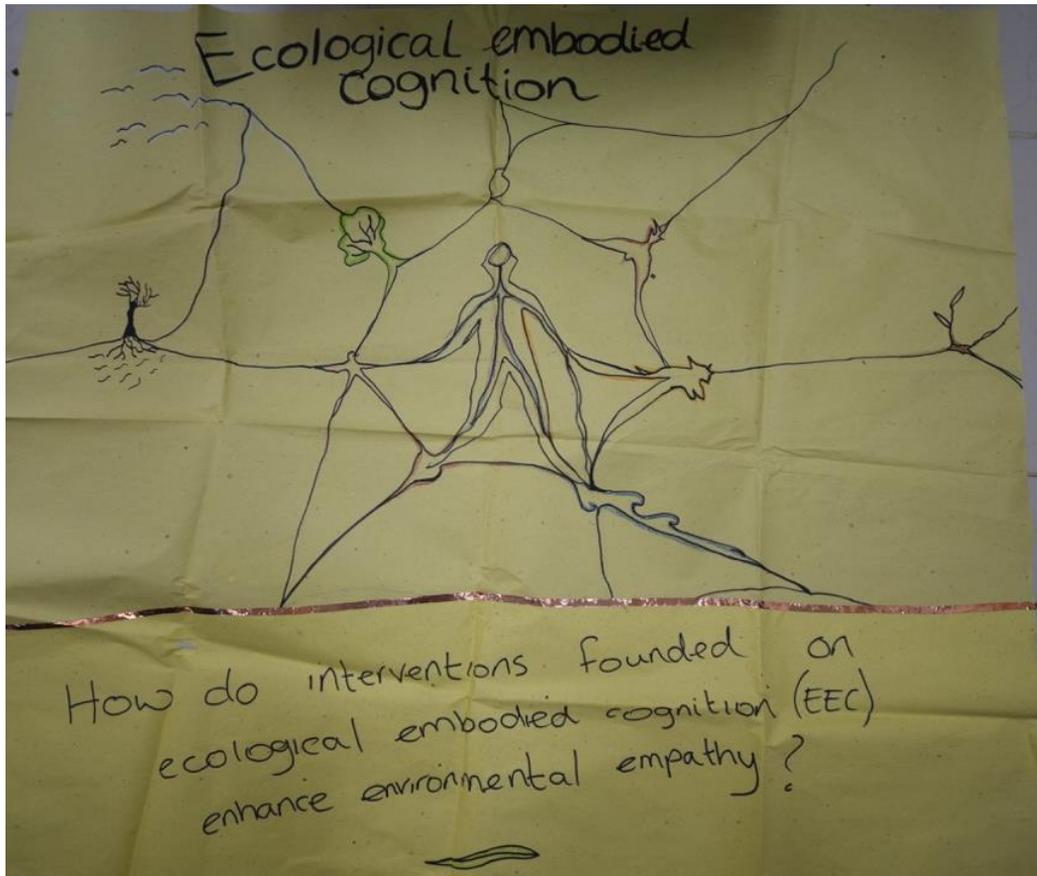

Figure 5. Ecological embodied cognition – visual representation of the EEC framework developed by the group

4.9. Sensing-Playing-Making

As a summary of the week-long research residency, the group conducted a prototypical activity called 'Sensing Playing Making', that aimed to creatively emphasize the relationa-lities between human and non-human, including bodily relations and their role in the empathic connection. First, the participants were asked to attentively notice how they perceive the surrounding with all their senses, and what bodily sensations they notice once merged with the more-

than-human. Then, they were asked to form a creative response to these sensations in any chose genre, i.e., through movement, poetry, sounding, singing, drawing, designing, or building concepts (Figure 6).

This short experience, together with the introduction to the environmental empathy concept, served both as an intervention - allowing the wider group of participants (mostly other members of the research residency) to connect in a new way with the surrounding environment - as well as an embodied illustration of the concept that is not only mentally understood but also somatically felt.

Figure 6. The Sensing Playing Making intervention resulted in many varied ways of engaging with the place. Here, body painting in response to trees, and dance inspired by nature sounds: wind, rattling leaves, birds, and sea.

The success of this intervention was simply assessed based on the participants' engagement. In response to this rather loose task, we observed a wide variety of responses and general enthusiasm. The felt, sensual relationship with the site was commonly reported, showing the usefulness of the concept of environmental empathy when discussing the human relationship with the surroundings. Participants reported noticing more details than usual (such as the range of birdsong, sounds of the ocean, and the variety of trees and leaves), even though they were already familiar with the site. They shared their appreciation for these discoveries.

4.10. Discussion

The case study described above illustrates how embodied, situated approaches to research feed into the research process, from elaborating ideas, finding research questions and adequate methodologies, to designing a research project and applied interventions. In the following discussion we summarise the key elements of the project's success and relate them to the wider context of social, environmental research.

5. Embodied, situated research

The current approaches to studying human interaction with the environment, such as the Cultural Ecosystem Services framework (Church et al. 2014), the Landscape Character Assessment (Tudor, 2014), or embodied ecosystems (Raymond et al. 2018), acknowledge the emergent character of this interaction where both human behaviour and the landscape are shaped (and reinforced) by each other. In this paper, we argue that we should have in mind this interactive (and situated) property of the problem already on the stage of planning and developing research questions.

CESs research is often interdisciplinary and bridges gaps between different acade-mic disciplines and communities (Milcu et al., 2013). Based on our experience with developing the Environmental Empathy Research Challenge, we suggest that embodied and situated engagement with a research topic facilitates the process of multiple-disciplinary collaboration by establishing a common language and experiential base for further discussions. Through the Embodied Empathy and Walking Maps workshops, the fellows (and facilitators) gained a deeper understanding of the research topic. In particular, a felt experience of Siargao's seascape and the embodied aspects of empathy. These experien-ces focused the further development of the research challenge into a participatory, embodied and situated intervention.

6. Ecological Embodied Cognition (EEC)

The EEC approach advocates for embodied, situated research into the human-environment relationship. This approach resonates with a wider trend in social psychology stu-dies that extends the current theories by incorporating the body (and embodied cognition effects) and the broader contexts, such as situational settings (Meagher, 2020). Such methodological shift is also advocated in environmental studies (Raymond et al. 2018). The idea of EEC has a preliminary character and needs further development in terms of defining both the understanding of embodiment and the ecological settings. Yet, it provides a useful reference for thinking about human relationships with environment.

Environmental empathy, in particular empathic abilities towards nature (Tam, 2013), are at the centre of this approach. We argue that the complexity of human-environment interaction cannot be fully understood without accounting the emotional dimension of one's experience. As we showed above, conceptual boundaries of empathy shifted with the development of psychology and philosophy, acknowledging again people's ability for empathising with non-human. In recent environmental studies analysis, empathy towards nature was identified as a key predictor for conservation and sustainability behaviours (Brown et al., 2019). The EEC framework provides a useful reference for how to construct a successful empathy-based intervention, by acknowledging the importance of consciously including active, embodied exploration in and of the site of interest. Further, it offers a systematic approach to investigate the efficiency of such interventions, through addressing personal experiences (by focusing on perceptual and felt sensations), social values (by looking into social interactions), and situated values (as the research process take place at the site of interest).

7. Participatory research

Active participation was an important principle for the Environmental Empathy Research Challenge. It appeared on two levels, while developing the project and in planning the final intervention (data collection). Within the research challenge group, participation referred to applying methodologies of research and gathering knowledge that would allow all the fellows to contribute and share their disciplinary expertise while benefiting from other people's skills. The group ensure active participation though *edge of chaos* methodologies, bringing empathy, openness and support into their research process. These principles of openness and shared creation were included in the workshops and *Sensing-Playing-Making* final activity.

The Walking Map workshop (Martin et al., 2021) is a valuable example of a participatory research workshopping technique. A facilitator here gives only a general framework for the activity, namely: suggesting a shared walk, prompting some general questions and organising the final workshop exhibition. The main activities - an interaction with landscape, gathering physical data (objects), and making sense of them through an exhibition - are achieved collaboratively by participants. The peripatetic character of this workshop - walking across the land - seems to support two objectives of the activity. Firstly, it engages participants with the landscape in an embodied and situated way, following the principles of EEC research. Secondly, following the observation of Anderson (2004), walking provides a natural structure for personal and shared reflections on the surroundings, giving a potential to generate a collage of collaborative knowledge.

8. Future projects

We are looking forward to the development of the EEC framework and EEC-based interventions. At this stage, we see the importance of implementing a bigger scale EEC-based intervention that can be systematically researched and further inform the theory. Such an intervention should follow the same main principles as the above case study: be experiential (embodied), situated in the site of interest, and built around and through active participation. Then, the evaluation process should utilise both qualitative evidence, building upon the rich tradition of phenomenological studies of human experience, and quantitative – a more typical approach for sociological research.

9. Summary

The Environmental Empathy case study presented above, illustrates the embodied and situated approach to the development of the CESs and landscape research projects. In particular, it shows the benefits of the participatory work-shopping techniques for multiple-disciplinary collaborations. Moreover, the ecological embodied cognition framework, and the concept of environmental empathy, were found to be useful for understanding the human-environment interaction and to integrating high-level ecosystem perspectives, such as CESs and LCAs, with social and cognitive theories of human behaviour and attitudes. We hope to systematically test this approach in our future projects.

Acknowledgements

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