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Author(s): Raatikainen, Kaisa J.; Juhola, Katja; Huhmarniemi, Maria; Peña-Lagos, Hugo

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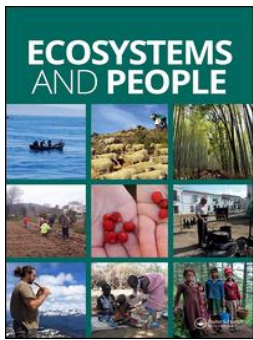
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“Face the cow”: reconnecting to nature and increasing capacities for pro-environmental agency

Kaisa J. Raatikainen^{a,b}, Katja Juhola^c, Maria Huhmarniemi^d and Hugo Peña-Lagos^e

^aDepartment of Biological and Environmental Science, School of Resource Wisdom, University of Jyväskylä, Jyväskylä, Finland;

^bDepartment of Geography and Geology, Geography Section, University of Turku, Turku, Finland; ^cMustio, Finland; ^dFaculty of Art and Design, University of Lapland, Rovaniemi, Finland; ^eBerlin, Germany

ABSTRACT

Arts-based practices can support sustainability, combined with research that points out needs for intervention. We practiced environmental sensitivity and dialogic art with fifth-grade school pupils as part of an International Socially Engaged Art Symposium (ISEAS2019). Using arts-based action research methodology, our case study focused on the opportunities of arts-based environmental education in advancing the management of meadows and wood-pastures. We explored nature connectedness and pro-environmental mindsets and behaviors among the pupils and artists/researchers. The artistic results encompassed the dialogic interactions of the intervention, exhibited artworks, and audiovisual documentation. Using the leverage points framework, we detected key levers in conservation of meadows and wood-pastures, based on literature and the current study through a content analysis on the collected reflective materials. The participants emphasized engaging with agricultural nature in multiple ways, through doing and feeling. Arts-based practices allowed participants to recognize their corporality and develop an experiential, expressive, and informed connection with nature. Based on discussions on the general ideologies and values underlying the intervention, we conclude that promoting a stewardship philosophy towards agricultural nature would benefit its conservation. Arts-based environmental education has great potential in advancing such transition, if the multidimensionality of the interaction between people and nature is acknowledged.

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1. Introduction


Through habitat destruction, agriculture is the single most effective driver of the ongoing sixth mass extinction of species (Pimm et al. 1995; IPBES 2019). Industrialized agriculture also distances people from nature by dislocating food production from food consumption (IPBES 2019). To support the trajectories of ecological and social change that can foster a more sustainable future for species, ecosystems, and society, a holistic system approach is needed (Riechers et al. *forthcoming*).

Leverage points are places within a complex system where a small shift in one thing can initiate larger cumulative changes (Meadows 1999). There are different kinds of leverage points: they range from shallow and easily accessible ones that cause only small changes, to deep points, which are highly influential and more difficult to intervene, but likely to yield truly transformative change (Meadows 1999; Abson et al. 2017; Fischer and Riechers 2019; Riechers et al. *forthcoming*). Many sustainability interventions have limited potential for transformational change as they target the highly tangible, but essentially weak, leverage points (Abson et al. 2017). There is an urgent need to focus on less obvious but more powerful

areas of intervention (Abson et al. 2017). One of these promising realms, where high leverage for sustainability transformation is possible, is reconnecting people to nature (Abson et al. 2017; Ives et al. 2018). Human-nature connection can be strengthened, for example, through the practice of sustainable agriculture within multifunctional landscapes that provide material linkages among biodiversity, food, and the rural community (Fischer et al. 2012; Ives et al. 2018).

The human-nature relationship builds on perceptions both at a species (humanity) and a personal level (Lumber et al. 2017). There is a shared idea of what ‘nature’ is in the minds of society, which constitutes a paradigm for that society, representing a deep set of beliefs about how nature and the world in general works (Meadows 1999). At the same time, several personal and social influences, together with cognitive, affective, learnt, experiential, and personality factors, contribute to the personal relationship to nature (Lumber et al. 2017). The multitude of the factors can be situated along a spectrum from people’s outer to inner worlds to form five general types of human-nature connection: material, experiential, cognitive, emotional, and philosophical (Ives

CONTACT Kaisa J. Raatikainen  kaisa.raatikainen@jyu.fi

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et al. 2018). Interventions on nature connection can target any of these types, which correspond to shallow to deep leverage points, with the greatest transformative potential lying in actions that connect people to nature emotionally and philosophically (Ives et al. 2018). Thus, researchers and practitioners interested in facilitating nature connectedness should focus specifically on activities that involve contact, meaning, emotional attachment, or a compassionate relationship with nature that includes engaging with nature's beauty (Lumber et al. 2017).

Our case relates to a specific type of human-nature interaction: management of meadows and wood-pastures within traditional rural landscapes. Meadows and wood-pastures are social-ecological systems that hold significant cultural, biological, aesthetic, and utilitarian values (Plieninger et al. 2015; Raatikainen and Barron 2017), yet they have become extremely rare and threatened by agricultural modernization (Kontula and Raunio 2018). In order to persist, these habitats require active management through low-intensity grazing or mowing. The traditional management of meadows and wood-pastures has ceased in many parts of Europe (Plieninger et al. 2015; Kontula and Raunio 2018). It has been suggested that one of the main contributors to the decline of meadows and wood-pastures is the decoupling of their social-ecological system structure and functions (Fischer et al. 2012; Raatikainen 2018a) which results in management abandonment (Raatikainen and Barron 2017).

Supporting of threatened social-ecological systems, such as meadows and wood-pastures, needs transdisciplinary research that innovates sustainable practices. Here art-science collaboration is one promising approach. Artists' and scientists' socially and environmentally engaged collaboration form a growing field of activist strategies and practices implemented at the time of Anthropocene (Scott 2006; Da Costa 2008; Polli 2011; Demos 2016). We argue that art-science collaboration has unique potential to reach unconventional knowledges, such as intuition; create new information flows that include also emotional elements; and is able to challenge the prevailing societal paradigms by revealing and questioning them. Art further has the ability to creatively propose alternatives to dominant paradigms. Thus, transformative art can be a powerful tool to guide sustainability transition, combined with research that points out the critical needs for transformative action.

If deep leverage points such as paradigms and shared mindsets are reached, changes in them can influence the shallower points, thus transforming the whole system through cascading effects (Fischer and Riechers 2019). For example, the ongoing environmental crises have resulted in calls for abandonment of anthropocentrism (Plumwood 2002), requiring people to have feelings of

empathy and respect towards non-human nature. Such paradigmatic change would likely increase pro-environmental behaviors. In the field of art, a parallel development has been the emergence of posthumanistic thinking, where 'post' refers to abandoning of traditional anthropocentric assumptions to go beyond the concept of the human (Ferrando 2013). Thus, environmentalists and artists alike have been calling for transformative thinking that leads to recognition of the agency and rights of non-human entities.

Some of the art-science projects include participatory and dialogic approaches and educational aims and methods, and they take place in socially engaged art events (Da Costa 2008; Hiltunen 2016; Huhmarniemi 2016; Juhola 2019). Socially engaged art takes usually place in relationships between people, but it can involve also non-human beings and objects. Contemporary art's dialogic, contextual, and situational methods form a background for socially engaged art (Kester 2004; Kantonen 2010). Here the primary goal of the artist is not to create a work of art, but to bring art into people's everyday lives (Jokela 2013). Socially engaged art builds on relational aesthetics, where the realization of art always requires 'you' and 'me' (Bourriaud et al. 2002), and dialogic aesthetics, where art takes place in an internal dialogue within a community (Kester 2004). Thus, the artistic process in socially engaged context is based on jointly chosen current themes, dialogic aesthetics, local community and context, including the place *in situ*. Dialogue can be either verbal or built on any kind of expression, for example, painting or dancing (Kester 2004). While most theories focus on dialogues among humans, some artists-researchers approach animals, plants, and nonliving objects as collaborators and audiences of art (Kokkonen 2017; Ainalinpää 2019). Although artistic results may be displayed, socially engaged art itself has already taken place prior to the exhibition through the process and dialogue created during the art intervention.

Arts-based practices are used and studied for the sense of community and empowerment (Hiltunen 2009, 2016; Leavy 2015, 2018; Haraway 2016). Participatory turn in contemporary art has further increased the use of arts-based practices in diverse sectors of society, such as the social sciences, education, and tourism research (Bishop 2006; Barone and Eisner 2012; Leavy 2015, 2018). Arts-based inquiry has potential to grow creative process and scholarly reflection (Kossak 2013). In education, a need for new transformative experiences has been noted as a response to the environmental crises, eco-anxiety, and discussions on posthumanism (Jickling and Sterling 2017; Foster et al. 2019). Current education philosophers call for pedagogies that change our values to become more holistic and respectful towards non-human nature, and change our lifestyles for humbler (e.g., Lin and Oxford 2011).

In this article, we use the concept of arts-based environmental education referring to pedagogical approaches that utilize arts-based practices as levers for transformative learning on sustainability. Arts-based environmental education aims for deepening connectedness to nature, exploring environmental issues, engaging in problem-solving on local level, and taking pro-environmental action (van Boeckel 2009; Suominen 2016). The respect of nature is thought to grow from tactile and aesthetic nature experiences combined to conceptual, emancipatory, and critical learning.

We explore nature connectedness as an experiential phenomenon within a qualitative art-science case study, with a focus on the potential of arts-based environmental education on supporting management of threatened meadows and wood-pastures. We developed and applied educational practices as part of an interdisciplinary art-science symposium (ISEAS2019). Utilizing the leverage points framework, we reflect on whether an art-science intervention can increase the local community members' and artists/researchers' environmental awareness as well as capacities and capabilities for pro-environmental actions, particularly in conservation of agricultural biodiversity.

The rest of the paper is structured as follows: first, we specify our research objectives, followed by a general description of the arts-based action research methodology. Then we present our case study setting and describe the research data and its analysis. We begin the Results section with a literature-based analysis of the known leverage points in conservation of meadows and wood-pastures, and proceed to our empirical findings, starting with artistic results and continuing with interpretation of the content of the collected material. Finally, the case study is discussed in relation to human-nature connectedness and potential sustainability interventions, which are exemplified by a presentation of additional leverage points emergent from our study.

2. Materials and methods

2.1. Research inquiry

Our research was guided by the question: 'How did the experienced relationship between participants and agricultural nature change during the project?' By participants, we refer to people involved in our case study project: locals and artists/researchers. We further specified agricultural nature to include meadows, wood-pastures, grazing animals, local people, and their interactions with each other. During the project, the investigation further focused on the opportunities of arts-based environmental education practices in facilitating the experience of nature connection within agricultural setting.

We explored the research question from two viewpoints: firstly, that of 5th grade school pupils who participated in the project; and secondly, by ourselves as practitioners of sustainability-oriented art, education, and research. The Meadows and Wood-pastures project presented in this article was based on a collaboration of a Finnish conservation biologist and a landscape ecologist (Author1), a Finnish art educator and researcher (Author3), and a Chilean choreographer and dance educator (Author4). The work was facilitated by a Finnish curator and artist/researcher (Author2), who organized the project within the International Socially Engaged Art Symposium (ISEAS2019), in Svartå, Southern Finland. The authors of the current paper, identified here as both artists and researchers, thus differ in their disciplinary background and experience in artistic and scientific practices, making the project transdisciplinary in principle and practice.

2.2. Socially engaged arts-based action research as a methodological strategy

Our case study is part of a broader arts-based action research (ABAR) on the development of dialogic art among artists and natural scientists in the context of the International Socially Engaged Art Symposium (ISEAS) (Juhola 2018, 2019; Juhola et al. 2020; Figure 1). ISEAS provided the structural framework for the current study, i.e. established connections with the local community, defined the practical boundaries for the artistic intervention, set up the working team of artists/researchers, and provided mentoring and professional documentation for the work. The overall theme of ISEAS2019 was the relationship between humans and nature, and it was organized as a 10-day-long event held in August 2019. Six artists and four environmental experts participated in the intensive work period and created three parallel art-science projects, one of which is presented here (Juhola et al. 2020 provides another example). The projects were supported by a documentary group consisting of one photographer and two videographers, and a mentor.

ISEAS2019 followed the principles of arts-based action research (ABAR), which expands qualitative research methods based on verbal and written language. ABAR is a research strategy that has been developed in the University of Lapland since the 1990s (Jokela 2019; Jokela et al. 2019). ABAR proceeds cyclically in order to combine art and research and develop art-related practices (Huhmarniemi 2016): research learns from previous cycles and research questions are refined during the process (Coutts et al. 2018; Figure 2). ABAR often integrates different theoretical and practical methods. Art is practiced by artists or stakeholders so that tacit knowledge and experiences, which are commonly not conveyed through other qualitative research, can be achieved as research data (Coutts et al. 2018). This is common for arts-based research in general: expressive,

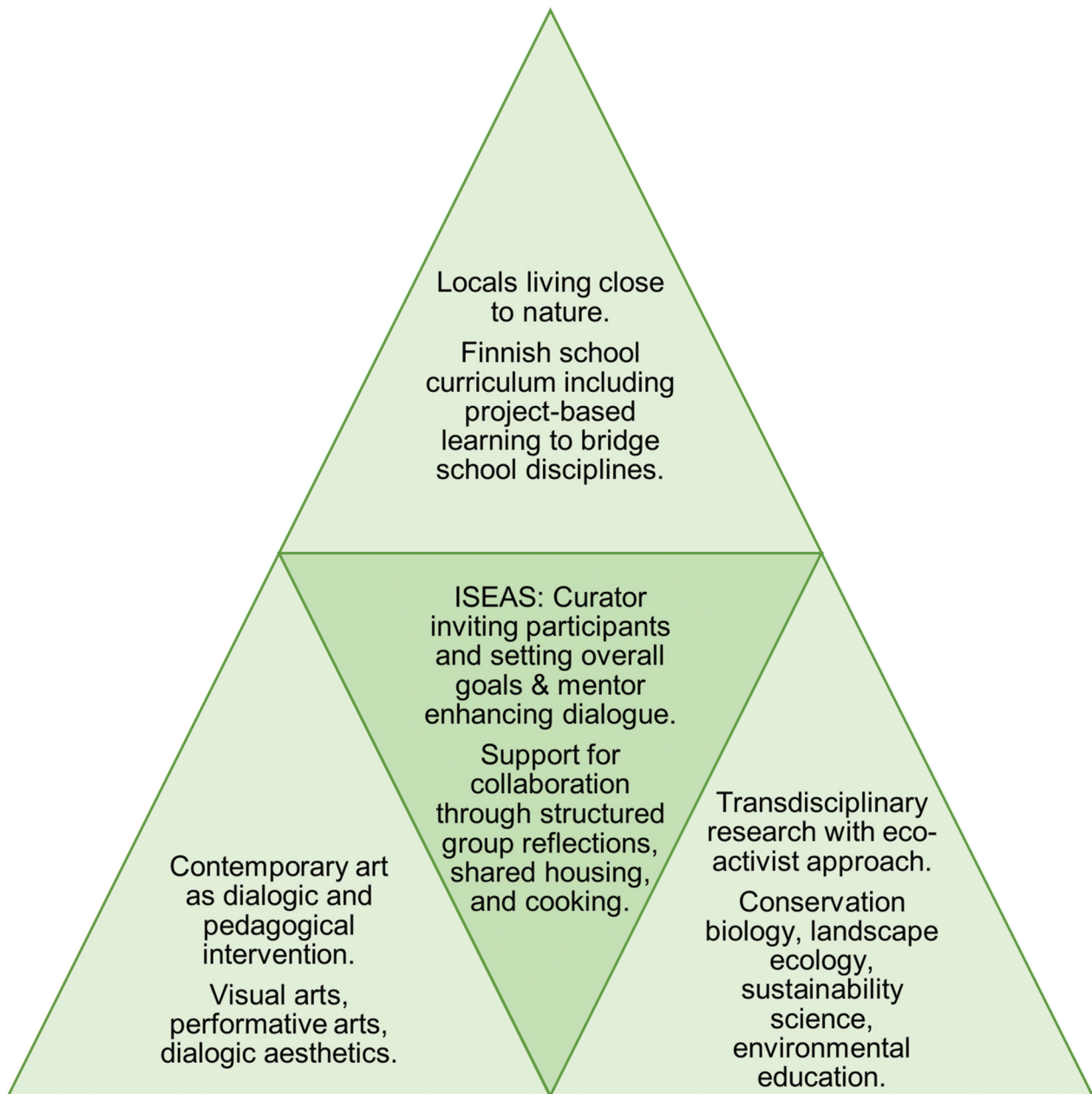


Figure 1. Description of the International Socially Engaged Art Symposium 2019. ISEAS2019 resulted in three art-science interventions, of which the current project was one, with local communities. All projects were interlinked to local environmental issues and networking within and between the teams of artists/researchers and the local community.

aesthetic, symbolic, and bodily means, such as pictures, music, dance, or all of those together, can be conducted to gain data from the participants of the research (Barone and Eisner 2012; see e.g., Leavy 2015, 2018). Art can be utilized in collection of research data, analyzing it, and in representation of research results (Leavy 2018). Arts-based research effectively utilizes aesthetic dimensions in both the research and presentation stages (Barone and Eisner 2012). In ABAR, the results of the research are presented both artistically and scientifically (Huhmarniemi 2016).

ABAR is characterized by intention: in addition to gaining knowledge related to case studies, the aim is to make changes, emancipate, and empower (McNiff 1998, 2013). ABAR is conducted in order to develop better

working methods and approaches that correspond and contribute to changing societies (Jokela 2019). Societal connection is equally important in socially engaged art, where successful projects need local artist networks and in-depth understanding of participants resulting from long-term work (Helguera 2011). In ISEAS2019, the curator, some of the artists, and two of the documentary team members were locals while others were from elsewhere in Finland and abroad (see Juhola 2019; Juhola et al. 2020).

Finally, self-reflection is a common method in arts-based research, which is analytical and holistically reflexive throughout (Leavy 2017, 2018). Thus, reflection formed an important part of our data collection and analysis practices (Figure 2). Unlike in much of

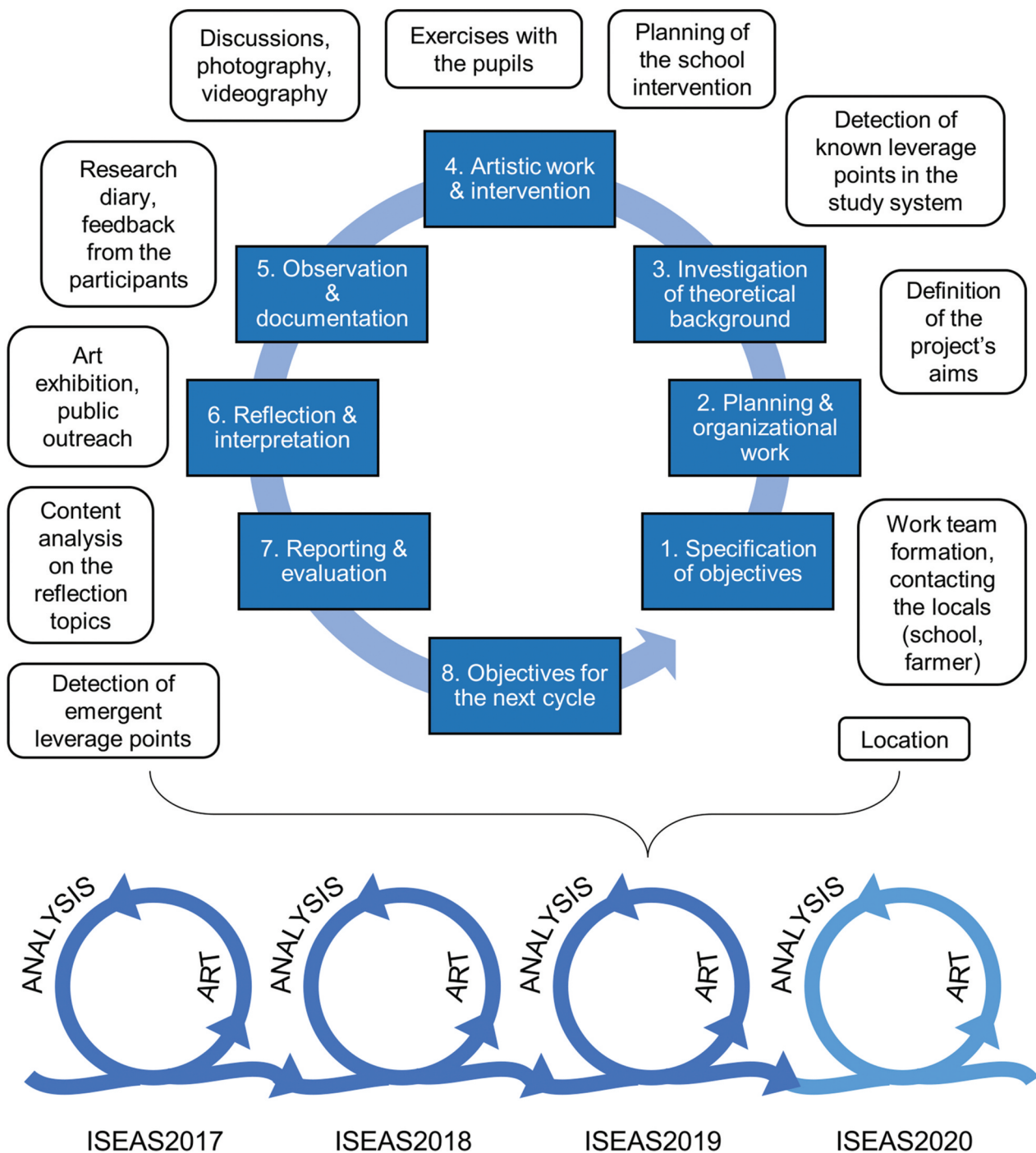








Figure 2. Illustration of the cyclical proceeding of arts-based action research. In reality artistic and analytical phases overlap, and the eight steps described in the blue boxes tend to occur nonlinearly. The current project was conducted during ISEAS2019, which is part of a long-term research based on socially engaged art. Key phases of the project are depicted in white boxes. Adapted from Huhmarniemi (2016) and Coutts et al. (2018).

qualitative research, in arts-based research it is not meaningful to separate the analysis into an isolated stage detached from the flow of research and artistry (Leavy 2018). The arts-based analysis occurs throughout the research process, and although there are often stages of research that are more clearly analysis-oriented or focused on systematic analysis, the analysis methods and processes ought not to be seen as separate or otherwise stagnant pauses but rather an organic and constant flow and interactivity between other research activities (Leavy 2018).

2.3. Case study: the meadows and wood-pastures project

Meadows and wood-pastures are among the most critical habitats of conservation concern in Finland (Kotiaho et al. 2015). While hosting high biodiversity, all meadows and wood-pastures are critically endangered, primarily due to management abandonment that has led to successional overgrowth and local species extinctions (Kontula and Raunio 2018; Raatikainen et al. 2018). Two other important reasons behind the endangerment are clearing of agricultural land, mainly arable fields, and forest

Table 1. Main phases of the project implementation. Photographs provided by Fabio Cito and Katja Juhola.

Timing	Location and brief content	Visualization
Day 1	Workshop at school; introducing the intervention and its topic, ice breaking	
Day 2	Workshop at farm; familiarizing with dairy farming, observing and imitating cows' and horses' gestures, learning about meadow plant diversity and seed dispersal & species interactions; a painting task	
Day 3	Workshop at meadow; learning about species extinction, sensitivity exercises including movement, crafting of willow branch crowns and a second painting task; a wrap-up discussion	
Day 4	Final workshop at school; a trust exercise, writing letters and giving gifts to nature (1st reflection); spreading meadow seeds on school yard	
One month after the intervention	Outreach through social media and newspapers; an art exhibition in a local gallery	
Two months after the intervention	At school; reflective feedback discussion with the pupils (2nd reflection)	

management activities (Kontula and Raunio 2018). All of the three drivers highlight the importance of land-use practices and, thus, direct and indirect human–nature connection in meadow and wood-pasture management and conservation.

Based on this context, the Meadows and Wood-pastures project explored art-science collaboration as an approach to familiarize participants into agricultural nature, biodiversity conservation, and the agency that non-human natural elements, such as animals and plants, have. The core participants were six 5th grade pupils from small Swedish-speaking village school, Svartå school, aged 10 and 11 years, their teachers, a local farmer, and collaborating artists/researchers; a group targeted to us by the curator of ISEAS2019. The participating community members voluntarily and in an informed manner committed to the research and its documentation. Informed consent of the participants or the parents of the pupils was gathered as part of the ethical procedure (see Juhola et al. 2020 for more details). In broader terms, also audiences of the exhibited artworks and media presentation could be considered as participants, but no data were collected from them for analysis.

The project culminated in a school intervention that aimed to support environmental sensitivity through creative arts-based practices in natural settings, and provide the pupils with a basic understanding of the conservational importance of management of meadows and wood-pastures (Figure 2). Also, pupils' self-expression skills were supported through using bodily movements in the form of learning and communicating. The idea was to first connect the mind with the body, and then connect to the environment. The process started with a conscious sensing and learning of one's body, and then continued to understand how everyone is a part of a unique and inseparable system. The cognitive aims followed from the literature investigation (section 3.1), based on which we decided to target the following topics: improve the knowledge on meadows and wood-pastures and their loss, introduce the benefits of their management, emphasize their rarity in the landscape, and underline their manifold values.

During the 1-week long intervention, we visited the school, a local dairy farm, and the Långudd dry meadow (Table 1). On these sites, we arranged four workshops, of which each lasted from 1 to 4 hours and most of which took place outdoors (more details are available in Supplementary Material: Timetable and exercise descriptions). During the workshops, various artistic exercises enabled the pupils to experience and express their relationship with the nearby elements belonging to nature. One workshop took place in each day, and short breaks were kept between the exercises when needed.

After an introductory workshop held at the school (day 1), we visited the dairy farm (day 2), where we familiarized ourselves with modern food production, observed cows' and horses' behavior, and imitated the farm animals' gestures as an inspiration to playful practice. We continued with observing signs of human and animal interaction in the surrounding agricultural landscape, including managed and unmanaged meadows, and painted on field. On day 3, we visited the abandoned Långudd meadow, where habitat loss and species extinction were discussed. The pupils moved on the rocky surface of the threatened meadow bare-handed and -feet and with closed eyes to sense their environment directly through touch. Movement was further used as a means of painting to a large paper canvas. The meadow workshop included crafting of crowns using willow branches and stems of seeding meadow plants, and explaining that the crowns symbolized the power humans have over nature. In the final workshop, held at the school (day 4), the participants reflected their experience by writing letters to nature (see Supplementary material). The intervention ended with pupils spreading seeds of meadow plants to the school yard, to establish a meadow there, and placing the crowns on top of the ground.

The project's exercises were built on a comprehension that respect for nature grows from tactile and aesthetic experiences combined with conceptual, emancipatory, and critical learning (Huhmarniemi 2018; Huhmarniemi and Hiltunen 2018). Aligned with the leverage points approach, it was stated that although people often do harm for nature, they can also change to alternative practices that benefit biodiversity. In all workshops, the ability of humans to do good deeds for nature was highlighted. On the field of environmental education, learning was focused on the ecology and conservation of meadows, with the emphasis on the interactions among humans, grazing animals, plants, and insects. Due to the timing of the intervention (the end of August), specific attention was paid on the adaptations of meadow plant seeds for spreading. From the artistic perspective, the core of the project was in understanding art as a dialogic process and performative event. The variety of artistic practices were implemented partly as arts-based learning methods and partly to learn artistic self-expression while familiarizing oneself with contemporary art.

After the intensive intervention period, the project continued with an art exhibition reflecting and displaying the creative outputs of the workshops. The authors made a plan for the exhibition jointly, and Author2 and Author4 set it up in the gallery with the help of the documentary team. The gallery exhibition

was open to the public for 1 month (September 2019).

2.4. Research data and analysis

The data collection and analytical phases within the arts-based action research cycle are described in Figure 2. The research data were rich in formats and served several purposes. The potential of arts-based practices in supporting nature connectedness and advancing pro-environmental mindsets and behaviors was studied through participatory observations, field notes, and reflections by the pupils and artists/researchers. The artistic results, where expression of the dialogic process was essential, were based on artworks created during the intervention, videographic and photographic documentation of the workshops, and recorded group discussions with the mentor of the symposium. Dialogic aesthetics and reflections on nature connectedness and artistic work emerged also through the various forms of informal dialogue that occurred during the intervention, including group discussions, mentoring, and walking meetings before and after the workshops. The workflow of the project in general and the school intervention in particular was documented by written notes in a research diary format by Author1. The documentary team, including two videographers and one photographer, attended parts of the workshops and produced audiovisual material for the project's representation and research. Author2 guided and followed the work of the documentary team throughout the symposium. The goal of the documentation was to show the process of the intervention, and to exemplify the dialogic interactions created during the symposium. The documentation formed the arts-based visual data for analysis and reflection. It was analyzed by Author2 in order to set up the art exhibition.

At the end of the intervention, and approximately 2 months after it, the team and the pupils self-reflected their experience. The purpose of the first reflection was to record the uppermost experiences and immediate thoughts evoked by the intervention, whereas the later timing of the second reflection gave room for deeper cognitive processing. The authors provided both reflections in written format. The pupils wrote their first reflection as part of the last workshop, and their later reflection was acquired through a 1-hour-long interview with Author2 after the closing of the art exhibition (Table 1). Also the farmer provided general feedback, which was used as data. All reflections were transcribed and their content was subjected to exploration of emergent themes by Author1, using word processor and spreadsheet programs. A thematic coding was done inductively (Elo and Kyngäs 2008). The initial codes were synthesized into a list of recurring topics, which was

accompanied with information on the data source (who reflected, and when). At the next stage, the most often repeated topics were extracted for: (a) all participants, first reflection; b) all participants, second reflection; c) pupils and the farmer, both reflections; d) artists/researchers, both reflections, and; e) all participants, both reflections. The most common topics were used as a basis for argumentation on research findings.

Leverage points framework was utilized as a methodological boundary object as Fischer and Riechers (2019) have suggested: it facilitated the analytical thinking and collaboration of artists/researchers with different backgrounds. The framework was used to investigate the case study context, discussed during the mentoring sessions, reflected in Author1's research diary, utilized in formulation of key conclusions, and relating the results with previous research.

3. Results

3.1. Known leverage points in conservation of meadows and wood-pastures

The project was prefaced with a scrutiny to current efforts to conserve Finnish meadows and wood-pastures, providing background for the school intervention (see Figure 2). Examination of literature indicated that many of the interventions have mainly targeted the shallow leverage points (Figure 3). For example, a national management goal of 60,000 hectares has been stated since year 2000 (Salminen and Kekäläinen 2000), without a true impact on the realized management (Raatikainen et al. 2017). Also, the level of management payments within the national agri-environment-climate scheme contracts has been debated, and gradually increased in the recent agri-environmental programmes.

Better results in terms of supporting the actual management action could be achieved if systemic feedbacks were utilized. These include, for example, increased education on the multiple values meadows and wood-pastures hold (Raatikainen and Barron 2017), and decreasing the bureaucracy that makes the contract-based meadow and wood-pasture management unappealing (Birge and Fred 2011; Raatikainen and Barron 2017). Furthermore, there is evidence for a virtuous cycle of landscape management action (Selman and Knight 2006; Raatikainen and Barron 2017): the managers who appreciate the results of the management are motivated to continue and expand management. However, only a restricted group of people express such self-reinforcing motivation for management (Raatikainen and Barron 2017). This indicates how reinforcing feedbacks are not among the most effective places to intervene in a system; they are not pansystemic but tend to affect

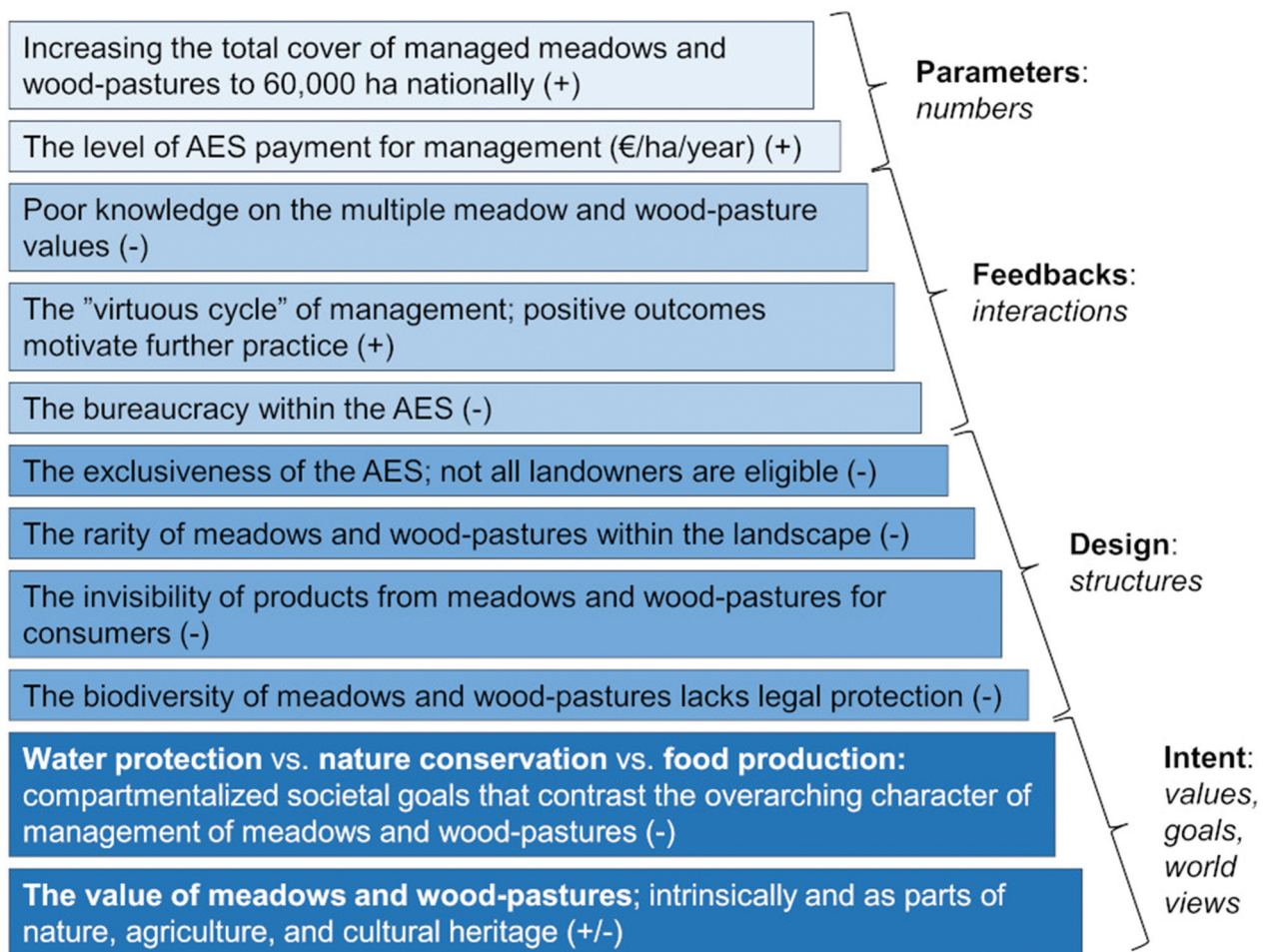


Figure 3. Leverage points for system transformation in management of meadows and wood-pastures in Finland. The leverage points are grouped according to system characteristics; shallow points are on top and with lighter shading whereas the deepest leverage points underlie the system and thus are drawn at the base of the figure (Abson et al. 2017). The actual levers are derived from literature (Salminen and Kekäläinen 2000; Kaljonen 2006; Birge and Fred 2011; Raatikainen and Barron 2017; Raatikainen et al. 2017, 2018; Raatikainen 2018a, 2018b). '+' corresponds to a lever encouraging management, and '-' marks a lever discouraging management. AES = Agri-environment-climate scheme; the governance system which controls and directs the way meadows and wood-pastures are managed within Finland.

only certain parts of a system, or occur in restricted circumstances (Meadows 1999; Abson et al. 2017).

Design-wise, there are systemic structures that tend to work against management of meadows and wood-pastures (Figure 3). For example, it is difficult for non-farming landowners to apply for management funding (Raatikainen and Barron 2017). Also, the scarcity of meadows and wood-pastures challenges the management arrangements due to difficulties in transportation and monitoring of grazing animals over long distances from farmstead (Raatikainen 2018b). The rarity of meadows further decreases the viability of the specialist species' populations, as habitat isolation prohibits species dispersal and makes the populations prone to extinction (Raatikainen et al. 2018). Economic support for management is lacking, as products derived from meadows and wood-pastures remain rare in the markets (Birge and Fred 2011). The marginal role of meadows and wood-pastures is further reflected in their meager

presentation within the national legislation. The conservation and agricultural statutes strongly emphasize other habitats with more profound economic value and wider distribution. Also on European level, integration of wood-pastures into agricultural and conservation policies has proved to be challenging (Plieninger et al. 2015).

The deepest leverage for advancing – and disadvancing – conservation of meadows and wood-pastures can be found in the underlying societal goals and values. A disconnection from agricultural function on the one hand, and isolation to conservational role on the other hand, has marginalized meadows and wood-pastures within the current policies, farming practices, and the rural landscapes of Europe (Fischer et al. 2012; Plieninger et al. 2015; Raatikainen and Barron 2017; Raatikainen 2018a). For example, the Finnish rural development programmes have a long history in emphasizing rural well-being and water protection at the expense of biodiversity protection (Kaljonen 2006). Rural policies are

typically built on monofunctional institutionalized sectors with little co-operation, which makes governing management of social-ecological systems complicated (Plieninger et al. 2015). Sectoralization is further reflected in the socially shared discourses of managers and land-owners that show differentiation among conservational and farming-related perspectives on meadows and wood-pastures (Raatikainen and Barron 2017).

Thus, a potentially influential conservation strategy would connect meadows and wood-pastures to contemporary and innovative farming practices (Birge and Fred 2011; Fischer et al. 2012; Raatikainen and Barron 2017), while supporting community-led efforts to create new, direct links with nature (Fischer et al. 2012). Transformation-oriented conservation would strengthen the material, experiential, and cognitive types of nature connection, which correspond to shallower leverage points (Fischer et al. 2012; Ives et al. 2018). To be successful, sustainable management of meadows and wood-pastures needs additional leverage from deep within the system, which means promoting emotional and philosophical nature connectedness. The interventions targeting the 'inner' connections can influence the underlying goals and values, but the impact is hard to achieve (Abson et al. 2017; Ives et al. 2018). A promising way forward is to use approaches that are able to touch people's emotions and world-views, such as environmental education and art, which we utilized in the current project.

3.2. Artistic results

In arts-based research, artworks are often considered as central results of the research process (Barone and Eisner 2012). In this study, we applied socially engaged art and dialogic aesthetics (Kester 2004; Kantonen 2005, 2010). Thus, the quality of the collaborative process and experiences *in situ* form the core of the artistic results. The art here is the dialogic process that took place in the intervention and was documented using various research data types. The process described in this article was also displayed in an exhibition and edited into a documentary video to increase the societal impact of the project as well as transparency and transdisciplinarity of the research (Supplementary Material: Meadows and Wood Pastures 2019).

Most of the artistic intentions combined dialogic aesthetics with ecological consideration. The used materials were either collected from the place or were relatively environmentally friendly, and the arts-based practices were inspired by the surrounding nature. The pupils' aesthetic agency was respected as they were not pushed to dance or perform, but gently guided to get familiar with their bodies through movement. From a shyish start, the pupils relaxed and opened up as the intervention proceeded. By means of playful

bodily movements, the pupils explored and expressed the nonverbal language of animals and the spreading of meadow plant seeds in a symbolic manner. Documentation was carried out with sensitivity: the focus of the moment was not disturbed by filming or photographing.

The art exhibition was held at gallery Fokus in Karis, Raseborg, Finland, for 1 month straight after the intervention. The exhibition included a video artwork (Supplementary Material: Dance01 2019), enlargements of selected documentary photographs, the willow branch crowns, letters to nature written by the pupils and the artists/researchers, and paintings made by the pupils during the field workshops. Author4 held a meditative dancing performance in the opening event of the exhibition. The exhibition had a calm atmosphere and it conveyed the sensitive practices of the intervention. The focus was to portray the creative and empowering process, where a transformative experience towards bodily relation with nature was established. The experiences were also shared to social media forums, especially on a local level as well as among peer researchers.

3.3. The participants' relationship to agricultural nature

The analysis of the recurring topics within the first and the second reflection materials provided information on the participants' experienced nature connection at the project's end, and after a two-month period (Table 2). All reflections underlined the importance of doing and feeling, corresponding to the action-orientation of the intervention. Nature, in the sense of ecosystems and the environment, was considered as an important element by the artists/researchers, who conceptualized and evaluated its role throughout the project. Interacting with farm animals and having fun were also key elements, especially directly at the end of the intervention and for the pupils and the farmer. Later reflections brought up additional topics related to body, sensing, learning, and knowing. There were slight differences in the emphases of the reflections among the participant groups, as indicated in Table 2. The pupils and the farmer paid more attention to the actual field exercises which characterized the intervention. The artists/researchers emphasized the ideology and value constructs that underlaid the whole project and were conveyed through the activities. The distinction was the clearest when issues relating to values, environmentalism, and ways of connecting (both practical and abstract) were reflected. These topics exclusively occurred in the reflections by artists/researchers, which has been taken into account in Table 2.

Table 2. Key topics in the self-reflections. Data categorization is based on grouping of participants and reflection material in question. Seven most prevalent themes under each data category are marked with their frequency within the analyzed data, with the exception of the 3rd column where nine topics are given as the two most frequent ones represent only artists/researchers' perspective (shown in brackets). The order of the thematic topics follows a rough grouping: first tangible elements or characteristics of the project are listed, then actions and interactions undertaken, and finally the abstract concepts and intent underlying the project.

The most common topics	All participants, 1st reflection	All participants, 2nd reflection	Pupils and the farmer, both reflections	Artists/researchers, both reflections
Nature	18	30		47
Body		21		
Animals	11		5	
Farm			6	
Crowns			6	
Fun	11		7	
Feeling(s)	20	49	13	56
Doing	52	48	31	69
Being			4	
Learning		15		
Seeing	9			
Sense and sensing		24		36
Connecting		(74)		74
Biodiversity	9			
Knowledge		29		32
Values and environmentalism		(97)		97

In their first reflection of the intervention ('Letters to nature'; see Supplementary Material: Timetable and exercise descriptions), the participants emphasized the positive feelings they had felt during the week, ways of doing and sensing in the exercises, and topics related to nature, including biodiversity and farm animals. For example, the pupils stated that 'we had fun and laughed a lot', 'it was important to meet the cows', and 'people accidentally kill species even though they do not want to'. In the final exercise ('Gifts to nature'), the children connected the practices of the project to their earlier knowledge. Examples of this were emphasizing the importance of not trashing and picking up plastic (which was done at the field sites), and mentions of higher-level abstract valuations, such as respect to nature (regularly discussed in the workshops).

After the art exhibition, author2 visited the school and shared the displayed photographs to the pupils. The children were excited about the photographs and while looking at them, they recalled the exercises and asked each other questions like 'Do you remember, we did this and that?'. During a reflective discussion, the pupils mentioned that being with the cows and making the crowns were the two most significant memories. They also remembered well their gifts to nature, and the various movement exercises. The pupils clearly understood the overall importance of movement in the project; the connections between moving and dance expression, and the body language of the cows and themselves.

The farmer provided feedback on the project in early November, and he considered that 'it was nice that the kids visited the farm; I like when guests come over'. He continued that the project did not bother him in any way, and he had fun while interacting with the pupils.

The artists/researchers self-reflecting their experience during the intervention by acknowledging that although being nature-lovers, their everyday life had isolated them from a vivid nature relationship. Author1 considered that nature connectedness is not something that can be taken for granted:

I have learned that the relationship between people and nature has to be built, it is not something that just emerges by itself. [...] This relationship is not built solely on knowledge. It is built also through doing, experiencing, sensing. Being open.

The posthumanistic paradigm (Ferrando 2013) was pondered in the group discussions as it influenced the practices carried out in the intervention. We discussed agency of non-human beings and nature on general level, and more specifically through movement of animals, plants, and finally, of meadows in the agricultural landscape. In the workshops, it was explained how flowers in the meadows have many strategies of spreading their seeds, and thus move in the landscape and affect the ecosystems they colonize. The role of biodiversity as a core value, based on the idea that ecological diversity as an evolutionary product is the utmost manifest of nature, and independent on whether its existence is supported by human action or natural processes, was pondered as this theme was underlying the intervention. We concluded that the acknowledgement of the agency and intrinsic value of nature is essential for growing into environmental responsibility, and recognition of the rights of non-human nature can lead to increasing empathy.

In the second self-reflection, carried out 2 months after the intervention, the positive feelings and the importance of being active and mindful were again mentioned. In addition, human-nature relationship,

biodiversity, human agency, and the responsibilities humans have for nature were reflected. Other recurring topics were those related to bodily experiences: body, sense, and self. These included tangible experiences on losing one's sense of self:

Touching and feeling the ground, the vegetation, and the farm animals connected us back to nature. There were moments when I lost the feeling of my bodily boundaries and became merged with all the living and nonliving things around me. I was truly alive, and I was part of a larger entity. – Author1

Author4 further thought that a real way to change and improve people's relationship with the world included a feeling of unity and equality to understand that 'we are all one':

Learning through the body allows us to empathize, break down hierarchy barriers, eliminating the chain of domination with which we have learned to relate to our environment, and placing ourselves in the same place than all the species: this allows us to realize our interconnections and how we depend on everything.

The visit to the modern dairy farm raised a variety of ethical considerations in the later reflections. On the one hand, we agreed, according to research ethics, to respect all participants and were grateful to meet a farmer who was considerate of nature and honored his profession. On the other hand, we felt unease with the ethical and ecological problems in industrialized food production and with our way of presenting the dairy farm to the pupils without discussing animal rights concerns. We raised four specific issues. Firstly, as common practices in dairy farms include cow-calf separation soon after birth (Vetouli et al. 2012), the calves are separated from the cows at a very young age, thus violating their species-specific development needs. Secondly, the cows are milked by a robot, and following from that can be seen as parts of a 'milk-producing machinery'. Thirdly, the milking cows are not allowed to pasture, thus denied of their biological behavior and not contributing to ecologically important grazing practices. Fourthly, the observed practice of dairy production had led to abandonment of meadow and wood-pasture management, which was the key eco-ethical dilemma for the whole project. Thus, although we were able to show the pupils contemporary farming practices in an authentic environment, and connected the functioning of a modern dairy farm with loss of agricultural biodiversity, we were later concerned if the pupils got too positive image of dairy production in Finland from the animal rights' perspective.

Our final reflections voiced accounts of transformative and environmentalistic action. We felt strongly that it is possible to turn thoughts and ideas into actions, and that relatively small interventions and practices can

initiate a transformative process. The experience strengthened the belief in arts as potential means towards sustainability:

I believe that art is one of the most important ways of protecting our environment. [...] Community art is at best like a stone thrown in the water, with ripples growing bigger and bigger. – Author2

4. Discussion

We found that by incorporating scientific and local knowledges in artistic action, using crafting and creative expression, an informed and experiential connection with nature can be facilitated. This informed experience can support the formation of a sustainability-oriented philosophical paradigm that conceptualizes a mutual relationship between people and nature (Abson et al. 2017). There is evidence that an exclusive focus on scientific ecological knowledge may lead to a superficial contact with nature, whereas a deeper nature connectedness is fostered through activities that involve contact, meaning, emotion, compassion, and beauty (Lumber et al. 2017). In Meadows and Wood-pastures project, all of these dimensions were included. Ecological knowledge was introduced through informal teaching that occurred mainly on field, contact with nature was established in the various exercises, felt emotions were emphasized by the project participants, meanings were expressed and communicated both verbally and nonverbally, compassion was included in the reflections on ethics and posthumanism, and the aesthetic value of the surrounding rural landscape was repeatedly discussed. Interaction with the farm animals was a crucial mediator linking the project's informative content with the emotion-evoking experiences. Physical contact with farm animals can initiate a calm and positive feeling that builds on the warmth from the animals, a sense of closeness, and their affection (Pedersen et al. 2012).

Although the emotional and experiential nature connection is undeniably crucial (Lumber et al. 2017), our project indicated that it is beneficial to link it to knowledge building and value-based nature appreciation. Playful practices do not achieve their full potential in terms of arts-based environmental education, if the cognitive learning process is lacking. In our case, the pupils stressed the importance of meeting the cows, but it was the artists/researchers who described the same situation as animal-assisted nature connection. The project would have benefited from a clearer link between the underlying abstract concepts and the intervention exercises. This being said, the potential of the playful methodologies has been augmented by several researchers as more-than-cognitive or more-than-verbal ways of knowing and acting (Haraway 2016; Huhmarniemi 2018;

Huhmarniemi and Hiltunen 2018), thus going beyond the more traditional teaching methods. Thematic arts-based environmental education is a way to support both the agency of children and the communities of kindergartens and schools (Huhmarniemi and Hiltunen 2018), but we argue that also the thematic content needs careful planning, so that the message behind the exercises becomes clear.

The underlying message throughout our intervention was management to increase and safeguard biodiversity and counteract species extinction. We found out that the cross-sectional idea of human-nature connection in the project corresponded to that of ecosystem stewardship (Chapin et al. 2015). According to Chapin et al. (2015), ecosystem stewardship builds on three key elements: firstly, it motivates action towards ecosystem resilience and human wellbeing; secondly, it integrates ecological and social processes; and thirdly, it emphasizes actions that shape the future rather than seeks to restore the past. We further expressed stewardship thinking through the crafting and handover of crowns, which symbolized humanity's ability to impact nature. Symbolism supports nature connectedness as it expresses transpersonal experiences, creates and represents positive ideas, and conveys meanings (Lumber et al. 2017). Symbolism is also inherent in arts, making arts-based approaches powerful and meaningful tools for developing, conceptualizing, and expressing one's nature relationship.

Philosophical perspectives and emotional responses have potential to influence the underlying goals and values embodied in a social-ecological system; yet in reality, interventions targeting different types of nature connections need to occur in concert, because they can be expected to interact (Ives et al. 2018). In the context of management of meadows and wood-pastures, we suggest that adopting the stewardship approach as a general intent would be highly beneficial, but to reach this deep philosophical level, actions that have shallower impacts are also needed. In Table 3, we suggest new levers to improve conservation of meadows and wood-pastures that add to the previously researched ones depicted in Figure 3. As our focus was on the deeper leverage points and inner types of nature connection, our findings can contribute to a larger change towards ecologically more sustainable agricultural practices that are based on stewardship thinking. However, we understand that in industrialized societies, abandoning the ideology based on infinite resource extraction calls for profound changes in the food production systems which needs more research.

Our project outlined the ecosystem stewardship approach both on societal and individual level. On general level, rural landscape was conceptualized as a social-ecological system to which an environmentalist mindset was developed. Upon this basic idea, we developed a framework of exercises within which

the individual-level connection to nature could be developed, or strengthened, through arts-based practices. For individuals who have felt mentally and/or physically distanced from nature, reconnecting becomes possible if they are able to extend their concept of self to include nature (Lumber et al. 2017).

Arts-based practices can combine imagination and knowledge to create empathy and subjective understanding of a person as a conscious actor, able to self-critique and innovation. If connection with nature is seen as a cognitive and affective construct with aspects of personality and experience (Lumber et al. 2017), arts-based practices can be used to bridge all of these personal aspects together, and connect them to the broader social context. Here lies the significant potential of arts-based practices to support sustainable, mutually beneficial human-nature relationships. In our intervention, ecological knowledge was tied to the experience of the human body and understanding of the world, making it tangible that nature is influenced by each of us, and the collective impact of small decisions can be great.

Given that an individual can actively build his/her relationship to nature, we further argue that this process benefits from an emphasis on agency, sustainability, and environmentalism. This allows for learning to act based on both knowledge and values. Meadows and Wood-pastures project focused on active doing and feeling; experiencing and sensing the nature. Our approach is rather novel when compared to traditional environmental education programs, which usually deliver scientific knowledge and observational skills, without clear increases in nature connectedness (Lumber et al. 2017). While many of our exercises focused on being present in one's own body, they actually made the participants to open up to sensing the others and the environment, and adjust their movement and behavior accordingly. Together the sensitivity exercises and nonverbal dialogue represented various actions and interactions, leading to a nested understanding of ones' body/self, which is analogous to the design of a system (Abson et al. 2017; Table 3). We used various exercises to expand the learning from self-recognition to interaction among the participants, to include also other beings (farm animals, plants, living branches), and finally non-beings (rock), all together forming what is 'nature' in the specific place. We argue that in this embedded nature connectedness lies significant motivation for management of meadows and wood-pastures, being directly linked to conservation of biodiversity.

Embedded nature connection can also lead to eco-anxiety (Searle and Gow 2010). Because of the dire character of the environmental crisis, positive feelings and having fun were supported during the exercises, and participating pupils often reflected these topics. It is important to approach burdening environmental

Table 3. Summary of five potential leverage points for supporting reconnecting to nature within the context of management of meadows and wood-pastures, emerging from the current research.

Leverage point ^a	Lever	System characteristic ^b	Type of nature connection ^c
The gain around positive feedback loops	Interactions among doing, learning, and motivation: the arts-based exercises facilitated multiple ways of being, sensing, feeling, and action.	Feedbacks	Experiential
The structure of information flows (access to information)	Combining art and science to support development of an experiential and informed connection with nature. Art-science collaboration is able to synthesize different knowledge types and create new insight on human-nature interactions.	Design	Experiential & Cognitive
The power to add, change or self-organize system structure	Developing an understanding of a nested body/self in connection with other humans, then non-humans, and finally the nature, through bodily engagement and dance expression.	Design	Cognitive & Emotional
The mindset/paradigm out of which the system arises	Promoting ecosystem stewardship as the underlying conceptualization for human-nature relationship on both personal and societal level.	Intent	Philosophical
The power to transcend paradigms	Recognizing the rights and agency of non-human nature. Art as a tool to critically evaluate predominant mindsets and create alternative worldviews.	Intent	Philosophical

^aLeverage points according to Meadows (1999).

^bSystem characteristics according to Abson et al. (2017).

^cNature connection typology according to Ives et al. (2018).

topics with positivity to support hope and ability to function (Salonen and Bardy 2015; Pihkala 2017, 2018; Värri 2018). As studies on green care interventions demonstrate, the possibility to interact with farm animals alleviates already existing anxiety and other psychological or mental health illnesses (Pedersen et al. 2012; García-Llorente et al. 2018). Thus, connection with farm animals may well facilitate education on environmental crisis by creating an emotional safe space within which also mentally straining topics can be dealt with. Positivity needs to be treated with consideration, though. For example, constructive hope and hope based on denial should be differentiated (Ojala 2015). Whereas constructive hope is positively associated with engagement and a future-oriented, positive, and solution-oriented communication style, denialism is connected to less pro-environmental behavior and communicating in a pessimistic way (Ojala 2015).

The strength of art-based practices in dealing with global environmental crises is in the opportunity for deep, even existential and spiritual, experiences that are in touch with the body and mind, as well as ideologies and emotions (e.g., Pihkala 2017). This was evident in the reflections of the artists/researchers themselves that documented dialogues on profound issues such as critique on anthropocentrism. Challenging the invisible profound is essential for the human capacities and in reaching the deepest leverage points (Meadows 1999; Abson et al. 2017; Akulukjuk and Rasmussen 2019; Fischer and Riechers 2019). Furthermore, arts-based practices can support self-confidence, empowerment, and the capacities to be initiative in ones' own environment and life circumstances (Huhmarniemi and Hiltunen 2018; Jokela 2019). All of these are needed in achieving a more sustainable way of life.

In sum, arts-based practices seem highly beneficial to sustainability transformation. Art is motivating, supports self-expression, provides tools for connecting

with nature, and embodies the ecological interactions which humans are part of. The latter parallels with power relationships, as a body dominated by structures reflects similar relationships as the environment, again based on structures of domination. A free and open body is able to understand its environment as an equal that does not belong to it but is part of it (Naranjo 1992). This idea is important, since the basis of learning to coexist with nature, or: exist in nature, being reconnected to nature, is to relearn the way we relate ourselves to our environment. One pathway for this learning process starts with an understanding of how we relate to our body and the bodies of others, to create the recognition of ourselves and nature as equals, in order to break and rethink the prevailing domination structures.

We set out to search for tools to counteract the loss of meadows and wood-pastures by exploring their role in reconnecting people to agricultural nature. We discovered that arts-based environmental education supports pro-environmental mindsets, if the interventions strengthen various dimensions of nature connectedness. Art has the ability to make real impact on people's thinking and the surrounding environment, when art projects include management actions. Leavy (2018) states that art as its best can be both immediate and lasting. The immediate can be seen in the light of dialogic aesthetics (Kester 2004), where new information flows and knowledges are created. In addition, art has the potential to promote engagement, make a lasting impression, and change the way of thinking (Leavy 2018). Thus, the lasting impact of art can be seen as reaching deep leverage.

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

Supplementary materials

The supplementary data for this article can be accessed [here](#).

Timetable of the project and exercise descriptions

Dance01 2019 (video art)

Meadows and Wood Pastures 2019 (documentary video)

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