

Co-Creation Labs: Fostering Innovative Ways of Communicating for Sustainability

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Abstract

The growing attention to wicked sustainability issues⁵ has called for new approaches that go beyond traditional practice of producing and transferring knowledge from science to society. Thus, there has been an increasing interest in 'co-creation labs' as novel spaces for experimentation, social learning, and cross-sectoral collaboration. This paper discusses the rationale of a co-creation lab as a communication platform for joint construction of meaning and co-creation of knowledge to enhance our capability to navigate wicked situations. Part 1 of the paper explores the communicative context and outlines our theoretical position. Part 2 turns to conceptualizing the Mistra EC Co-Creation Lab and discussing the different methods and tools used in this setting.

Keywords: knowledge co-production, co-creation, labs, wicked issues, transformative learning

Introduction

The growing attention to wicked issues in environmental and sustainability discourses has prompted an urgent need for new ways of knowing and acting that go beyond traditional practices of producing and transferring scientific knowledge from academia to society. In light of this, there has been an increasing interest in 'co-creation labs' as novel spaces for experimentation, social learning, and cross-disciplinary as well as cross-sectoral collaboration for sustainability transformations. Despite the widespread emergence of different 'lab' models, little is known about their effectiveness in shaping collaborative learning, communication and change processes.

Within the Mistra Environmental Communication (Mistra EC) research programme (2020-2023), a Co-Creation Lab was designed as a co-creative space to support sustainability transformations through transformative learning processes, and to reframe environmental communication towards communication for sustainability. The lab brought together a diversity of academic and societal actors (CSOs, NGOs, business, community groups, national and regional authorities, etc.) to develop transdisciplinary partnerships with the aim to rethink our communicative practices. As we see it, communication in such contexts involves both cognitive and affective states. Thus information sharing is important but also 'not knowing' (Bussey and Sannum, 2017), working with vulnerability, chance, uncertainty and hope, and the desire for quality futures for community, environment and planet all contribute to the co-creative process.

In short, the aim of the Mistra EC Co-Creation Lab is to provide a relational space within which we, together and *in relation to each other* and our current knowledge and experiences, can explore and challenge our assumptions about what constitutes effective environmental communication. In such spaces people can gather, bringing their own knowledges into the collective as partial, possibly productive assets in our quest to devise responses to climate change and communicate these across often intransigent boundaries. These people might likely be strangers drawn together as they share something in common: their humanity, their concerns and inspiration and the growing consciousness that each part is bringing something unique to collective action and to styles of communication that grow from the convergences a co-creation lab promotes. Thus we wonder, as does J. Drew Lanham, pursuing a convergent imagining:

"...if certain strangers had met, what would their coming together have meant? Circumstances dictate chance. Chance fosters possibilities. Could a conversation create its own momentum? Could *separate* suddenly become *conglomerate* with a greater mission?" (Drew Lanham, 2021).

This research project was conceived precisely because we recognise the need for such a productive 'convergence'. There has, for well over a decade, been calls for learning and communicating in innovative ways which can take us beyond our own world views, values and frames of reference in order to bring rigor and inform 'communication for sustainability' (Folke, Hahn, Olsson, & Norberg, 2005; McGreavy et al., 2015; Newig et al., 2013).

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⁵ I.e., issues characterised by interlinkages, complexity, unpredictability, uniqueness, difficulties of conceptualization, and which are not solvable with traditional methods. Furthermore, these situations are hard to navigate in a 'right' way, but rather in ways that are better or worse.

In allowing space to probe and perceive beyond our own frames, we argue, environmental communication is strengthened as a practice of sensing across various scales, contexts and perspectives. Thus this project is concerned with testing (and perhaps establishing) the effectiveness of this model as well as in outlining the thinking behind the MISTRA co-creation lab.

Understanding environmental communication as a field of discursive struggle in which, as McGreavy and her colleagues argue “symbolic and material configurations” (2015, p. 1) are frequently contested, the lab has the potential to bring this struggle to the fore, and into a creative process. Additionally, the lab takes power differentials and conflicts into account by not privileging specific positions over others, thereby enabling a dynamic and more inclusive understanding of environmental communication in research, policy and practice. In sum, this research takes environmental communication as a dynamic, contested space (Fraser & Schalley, 2009; McGreavy et al., 2015) that is potentially enriched via co-creative engagements with a wide set of disciplines and practitioners (Galafassi et al., 2018; Voorberg, Bekkers, & Tummers, 2015). It is our hope that this communicative milieu fosters transformative behaviours and folds back into insights that inform more effective communication for sustainability.

The aim of this paper then is to explore the communicative praxis and rationale for the Mistra EC Co-Creation Lab as a platform for joint construction of meaning around sustainability practices as well as for co-creation of knowledge and practices that could enhance our capability to act and navigate wicked sustainability issues. The paper falls into two parts. In **Part 1** we offer an exploration of the communicative context and an outline of the theoretical position being taken in regards to co-creation for ‘communication for sustainability’. In **Part 2**, we conceptualize the MISTRA Co-Creation Lab itself, including its structure and the methods and tools being used in its deployment.

Part 1

Communication is messy!

With the release of the 6th IPCC Global Climate report⁶ (2022) it becomes clear that humanity is failing to meet its mitigation and sustainability goals. The report notes for instance:

“Total net anthropogenic GHG [Green House Gas] emissions have continued to rise during the period 2010–2019, as have cumulative net CO₂ emissions since 1850.” (IPCC, 2022, p. 5)

This is not good news and has led researchers to question how best to communicate their work to society, not least concerning a wicked problem such as the climate crisis. It is clear that there is a communication problem that is hindering the transfer, and uptake, of scientific knowledge in policy and practice. We acknowledge that context is significant here, communication is contextual with factors such as institutional inertia, resistance to change and economic and political concerns all shaping the environment in which communication succeeds or fails. Nonetheless, communication for sustainability is certainly not as effective as it could be. This leads some researchers to question their faith in the ‘scientific project’ of the past few hundred years as the ultimate source of knowledge production. In this context, researchers must ask: “Are there other ways to create and communicate knowledge? Are there other valid and legitimate sources of knowledge? If so, what are they and how can we engage with them?”

Part of the communication problem we face is that traditional modes of communicating scientific knowledge seem to be getting us nowhere. Communication is messy. We all think we know what we are talking about but in fact, as Fraser and Schalley note, communication is both complex and elusive, having “over the centuries... developed a richly interlocking tapestry of meanings and cultural connotations” (2009, p. 136). They call for an inter-cultural approach to this problem. Yet some are getting impatient. Bruce Glavovic (2021) and his colleagues, for instance, argue this failure to communicate sits at the heart of climate and sustainability science. They declare that the ‘science-society contract is broken’. This sounds pretty serious, right? But what is this contract they are talking about? Well, they put it succinctly:

“There is an unwritten social contract between scientists and society, whereby public investment in science will lead to an improved understanding of our world and help achieve outcomes that are deemed beneficial to society” (Glavovic, Smith, & White, 2021, p. 1).

We need to do something different and that is what co-creation labs are all about. Co-creation labs are seeking to explore and test new forms and platforms for knowledge co-creation and, of course, new ways and forms of communication. And this communication needs to be creative, dialogical and open, to transcend the ‘expert’ driven in the traditional science-society model we have inherited (Latour, 1991). Ravetz, in describing ‘post-normal

⁶ The report is available here: <https://www.ipcc.ch/report/ar6/wg3/>

science', demonstrates that science is a social tool and like all social tools, it is deeply compromised being implicated in contemporary political, economic and cultural agendas (Ravetz, 2011).

His assessment helps us understand why, despite all the scientific information at hand, things keep getting worse. Glavovic and colleagues offer a grim diagnosis of the problem, but they do something important at the same time. They link research and scientists with advocacy and activism. This link is very important as *we are researching in order to advocate for more effective forms of communication and engagement*.

We are not looking for answers or solutions. Why? There are no 'silver bullets' here. The need for answers is what got us into this problem (Machado de Oliveira, 2021). The nature of the 'wicked' situation is that there is no definitive solution. Timothy Morton points out that the quest for answers is 'impossible, because things are intrinsically mysterious' (Morton, 2018, p. 16) and there is a high level of complexity and uncertainty. We are, as Nora Bateson puts it, 'entangled' in 'transcontextual' contexts (Bateson, 2021).

Transcontextuality demands imperfect tools that allow for dialogue, paradox, growth and surprise as part of research. It is not about giving up, but rather about finding a new way forward. Communication in this context rests on new modalities and ways of appreciating the other and on "not just studying communication, but also doing communication - it is communication about communication" (Fraser & Schalley, 2009, p. 137). Importantly, we do believe in the science-society contract. For the authors of this paper that means we need to be sensitive to context, to not expect too much from our tools but also to actively seek out others with different types of experiences and knowledge and test methods, such as the co-creation lab, in order to contribute to public debate and decision making around environmental and sustainability issues. But what do we mean by 'co-creation lab'?

What do we know about labs?

The concept of the lab is a direct analogy with the laboratory of scientific imagination. It is a space for social and cultural experimentation in which knowledge, ideas and even products are developed and tested by those engaged with the purpose of the lab. One recent and highly successful approach to labs can be found in the 'Living Lab' movement (Liedtke, Jolanta Welfens, Rohn, & Nordmann, 2012; Mazutti et al., 2020). The purpose of such labs is to generate and support "... a network that integrates both user centered research and open innovation" (Leminen et al, 2012, p. 6). In describing urban living labs the CSIRO noted that "Urban Living Labs provide a 'safe space' for collaboration and a testbed for innovation, going beyond business-as-usual and demonstrating the potential of alternative ways of thinking." The University of Western Sydney's Young and Resilient Research Centre have a living lab project called Intergener8. They offer a broad and open understanding of their project noting that "The essential components of Living Lab initiatives are that they are multidisciplinary in focus and have some broader strategic opportunities." (LivingLabs)

Co-creation labs display these features but are explicitly mission driven in that they seek to generate new communicative praxis in regard to sustainability and social transformation. This means that there is a futures dimension built into the goals of the labs as they seek to effect transformation in participants that advantage planetary stakeholders well into the future. For instance, this dimension is made explicit in UNESCO's Futures Literacies Labs (FLL) which function to make explicit anticipatory assumptions shaping individual and collective decision making (Miller, 2018; Raleigh, 2018).

It has been argued by Joosse and her colleagues that 'research-as-usual' fails to effectively engage with the issues and processes framing our historical situation (Joosse et al., 2020). Such is the complexity and uncertainty of our contemporary context (Sardar, 2010) that we need to think in terms of layered and mutually informing processes of systemic co-inquiry (Ison, 2017). This thinking needs to be transdisciplinary and intersectional in order to address the human and more-than-human dimensions societies face today in dealing with socio-ecological issues (McCall, 2005; Nowotny, 2001; Westberg & Polk, 2016). Such complexity calls for what we think of as 'research-wisdom'. Such wisdom is described by Ravetz as "a sort of knowledge that goes beyond the ordinary. It might be used in response to extraordinary challenges, or to provide special knowledge of the future, or it could even be a sort of reflection on some aspect of the human predicament including knowledge itself" (Ramirez, Ravetz, Sharpe, & Varley, 2019, p. 73).

To approach such a grand aspiration, this research deliberately invokes the co-creation lab where a range of societal actors can engage in the work of thinking through assumptions, exploring possibilities and testing transformative behaviours and action without the expectation that the final result will fix or resolve the issue(s) under examination (Polk, 2015; Puerari et al., 2018). Such knowledge co-creation is partial, often contextual, because as Joosse and her colleagues argue: "the meaning and knowing that is created in collaborative practices does not always make sense outside that specific practice" (Joosse et al., 2020, p. 764). Furthermore, such partial knowledges (knowings) emerge dialogically through the experience of co-creative community involving "the performative and public nature of inquiry" in engaging "narratives that illuminate the present" (Sawyer and Norris, 2021, p. viii) via "harmonic dissonances" (Bliss and Fowler, 2021, p. 152).

The Search for Partial Knowledge

One way to conceptualise the above-mentioned research wisdom is via metaphor. We find this already in Bliss and Fowler (2021) offering us ‘harmonic dissonances’. Similarly, in her work on Alaska’s indigenous and Asian entanglements, Juliana Hu Pegues captures the complexity of space-time colonialism via the poignant metaphors of ‘an (empty) chair’ and a ‘filled ship’ (Hu Pegues, 2021). For the purposes of this paper the researchers turn to the work of Machado de Oliveira (2021) who is offering a pathway to ‘hospicing modernity’, a title which is itself both metaphorical and real. She offers the metaphor of the ‘bus within us’. This metaphor is for the ‘self’, not a unified self but a multiple self in the sense evoked by Deleuze and Guattari (1987) at the opening of ‘A Thousand Plateaus’. This is a multiple self in which there are many voices clamouring for expression. For us the bus is a metaphor for society.

Society is an external version of the self. The society of the bus, filled with passengers (Figure 1), all with issues, agendas and assumptions pulling this way and that. As Machado de Oliveira writes:

“Some of the passengers are at the front of the bus and their voices are loud and well known, some are seated in the middle of the bus and can only be heard at the front in certain occasions, and some are at the back and may even be unknown to the driver(s). Sometimes there is conflict amongst the passengers. Sometimes there are rebellions on the bus and it can be hijacked by rogue passengers. Sometimes the passengers temporarily replace the driver...” (2021, p. 48).

This inner world described by Machado de Oliveira is very much like the world we all know and negotiate each day. This is the world this research seeks to embrace. A world of conflicting needs, values, agendas and ways of knowing. This is a problematic world from the perspective of traditional knowledge production in which there is a singular right and wrong. The co-creation lab sets certainty aside and instead invites multiple ‘voices’ to explore a complex issue. For instance, with carbon farming we can see the bus at work. One of our Mistra EC fellow researchers, Sanna Barrineau, recently blogged⁷ about a workshop in which “farmers running pilot carbon farming projects, food industry representatives, agricultural consultants, and researchers” gathered to discuss future visions for the Swedish food system. Barrineau begins by noting that following the bus metaphor there was a quiet but powerful driver of this bus: the Market!

As Barrineau notes:

“What I then began to feel unsettled by was the lurking presence of ‘the market’ tied to the need to measure soil carbon to persuade the rest of the “value chain” of the virtue of transitioning to regenerative agriculture; the way that some invisible force kept drawing the vibrant conversations back to a “reality” of economic profitability like some black hole, or like a tamer of wild animals, forcing unbridled creativity backwards into the cage where it can do no harm.”

Here she evokes a range of metaphors ‘cages’, ‘wild animals’, ‘black hole’ and so forth to illustrate how the conversation was warped by a shadowy driver who perhaps had really hijacked the bus some time ago. This reflection captures the complexity of the issues faced when trying to engage in constructive environmental communication. In context like this we are forced to ask, who is on the EC Bus (Figure 1)? Who is driving it? And importantly, where is it going? We are also forced to ask, who is sitting in the middle and at the back? Are there empty seats and who or what ‘sits’ in them? Whose voices are lost, or are not represented in all of this?

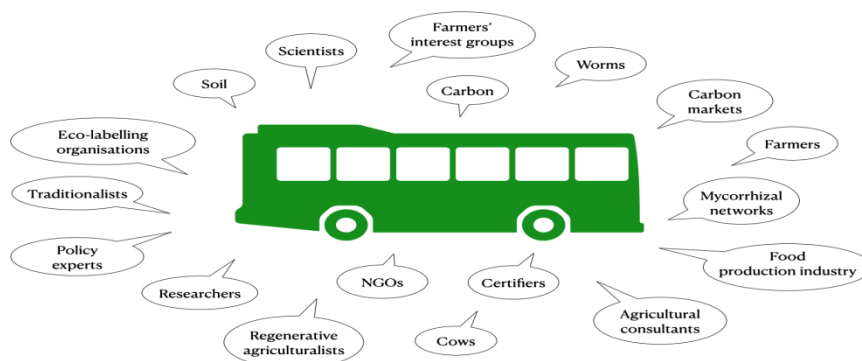


Figure 1: Who is on the EC Bus?

⁷ See <https://www.slu.se/en/subweb/mistra-ec/news/blog-posts/carbon-farming-futures-in-the-making--shifting-from-control-to-care/>

What we are faced with here, as Barrineau notes in her blog, drawing on the work of Nora Bateson (2021), are ‘ecologies of communication’ at work in the definition of what it is possible and not possible to say (and do). Drawing on this concept Barrineau ponders:

“Ecologies of communication affect what we are able to say. The framing of the workshop and the types of questions posed there are all part of the scaffolding of input from participants. However, more importantly for this context, is the backdrop of carbon markets and the promise of calculated futures. Does this allow for communication about non-human life, for example, soil life? About the numerous challenges and priorities of people growing food?”

She goes on to note how the ‘backdrop’ of carbon markets acts as a damper on the conversation. In this she is acknowledging the context as shaping communicative praxis as we noted above. In fact, what this backdrop does is determine boundaries and the centering position of what constitutes ‘the real’ as ‘virtuous’. The metaphor of the bus helps conceptualize the difficulties faced in environmental communication. The term ecologies of communication offer us an additional metaphor for the complexity at work in any communicative field. Reality itself is usually defined by the dominant discourse at work in the context. It legitimizes the status quo and conflates reality with virtue; thus growth, for instance, which is an economic necessity underpinning ‘reality’ in neoliberal discourse, becomes virtuous. The MISTRA co-creation lab is one way to challenge the centrality of such a ‘reality’ by its inclusive and heterodox structure. In this way it allows for increased creativity in the generation of alternatives and the partial knowledge that a transition to sustainable society demands. Thus, the co-creation lab is our EC bus.

Part 2

Conceptualising the MISTRA EC Co-Creation Lab

Essentially, the MISTRA EC Co-Creation Lab explores the research question: *What is the potential of co-creation labs to further environmental communication that stimulates transformative knowledge co-production for sustainability?*

The co-creation labs are designed to facilitate engagement among participants in the lab in a range of case studies whilst simultaneously testing the co-creative possibilities of encounter through various innovative tools and methods. Within the lab, we engage with actors from diverse sectors of society in creative processes of knowledge co-creation. Our interest in establishing a lab responded to the need to create a safe space that allows for creative, inclusive, cross-sector and cross-disciplinary collaborations to navigate wicked situations through exploration and experimentation, and thereby reimagining environmental communication. Furthermore, the lab responded to an urgent need for new modes of science that transcend disciplinary boundaries and sectoral silos to co-create new understandings, framings, and ideas of how to engage with wicked challenges (Tengö et al, 2014).

Our MISTRA EC Co-Creation Lab therefore has the ambition to operate beyond the normal conceptualization of science as a practice for producing research findings to fill defined knowledge gaps in society and communicate them to societal actors (Glavovic et al., 2021; Ravetz, 2011). Importantly, within this setting, the boundaries between academic and non-academic actors become fluid to allow for the interplay of diverse types of knowledge and multiple ways of knowing in order to co-create new insights and approaches for sustainability transformations (Bateson, 2016). Here the dominance of scientific and expert knowledge gives way to the collective reflexivity of those considered as experts, laymen, and those of different social, economic and cultural backgrounds (Sardar, 2010). This is what Funtowicz and Ravetz refers to as ‘post-normal science’ (Funtowicz and Ravetz, 1991). Our lab will be both a physical environment where co-creation can be engaged in a series of transdisciplinary political, economic, and socio-cultural landscapes that function locally and regionally; and a virtual environment to enable wider participation and access from different places. The lab will thus be one without geographical borders, one that can scale beyond a physical space. In this respect, mediums such as webinars, podcasts, and online workshops will be deployed.

As a co-creation space, which puts emphasis on learning, reflexivity and transformation, the MISTRA EC Co-Creation Lab has the following overarching aims to support social transformation for sustainability:

- To co-develop, test and apply innovative co-creation frameworks, tools and methods
- To explore and make use of different kinds of experiences, knowledge and ways of knowing from actors from various disciplines and societal sectors in a creative and safe transdisciplinary space
- To facilitate spaces for new relationships to emerge that empower participants in ways that benefit them in their sustainability work.
- To apply futures thinking, and extended temporal time frames in the co-creation of an anticipatory imagination
- To inspire those who are part of the co-creation process to an anticipatory, ethical and systemic cognizance (a capacity to navigate and sustainably transform wicked situations in their local contexts)
- To critically examine and reflect on knowledge co-creation practices and their potential and challenges in reframing environmental communication and supporting sustainability transformations

- To acknowledge non-privileged positions, and take into account power differentials and conflicts in transdisciplinary research processes

The Mistra EC Co-Creation Lab approach owes much to the work of Ray Ison (Ison, 2017) and his colleagues (Foster, Ison, Blackmore, & Collins, 2019). Their work on systemic inquiry supports the engagement with multiple stakeholders who can hold quite diverse, or even conflicting positions to co-create new understandings and possibilities for action. As Ison explains:

“...systemic inquiry could be conceptualised as a meta-form of purposeful action that, with appropriate praxis and institutional arrangements, could provide a more conducive, systemic setting for programmes, and projects with a diversity of forms of practice and institutional arrangements that are appropriate to the context (i.e. contextualised) e.g. scientific projects; action research projects, systemic action research projects, systemic interventions etc” (bold and italics added; Ison, 2017, p. 254).

Systemic co-inquiry fosters social learning that is intersectional, open ended and evolving (Ison, 2017). It draws on systems theory, methods and techniques in the context of uncertainty (Funtowicz, 1991; Sardar, 2010). Co-inquiry engages systems actors in exploring alternatives, testing ideas and challenging anticipatory assumptions (Miller, 2018). Co-creation labs are transdisciplinary and bring together a range of methods to elicit potential transformative actions explored (brokered) between stakeholders looking for plausible and preferred futures (Facer, 2016; Joosse et al., 2020; Polk, 2015).

It is this flexibility in the process that allows the Mistra EC Co-Creation Lab to function as a space from which new partial knowledges can emerge that potentially bridge previously antagonistic or divergent epistemological positions of stakeholders. Praxis in this context refers to a set of methods and processes deployed by the participants as co-creators that act as specific elements to be applied and tested in a lab (Miller, 2007, 2018).

Institutional arrangements are in place to bring together diverse sets of stakeholders in the co-creation lab from both within government, business and the community with the goal of co-creating knowledge. It is what we could call a community of practice (Wenger, 1998) as captured in the “bus” metaphor described earlier. A community of practice includes actors from various sectors of society who come together in a joint learning process for a wide variety of socio-environmental reasons. These include policy makers, local government project officers, NGOs, private business, community and advocacy groups and so on. The range of disciplinary positions and interests represented by this group are diverse. This community of practice also acknowledges the role of ‘more-than-human’ actors in order to shift the anthropocentric nature of inquiry and obtain a relational understanding of how human worlds are entwined with the “more-than-human” in a process of being together (Bell et al, 2018).

The co-creative dimension of the co-creation lab sits in a tangle, a Deleuzian ‘assemblage’ of mixed methods/disciplines (Deleuze & Guattari, 1987). The commitment in such contexts is to the relationships and co-created ways of understanding possible pathways around socio-ecological issues that frame the environmental communication debate.

Another central element to the Co-Creation Lab is futures thinking (Slaughter and Bussey, 2005), which seeks to enable individuals and organizations to better understand the processes of change so that desirable futures can be created. It helps challenge our existing assumptions and create the conditions for a paradigm shift, i.e., when new futures are imagined, preferred futures identified, new strategies created then stakeholders feel empowered and ready to work towards new futures previously excluded from their suit of ‘legitimate’, ‘realistic’ or ‘sensible’ choices. In this way new futures emerge (Inayatullah, 2008).

Methods and Tools

Work with the Mistra EC Co-Creation Lab has already begun. The lab involves participants iteratively over several months using a range of co-creative tools that include (but not restricted to) CLA, Co-Creative (Serious) Games and Scenario planning. As the objective of the lab is to develop and test ideas and potential ways to engage with wicked problems, methods have been chosen that have the capacity to improve dialogue, stimulate “thinking outside the box”, and facilitate deeper connections and meaningful collaborations across disciplines, sectors and stakeholder groups. In broad terms the methods listed here, and detailed below, have been selected as they are deemed appropriate for transdisciplinary research based on systemic co-inquiry. They include the following:

- **Causal Layered Analysis** (S. Inayatullah, and Milojević, Ivana, 2015)
- **Scenario workshops** (futures persona; thing from the future; etc...) (Bezold, 2010; Candy, 2018; Candy & Watson, 2015; Fergnani, 2019)
- **Serious games** (Dörner, Göbel, Effelsberg, & Wiemeyer, 2016)
- Photo voice and photo elicitation (Baldwin & Chandler, 2010; Holdaway, 2020)
- Futures wheel (Bengston, 2016; Glenn, 2009)
- Anticipatory Action Research (AAR) (S. Inayatullah, 2007; Stevenson, 2002).

CLA is an established workshop method in futures-oriented research and practice (S. Inayatullah, and Milojević, Ivana, 2015). It is a critical futures tool that enables participants to explore deeper layers of understanding, through processes of questioning, deconstruction and distancing at various levels of reality. It has the added benefit of making intelligible the roots of conflicts and tensions in a safe way that generates a third space for understanding and dialogue.

Similarly, co-creative game design also works in this third space (Rusch, 2020). As one of us – Thao Do – has argued:

“Co-creative game design can not only create a safe space for exploration and experimentation, but also to some degree dismantle knowledge hierarchies and foster a level playing field to embrace multiple ways of knowing. Here, every stakeholder as co-designer/player is empowered to act in an inconsequential space, where power differentials, dominating structures and norms are challenged. This opens up opportunities to “think outside the box” and co-create innovation that can potentially transcend the business-as-usual trap” (Do, 2021)⁸.

Co-Creation Labs in Action: Two Snapshots

Snapshot 1: Co-Created Game Labs

This process is now underway. We have initiated an iterative game co-design process together with carbon farming stakeholders, including two online focus group meetings and two in-person game co-design workshops at the time of the publication of this paper. While one aim is to build a game prototype, it is the process of prototyping which is in focus. The purpose of this particular co-design process is to develop transformational pathways that lead to the sequestration of carbon but also the other co-benefits towards a multifunctional agricultural system.

In the game, stakeholders must sequester as much carbon as possible while navigating the realities of socio-ecological systems. In the **first workshop**, stakeholders worked to develop different transformational pathways and other elements (e.g. actions and shocks or system disruptions) to the game, creating the beginnings of a dynamic system through rich pictures and inspiration cards with photos [Image 1]. Rich pictures use drawings to represent complex situations or concepts (Checkland & Scholes, 1990) and was used to allow the stakeholders to illustrate how they saw the so-called ‘playing field’ of carbon farming as they currently experience it and share that with the group. The **second workshop** engaged stakeholders in game play of the first prototype, built on the outputs of the first meetings and the creative capacities of our game design colleague. A ‘multifunctional knot’ was a metaphor expressed by one stakeholder during the first workshop, illustrating the intrinsic entanglement of human and non-human actors and the challenge of finding a single pathway that may clearly lead to a equitable outcome for all.

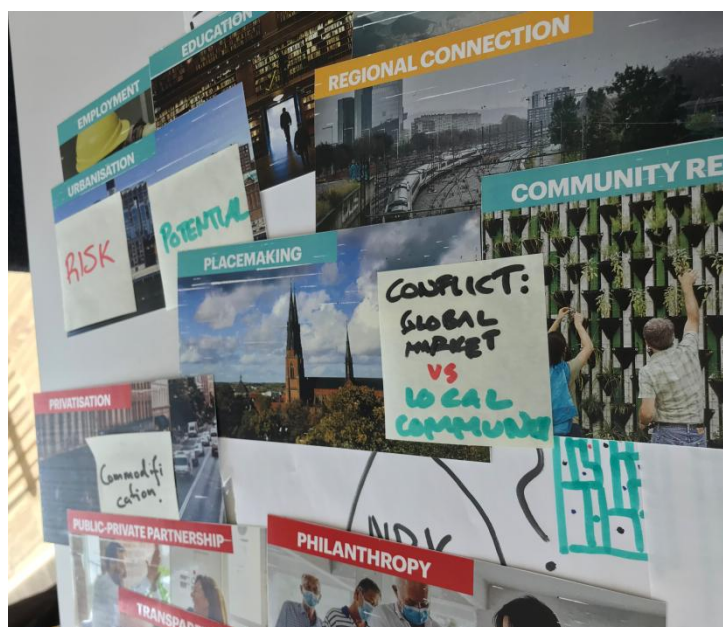


Image 1: Inspiration cards as part of the first co-design workshop. Photo credit: Sanna Barrineau

The use of CLA and co-creative game design works effectively with the generation of scenarios. Scenarios are thinking tools that are developed under sandbox conditions to test probable, possible and preferable futures (Chermack, 2004; Mayo, Osborne, Bussey, & Burns, 2021). As a critical futures tool scenarios allow participants in this study to create distance between themselves and the realities that form understanding and suppress alternatives. As such, all three methods work to – as Foucault (2002) would have it – become a little less governed by the present.

⁸ See full text at <https://www.slu.se/en/subweb/mistra-ec/news/blog-posts/co-creative-game-design--an-emergent-and-exploratory-space-for-co-producing-knowledge/>

Snapshot 2: Farm Visits

Labs occur anywhere. So walking the fields of a pilot farm trialling carbon farming techniques becomes a ‘lab’. In this way we aim to trace an ecology of communication emerging through the co-production of the multiple ‘voices’ on site. Here we are using images (photo voice) taken by participants along with narratives and the exploration of meanings such as what they evoke. In testing soils in a field for instance, stakeholders engage with different ‘voices’ (worms, microbes, humus, minerals, etc) to make sense of soil health and corresponding sequestration potential [Image 2]. The variety of evidence available through this testing multiplies what it is possible to ‘say’ in this context, but also highlights the corresponding challenges of linear communication about ‘what is going on’ in terms of soil carbon sequestration.

Here, evidence emerges from partial knowledge – the dynamic performance of farmers, soil life, cows, shovels, carbon brokers, metric rulers, water, and clovers. Making sense of the present and potential futures emerging *in situ* is a co-construction of the ongoing relational processes around the actions taken to understand what is going on in soils. Photo voice enables farmers and others to construct narratives around what they know and do not know. The co-creation labs allow them to share these images and narratives with others to increase the co-productive potential of research and engagement between stakeholders.



Image 2: Soil testing at a carbon farming pilot site. Photo credit: Sanna Barrineau

Both the gaming and farm walk methods are open and inclusive, and each elicits the co-creative learning potential of participants. They sit well within the overall methodological approach of this research which is characterized by systemic co-inquiry, i.e. stakeholders are considered as co-researchers who contribute to the design, implementation and evaluation of the research (Foster et al., 2019; Ison, 2017). We need a wide variety of entry points when exploring co-creative communication for sustainability. One way to think of this is as developing strategies that foster ‘intercultural competence’ (Fraser & Schalley, 2009). Such competence comes to the fore in co-creation labs where all are encouraged to share from their contexts, which are essentially cultures of knowing and doing.

Conclusions

Much remains to be done in this space but the research is off to a start with the Mistra EC Co-Creation Lab being run or scheduled to run in relation to e.g., carbon farming, eco-burials and forest fires. As noted above, the research occurs in the context of a communicative break down that has led Glavovic and colleagues (Glavovic et al., 2021) to suggest the science-society contract has been broken. We argue that such a breakdown is perhaps more in relation to a specific kind of authority, characteristic of modernity’s privileging of science as a tool for control and management of the natural world, rather than more broadly. We are committed to the science-society contract but recognise that we are engaging research wisdom in the face of complexity and uncertainty (Ramirez et al., 2019).

In this, we link our research with activism and advocacy (Weiss, 1991), noting that this link is very important as *we are researching in order to advocate for more effective forms of communication and engagement*. Such work involves a sensitivity to transcontextuality, a good dose of humility, is explicitly mission driven and open to partial knowledge. The Mistra EC Co-Creation Lab is conceptually built on the metaphor of the bus (figure 1; Machado de Oliveira 2021). The research ambition is to bring into the co-creative process the multiple stakeholders, the human and more-than-human, who all hold part of the solution to our societal challenges.

In summary, our goals as mapped out in the MISTRA EC research statement can be broken down into the theoretical and practical levels. They include the following:

Theoretically we wish to:

- Demonstrate the utility of learning labs in tackling ‘wicked problems’
- Promote transdisciplinary approaches to knowledge co-creation
- Stimulate conceptual renewal on ‘what environmental communication means, and how it can lead to socially inclusive and democratically legitimate’ (MISTRA EC 2019, p. 6)
- Demonstrate the relevance of multi-actor dialogue to environmental communication research, and
- Test the co-creation lab as a site of emerging communicative ecologies

At the practical level we aim to:

- Test and develop the co-creation learning lab model in a variety of settings
- Promote the models and methods used in the research through formal and informal channels
- Enable participants as co-researchers to achieve greater understanding of the ‘wicked problems’ they face
- Equip environmental actors with ‘theoretically informed models and tools for communication and [foster in them] the capacity to critically reflect upon and adapt activities to the situation at hand’ (MISTRA EC 2019, p. 6).

Ultimately, the co-creation lab represents our strategic attempt to strengthen transdisciplinary inquiry, enabling researchers and various actors in society to engage in processes of co-creating knowledge and practice in order to develop responses that go beyond business-as-usual in the face of increasingly complex situations. Moreover, it is an attempt to transform the traditional approach to science and research to truly embrace diverse knowledge systems and multiple ways of knowing in a joint learning process for bringing about changes.

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