

Eva Bubla

ART AS A CATALYST

Artistic Strategies for Ecological Attentiveness and Future-making

DLA (PhD-in-Practice) Dissertation
Hungarian University of Fine Arts
2026

Supervisor:
dr. Habil. Varga Tünde Mariann PhD
(Hungarian University of Fine Arts)

Acknowledgements

I would like to express my utmost gratitude to Tünde Varga, for her professional guidance as my supervisor;

Zsuzsa Millei and members of the Microbial Childhood Collaboratory, for bringing new perspectives and insights into my practice;

Fanni Nánay and the In Situ network, for the enriching experiences of working in public space in a European context;

all the artists, scientists, theorists, planetary healthcare advisors, human and non-human beings who I collaborated with or who contributed in any way to my work and development as an artist;

my family, who created the possibility for my education and as such, my explorations;

as well as my curiosity, and ability to constantly redefine my practice across disciplines and contexts.

Abstract

ENG

The socio-ecological challenges of our time have questioned the roles and responsibilities of artists and cultural practitioners. Several artists have approached current issues by imagining new ways of being and acting in the world, seeking to foster social transformation, shifts in values, changes in environmental issues, or a crucial system change. Is art truly capable of making a difference? How can art catalyze a change? Through case studies of the author's artistic and curatorial practice alongside relevant contemporary practices, this dissertation investigates the catalytic potential of art and the ways in which artistic practices can engage audiences with urgent ecological issues, cultivate ecological attentiveness, reconfigure human–more-than-human relations, and generate new future imaginaries. Particular attention is given to public space, audience participation, multisensory experience, futuring, and interdisciplinary collaboration as ways of creating dialogue, collective learning, and encounters with ecological interdependencies. Drawing on theories of participatory art, ecological thought, posthuman and relational ontologies, multispecies care, and biosocial approaches informed by microbiome science, the research examines art as a form of ecological inquiry and knowledge production. It considers practices of participation, speculation and experimentation, including the development of future ecologies as a way of imagining and rehearsing alternative forms of coexistence. The dissertation argues that art can move beyond the representation or communication of ecological issues to function as a catalyst for change: transforming perception and attentiveness, fostering care and new ecological imaginaries, and creating conditions for alternative forms of action that may contribute to longer-term social and ecological transformation.

Egy élhetőbb jövő alternatívájának megteremtése, környezettudatosság, társadalmi átalakulás és értékváltás, a fenntarthatatlan rendszerekből való elmozdulás: ideák, melyek korunk társadalmi és ökológia kihívásainak ismeretében számos művész, művészcsoport és kollektíva munkájának kiindulópontjaként szolgálnak. Mi szükséges azonban ahhoz, hogy e víziókat tartalommal és potenciállal töltsük meg? Hogyan képes a művészet változást előidézni? A disszertáció a szerző művészeti és kurátori praxisán, valamint releváns kortárs művészeti gyakorlatok esettanulmányain keresztül a művészet katalizáló, változást előidéző lehetőségeit vizsgálja: azt, hogy a művészeti gyakorlat miként irányíthatja a figyelmet sürgető ökológiai kérdésekre, hogyan alakíthatja át az emberi és a több-mint-emberi világ viszonyának érzékelését és értelmezését, és miként nyithat teret új jövőképek és együttélési formák számára. A kutatás különös figyelmet fordít a köztéri és részvételi művészeti gyakorlatokra, a több érzékszervet bevonó tapasztalásra és a különböző tudományterületek közötti együttműködésre mint a párbeszéd, a közös tanulás és az ökológiai összefüggések megtapasztalásának lehetőségeire. A részvételiségre, az ökológiai gondolkodásra, a poszthumán és relációs ontológiákra, a többfajú gondoskodás elméleteire, valamint a mikrobiomkutatásból kiinduló bioszociális szemléletre támaszkodva a kutatás a művészetet nem pusztán az ökológiai kérdések megjelenítésének vagy közvetítésének eszközeként, hanem az ökológiai összefüggések feltárásának, megtapasztalásának és a tudás létrehozásának egyik módjaként értelmezi. Olyan részvételi, spekulatív és kísérleti gyakorlatokat vizsgál, amelyek lehetséges jövőket és az együttélés alternatív formáit képzelik el, és spekulatív helyzeteken keresztül a jelenben is megtapasztalhatóvá teszik azokat. A disszertáció mellett érvel, hogy a művészet túlmutathat az ökológiai problémák reprezentációján és kommunikációján, és a változás katalizátoraként működhet: alakíthatja érzékelésünket és figyelmünket, elősegítheti a gondoskodás új formáinak kialakulását és új ökológiai képzeleteket hívhat életre, valamint olyan helyzeteket teremthet, amelyek új döntési és cselekvési lehetőségeket nyitnak meg. E folyamatok hosszabb távon hozzájárulhatnak az ökológiai kérdésekhez való viszonyunk, az ezekkel kapcsolatos döntéseink és végső soron cselekvéseink megváltozásához.

Citation

Bubla, É. (2026). *Art as a Catalyst: Artistic Strategies for Ecological Attentiveness and Future-making*. Doctoral dissertation, Hungarian University of Fine Arts, Doctoral School.

Copyright ©2026 Eva Bubla

Acknowledgments	I
Abstract	II
Table of contents	IV
 1 INTRODUCTION	 1
1.1 The Terrain: Art in Times of the Ecological Crisis	1
1.2 The Compass: Cultural Horizons, Personal Motivations	3
1.3 Research Methodology	8
 2 SENSING AND MAKING SENSE OF THE WORLD(S) WE LIVE IN	 10
2.1 Reimagining Public Spaces. Citizen Engagement as a Form of Ecological Activism	11
2.2 Case Study: SENSING THE CITY	24
2.2.1 Curatorial Concept and Principles. Sensing as a Method	25
2.2.2 Artist as a Curator	27
2.2.3 SENSING THE CITY 2021-2025	29
2.2.4 Lessons and Reflections	43
 3 MORE-THAN-HUMAN ECOLOGIES	 46
3.1 Reimagining Relations Across Spaces and Species	46
3.2 Case Study: Gudebergjordet Protection Agency	51
3.3.1 Resting with the Land - A Relational Experiment	52
3.3.2 Gudebergjordet Protection Agency	55
 4 FUTURE ECOLOGIES	 61
4.1 Reimagining Futures	61
4.2 Case study: Microbial Futures Lab	67
4.2.1 Microbial Futures and Imaginations: Designing a Future Medicine as an Art & Science Experiment	72
4.2.2 The Future Medicine Workshop as a Method	79
4.2.3 Opening to the Public: Building a Network of Planetary Healthcare Advisors	81
4.2.4 Future Implications: From Speculation to Implementation	94
 5 CONCLUSIONS	 100
 References	 104
List of images	116
Appendix	121

1 INTRODUCTION

1.1 The Terrain: Art in Times of the Ecological Crisis

Dripping *chapopote*¹ from paintings of landscapes; exhibiting carbon ruins for a post-fossil society; changing the temperature of a museum by 2°C, and using saved costs for purchasing and protecting a rainforest area; monitoring water quality by clam-shaped kinetic sound sculptures; hiding scents of alien plant species in the local flora; amplifying sounds of compost worms rhythmically breaking down the hidden world below; transmitting messages using a forest alphabet; growing the portrait of the Indian prime minister and an agrarian message to him from leafy vegetables² – actions that represent a selection of artistic interventions that, through varying mediums and methodologies, address the pressing ecological concerns and planetary crisis of our times.

The continuous damage to our environment caused by anthropogenic pollution is leading us towards a climate catastrophe. Unsustainable human practices, urbanization and habitat loss, extractivism and the illusion of unlimited growth, violations of the rights of various species are at an unprecedented rate. Sadly, the situation is set to deteriorate further as we ignore planetary boundaries and approach multiple climate tipping points. This change to the environment, driven by industrial modernity that traces back to the development of capitalism long before, poses risks of rising temperatures and severe weather occurrences, alteration of extreme droughts and flooding, biodiversity loss, declining crop yields, devastating wildfires, desertification, mass species extinction, and the crisis of public health with an increased number of epidemics. Almost four decades have passed since the Brundtland Report (WCED, 1987) that was seeking to respond to growing concern about environmental degradation and the use and exploitation of “resources”³ without negatively affecting the needs of future generations. It has been more than thirty years since the 1992 Rio Earth Summit, the first in a series of international climate negotiations sponsored by the UN, tasked with identifying strategies to stabilize atmospheric greenhouse gas concentrations at levels that would prevent significant disruption of the Earth’s climate system. The meetings were initiated shortly after NASA climatologist James Hansen’s landmark testimony in the US Senate (1988), in which he attributed the record-breaking temperatures of the year not to natural climatic variability, but to the increase of human-generated atmospheric pollutants (Demos, 2016, p. 8-9). Despite the urgency clearly articulated at that moment, global greenhouse gas emissions have roughly doubled since.⁴ The Rio Summit introduced the now widely accepted principle of “common but differing responsibilities,” acknowledging the unequal contributions and capacities of

¹ tar

² In the order of appearance: Minerva Cuevas: Hydrocarbons Series (2007-); Climaginaires: Carbon Ruins (2019-); Tue Greenfort: Exceeding 2°C (2007/2014); Marco Barotti: Clams (2019); Raimo Saarinen: Invasive Scent (2025); Tamara Henderson: Worm Affair (2025); Katie Holten: Learning to Be Better Lovers (2025); Gram Art Project: Grow In India (2016)

³ Nature should not be regarded as a mere resource because reducing it to an object of extraction obscures the complex, interdependent relationships that sustain life, positioning humans as separate from—and dominant over—the very systems they fundamentally depend on.

⁴ Global CO₂ emissions increased from 22.08 billion metric tons in 1988 to a projected 38.11 billion metric tons in 2025 (Statista Research Department, 2026).

industrialized and developing nations—the Global North and the Global South—in addressing climate change. Nevertheless, subsequent UN climate negotiations, including the annual Conferences of the Parties (COP), have largely failed to produce binding agreements or decisive governmental leadership capable of meaningfully curbing emissions. Although these forums routinely affirm commitments to prevent global temperature rise from exceeding 2°C compared to pre-industrial levels, such pledges and signed agreements have remained largely symbolic and ineffective in practice. The persistent failure reflects the structural dominance of corporate and economic interests that prioritize short-term profit over long-term ecological sustainability. Within this paradigm, free-market ideology continues to prevail, even as it undermines the planet’s capacity to sustain life, effectively constraining meaningful climate action and perpetuating environmental degradation (Demos, 2016, p. 10).

At the same time, a growing number of artists and cultural workers are committed to addressing environmental concerns and the ecological crisis of our time. Several projects propose experimental models for ecological sustainability and imagine new ways of thinking, being and acting in the world. Contemporary positions of artistic practice essentially differ from past varieties, though.

Since the 1960’s, there have been numerous attempts in both art practices and discourse to challenge the dominant—Western—conception of art which is “identified with salable objects rather than with kinds of behaviour or ways of doing that embellish and enlarge life” (Gablik, 1995, p. 41), including the emergence of eco-artistic languages. Contemporary practices tend to avoid their now-inadequate elements, though, particularly the romanticized longing to return to a lost unalienated relationship with nature—and the very idea of the Cartesian dualism of human and nature—, or the dominance of the aesthetic dimension rather than the ethical-political (Morton, 2007, p. 23). As Demos (2016, p. 13) argues, “contemporary artists are connecting to and building upon past approaches of institutional critique, documentary fictions and multispecies assemblages [...and...] the most adventurous practitioners are also pushing beyond those earlier precedents—for instance analyzing the political ecologies and economies of art institutions (as well as liberating existing institutions or even inventing whole new models [...]); joining the speculative fictions of video-essay making to politico-environmental imaginaries; and growing linkages between permaculture farming, experimental social relationships, and post-anthropocentric modalities of belonging.” In these works, we experience an enactment of “intersectional⁵ politics of aesthetics” (Demos, 2016, p. 13), where art places less emphasis on the traditional gallery-based experience of aesthetic reflection and instead evolves in close relation to field research, creative or critical pedagogies, political activism, and partnerships within civil society, where interdisciplinary collaboration reflects the intricate dynamics of political ecology.

⁵ The term *intersectionality* was originally coined by Kimberlé Crenshaw in 1989 as a reaction to both white feminism and the then male-dominated Black liberation movement, which failed to address the multi-layered discrimination of Black women. It is used as an analytical framework for understanding how the social and political identities of individuals and groups create unique combinations of discrimination and privilege due to intersecting and overlapping factors such as gender, caste, sex, race, ethnicity, class, sexuality, religion, disability, physical appearance, and age; aspects that can lead to both empowerment and oppression (Crenshaw, 2006).

“If a Green Revolution is to happen,” explains activists and literature professor Nicholas Powers (cited in Demos, 2016, p. 18), “we have to switch from apocalyptic imagery to utopian prophecy, to create a cultural wilding that opens horizontal spaces into which people can enter and join the carnival.” I firmly believe that art, given its experimental nature, imaginative capacities and subtle critical tools can play a transformative role here, shaping what Spivak calls the social imagination (as cited in Varga, 2019, p. 78). As curator Carmen Salas (2020) notes, “art is intimacy and inspiration.” Invitation for new perceptions, perspectives, philosophies, or a call to action. Not only does it reshape the physical environments in which it unfolds, but it also affects those who encounter it. It reaches far beyond the production or exhibition of material objects or digital experiences; it proposes a mode of relating to the world—informing how individuals orient, organize, and give form to their lives, as well as how they cultivate practices of care for themselves, for others, and for the environments they inhabit.

In the context of our planetary urgencies, I keep asking the questions: how can we best seize this potential of art? Why and how should we make art? What and who should we address, represent or engage? What roles should we take? What are the best formats and strategies? How can we trigger transformation, a shift in values, attitudes and actions, contribute to a turn in environmental, ecological issues, or bring about a crucial system change? Is art truly capable of making a difference? *How can art catalyze a change?*

My research departs from these questions, and experiments with various artistic strategies and positions to unfold possible answers. The present doctoral thesis aims to offer a critical analysis of these experimentations, their actual and possible effects, the concepts, knowledges, attentiveness and kinds of futures they generate.

1.2 The Compass: Cultural Horizons, Personal Motivations

In order to position the research, it is necessary to briefly outline where it emerges from and to clarify the motivations that continue to orient it. The research questions and issues addressed here did not arise suddenly or in isolation, but developed organically through encounters with specific places, contexts, urgencies, communities, and modes of working. In this respect, my artistic thinking and practice have been greatly influenced by the approaches present in Indonesian contemporary art, since I lived and worked in the region between 2011–2016. Not only did I experience the uneven consequences of the climate crisis in the Global South, and the effects of unsustainable human practices and environmental degradation on my own skin, but I also had the privilege to work closely with the cultural and civil sector and familiarize myself with the methodologies they use to address these problems. Therefore, when observing *art as a catalyst*, contemporary art practices of Indonesia—mostly Yogyakarta—and the region in general have served as a great source of inspiration.

The collectivist mindset⁶ characteristic of the region still exists in the arts as well, both in the attitudes of individual artists and in the shared vision of artist collectives. As Gustaff Harriman Iskandar explains, artists have a social function, “relating to the *dharm*⁷, the contribution to society. They are not seen in the individual domain but always seen in a social context.” (Ostendorf, 2017, p. 27) As it crystallized from the collaborations I have had and the interviews I have undertaken with local cultural practitioners, artists are expected to take moral responsibility for the society they belong to, have a sensibility to social issues, and guarantee the integrity of their work while being conscious of the impact it has on the physical or social environment. This can be rooted back to the tradition of *gotong-royong*⁸ or “working together,” a philosophy that still permeates Indonesian society today, and in this case, it is the artist who is in charge of the community. This status is a tool in the hand that can be used to lead, facilitate, influence, show models and offer alternatives, but at the same time it also requires the artist to be aware of the needs and aspirations of the community and set goals accordingly, not abusing the power (Bubla, 2022).

Artist collectives as citizen initiatives are often even more directly engaged in social or environmental issues, driven by a desire to address or tackle them through creative practices. They can be understood as means and strategic units to deal with a number of socio-ecological issues, where members and collaborators come from a great variety of backgrounds—art, design, architecture, or the sciences. Projects like *Soya C(o)u(l)ture* (2015–) of Xxlab (HONF) have targeted to tackle water pollution and poverty in Indonesia by using programmable bacteria and tissue culture to turn soya liquid waste into edible cellulose, biofuel and bio leather (Sick-Leitner, 2015, see Fig. 1), and related art&design objects. The [*Jogja River Project*](#) (2011–) of Lifepatch has observed and identified problems around water pollution by community engagement and data mapping for almost two decades (see Fig. 2). Ketemu’s [*Our Lake of Imagination*](#) (2015) mobilized elementary school students to become positive agents of change for their environment by facilitating workshops that address the water hyacinth infestation of Lake Batur, caused by chemical fertilisers from surrounding farms (see Fig. 3). The collective also initiated the foundation of the first psychosocial rehabilitation center in Indonesia that harnesses art for mental well-being, and incorporates creative processes into community art expression, public education and advocacy programs. Serrum’s [*Pasar Ilmu*](#) (*Knowledge Market*, 2015–) has created an experimental, performative space for learning through the random pairing of participants with different forms of

⁶ The strong presence of collectivism in Indonesian society is caused by a combination of historical, social, and political factors (Beard and Dasgupta, 2006). An easily observable example is the organizational and formal structure, management of residential areas, known as *kampung* in Indonesian. The literal translation of *kampung* is village, but it does not necessarily refer to a rural environment; larger cities and metropolises also consist of *kampungs* with strict administrative structures. Within a *kampung*, 30-50 houses are usually organized into a *rukun tetangga* (RT), which can be roughly translated as “neighborhood association.” Each RT is led by a collectively elected member of the residents (Pak RT, where Pak means man), who has no formal political power or position, but is responsible for the area and its security, and the representation of the interests of the community. He registers each new tenant of the neighbourhood, organizes the volunteer night patrol (*ronda*) around the *kampung*, as well as occasional garbage collection, all of which take the form of local community work (*gotong-royong*).

⁷ Dharma here refers to an individual's moral responsibilities or duties.

⁸ Gotong-royong is an essential element of the Indonesian philosophy, manifesting itself in many forms ranging from working together on agricultural activities to helping at social events like weddings or other ceremonies, contributing by food or energy which will be later given back in return (tolong-menolong), or building roads, bridges and houses for a public interest (*kerja bakti*) (Julaikha & Bahri, 2014).

expertise, previously unknown to each other, bringing into dialogue forms of expert and local socio-ecological knowledge that cannot be acquired within traditional educational frameworks (see Fig. 4). Collectives such as Survive Garage or Grafis Huru Hara have been dedicated to activate locals using printmaking activities; the latter researching alternative materials that could make this technique more accessible and cost-effective for a wider audience, which led them to experiment with Tetra Pak as a substitute for the much more expensive copper or aluminum plates. Projects of ruangrupa address urban contemporary issues through exhibitions, festivals, art labs, films, magazines, culminating in the creation of *Gudskul* (2018-), a public learning space established to practice an expanded understanding of collective values, such as equality, sharing, solidarity, friendship and togetherness; just to give a few examples. Ostendorf (2017) identifies various approaches that characterize the work of these artists and collectives, namely, the existence of alternative (art) education where DIY and DIWO methods are applied, the use of low-tech practices of a traditional or non-mechanical kind that require inexpensive and widely available materials often referred to as hacking or making, building on social engagement, local leadership and the bottom-up or grassroots approach, re-commoning the commons, and reviving local or so-called indigenous wisdom and practices.

However, it is particularly important to note that these concepts and terms can only serve as an interpretative framework derived from the terminology of the West. As Gesyada Annisa Namora Siregar, a Jakarta-based curator and member of Gudskul emphasized (2022), terms often used to describe their activities, such as participatory art, community art, or socially engaged art, are heavily loaded and, in the Indonesian context, inaccurate Western concepts, as they fail to recognize the all-encompassing and defining spirit of collectivism. Artistic practices related to communities and the society are not genre-specific, but rather a fundamental position.

This mindset is not alien to other nations and cultural workers in the region either. There are several artists, collectives and cultural organizations in India and the aboriginal Taiwan—countries where I lived and worked later on—that follow similar methodologies, building on local knowledge, collectivist values and philosophies. The concept of gotong-royong appears in the aboriginal Taiwan as well (mostly in Amis/Pangcah indigenous communities), called *mipaliw*, shaping the local art scene.



Figure 1. *Xxlab: Soya C(o)u(l)ture*. 2015. Ars Electronica, Linz, Austria. Photo: Florian Voggeneder



Figure 2. *Lifepatch: Jogja River Project*. 2014. Yogyakarta, Indonesia. Image source: artist's website



Figure 3. Ketemu: Danau Imajinasi Kami (Our Lake of Imagination). 2015. Lake Batur, Indonesia. Image source: artist's website



Figure 4. Serrum: Pasar Ilmu (Knowledge Market). 2021. Yamaguchi Center for Arts and Media (YCAM), Japan. Photo: Yasuhiro Tani

These influences re-oriented my artistic interest and methodologies as well, leading me to redefine my practice⁹; and later, to carry out the present research. Comparing the practices of the region and the ones of my own culture is no purpose of this paper, though. Rather, what interested me most is how, upon returning home, I could integrate this experience and my altered artistic identity, and reposition myself and my ecological artistic practice in a European context. For this very reason, I decided to delve into a predominantly experimental, empirical research process.

1.3 Research Methodology

The methodological framework of this research is rooted in *artistic research*,¹⁰ understood as a process of generating knowledge through creative practice, reflection, and embodied experience; a fluid, constant exchange between making and theorizing (Varga, 2013, p. 33-34). As a transdisciplinary and non-hierarchical, hybrid practice, it operates at the intersection of art, ecology, public engagement, and activism. It is process-based, open-ended, and situated—in this sense, it does not aim to “prove” but rather to explore and unfold, testing the potential of art as a catalyst for developing ecological literacy and attentiveness, and to illuminate possible futures (Ernst Bloch, as cited in Becker, 2012, p. 68).

The methodology leans on both *practice-based* and *practice-led* components.¹¹ On the one hand, my artistic-curatorial practice—solo, collaborative and collective—functions as a site of inquiry, a means to experiment with and refine ecologically focused, participatory artistic strategies. On the other hand, theoretical reflection and contextual analysis offer the foundational framework to comprehend these experiments in relation to broader discourses of art and ecology, participation, activism, futuring, and artistic knowledge production. In both cases, artistic processes function as epistemic acts rather than as mere outcomes.

Primary sources of data include the artistic projects themselves, which are analyzed as case studies demonstrating various models of engagement and activation; my own research notes

⁹ Direct encounters with local environmental challenges—including plastic and water pollution, agricultural practices, and human impacts on ecosystems—gradually shifted the focus of my work towards ecological questions. During this period, I began developing installations and participatory projects that sought not only to reflect on these issues but also to engage local communities in experiencing, discussing, and collectively responding to them. These early experiments laid the groundwork for the ecological and socially engaged artistic methodologies developed later in Europe.

¹⁰While I am not unfamiliar with working in art-based research environments, this research deliberately situates itself within the field of artistic research due to their fundamentally different epistemological orientations. Art-based research typically employs artistic methods—such as drawing, storytelling, performance, or visual artefacts—as means of collecting, interpreting, or communicating knowledge, particularly within established fields such as social science, education, or environmental studies (Barone & Eisner, 2012: 1–3). In this sense, artistic methods may serve as instruments within an inquiry whose broader methodological framework remains grounded in another academic discipline. Michelkevičius (2018: 266–267) distinguishes this approach from artistic research, in which artistic practice itself constitutes a site of research and knowledge production. This distinction resonates with the broader understanding of artistic research as research conducted *through* and *with* art, where artistic practice is not merely a means of illustrating or disseminating knowledge but participates in the formulation of the research questions and the production of knowledge itself (Borgdorff, 2012: 44–45). Artistic processes are therefore not subordinate to theoretical inquiry; rather, artistic thinking, experimentation, and making constitute critical epistemic practices through which knowledge can emerge (Bolt, 2013: 7–8).

¹¹ Practice-based research results in an artistic artifact accompanied by reflective analysis, while practice-led research prioritizes the generation of new insights, questions, or methodologies through practice itself (Candy & Edmonds, 2018, p. 65)

and reflections, as well as interviews with artists, scientists and other experts, and reviews of audience/participant experience; and last but not least, theoretical reflection and writing, which synthesize insights from post-humanism, decolonial studies, environmental humanities, political ecology, new materialism, agential realism, as well as theories of embodied cognition.

The research process follows a cyclical structure, reflecting the in-flux nature of both ecological systems and artistic practice. This approach facilitates ongoing interaction between theoretical insights and hands-on experimentation, guaranteeing that the research stays adaptable to emerging questions and contexts.

While I refer to some external projects, my artistic research and dissertation do not intend to give an exhausting overview on Hungarian or international practices of ecological art, but rather to carry out an empirical research and experiment using my own artistic—and curatorial—practice to come to conclusions about the themes and strategies observed and tested. As such, the discussion is dominated by the case studies of my own projects and collaborations that were carried out along the years of the doctoral program.¹² The external examples discussed in the present thesis focus primarily on contemporary artists whose work I have experienced myself or identify with, with a few exceptions of artists or projects who were pioneering in the context of my research. This approach allows for an empirical exploration of my research interest.

Chapter **Sensing And Making Sense Of The World(s) We Live In** focuses on the activist potential of artistic interventions in public space, possible ways of public engagement, taking my curatorial project SENSING THE CITY as a case study. Chapter **More-Than-Human Ecologies** investigates how artistic practices may give form to multispecies modes of relation, care, and world-making, using the example of the artistic research process related to project Gudebergjordet Protection Agency. The last chapter, **Future Ecologies** scrutinizes the future-making potential of artistic practices through the case study of a multidisciplinary collaboration and participatory artwork Microbial Futures Lab. Naturally, the topics of the separate chapters are inherently interrelated and oftentimes overlap, but there has been a conscious choice of exploring them from different angles. The concluding chapter brings these three strands together to articulate the understanding of art as a catalyst and consider how the shifts initiated through artistic practice may contribute to ecological transformation.

¹² Due to character limits, I had to curb the number of projects presented in my dissertation that were carried out during my doctoral studies.

2 SENSING AND MAKING SENSE OF THE WORLD(S) WE LIVE IN

Our media is flooded by news on our changing climate and the degradation of our ecological systems. Melting icebergs in the Arctic. Rising sea levels from the Pacific to the Baltics. Oceans suffocated in plastic. The Beijing sun hidden behind pollution. Shrinking rainforests along the Equator. Wildfires across Australia. Species going extinct. Devastating landslides in South-East Asia. Record heat waves across Europe. Increasing water shortages. The desertification of the Hungarian Great Plains. Just some of the recent events sweeping across our globe. These crises are no longer distant projections and scientific predictions only, but are shaping our everyday experiences. There is not a single corner of our planet unaffected to some extent by climate change and environmental degradation, increasing the instability of ecosystems and the vulnerability of both human and more-than-human life. And yet, despite the proximity and the constant, oftentimes even overwhelming circulation of environmental information, many people oscillate between fatigue and paralysis. For some, it produces indifference or avoidance; for others, anxiety¹³ and a sense of helplessness.

The question of responsibility further complicates the matter. Environmental degradation cannot be reduced to individual lifestyle choices alone. It is entangled with corporate interests, governmental policies, global supply chains, and historically sedimented inequalities. The scale and complexity of these structures and power dynamics often render individual action seemingly insignificant. Nevertheless, this does not eliminate our agency or the possibility of meaningful action. Rather, it calls for a reconsideration of how responsibility is distributed and how change might be catalyzed across different levels of engagement. After all, as Sir David Attenborough (COP24, 2018) said, “If we don’t take action, the collapse of our civilisations and the extinction of much of the natural world is on the horizon.”

The role and potentiality of artistic practice is scrutinized under these lenses. How can creative work foster transformation without falling into the pitfalls of moralism or oversimplification? How can it make urgent issues visible but also cultivate care? As art’s potential does not lie merely in transmitting information. While it is fundamental to be familiar with—and familiarize people with—facts about climate change and environmental destruction, knowledge alone does not automatically translate into sustained engagement or structural change. What is needed, alongside knowledge, is attentiveness—an embodied, affective investment that allows ecological issues to be experienced as personally and collectively meaningful.

¹³ Climate anxiety is real. It is a term for the “feelings of worry, stress, or sadness about climate change and its impacts. It isn’t a single feeling, but rather a mix of emotions, thoughts, and actions that can show up in different ways for different people.” It is important to note that experts do not regard it as a mental health condition but a rational response to the reality we are all facing. If you experience any symptoms, feel free to download a professional toolkit here—<https://www.climatecouncil.org.au/resources/climate-anxiety-toolkit/> (2025)—or explore the possibilities of artistic interventions discussed in the thesis or beyond.

Art can operate as a form of “affective activism¹⁴”: not (necessarily) by delivering ready-made solutions, but by reshaping how the world—or rather, worlds¹⁵ (Escobar, 2016)—are sensed and inhabited. It works beyond mere cognition; by mobilizing emotions, embodied intensities, atmospheres, and relational experiences (Massumi, 2002, p. 28).

This process may be described as what Anna Tsing (2015) calls *the art of noticing*. Transformation begins with attention. To notice is to interrupt habitual perception, to resist the normalization of environmental degradation, and to attune oneself to the subtle presences of other life forms, materials, and processes that co-constitute our environments. The art of noticing is therefore both a political and ecological gesture. It reconfigures our perception in ways that enable us not only to comprehend ecological crises cognitively but also to feel their relational implications.

My artistic and research interest therefore turned to exploring and fine-tuning subtle ways of noticing and *staying with the trouble* (Haraway, 2016, p. 1): to remain present within the messy and often uncomfortable realities and ecological complexities rather than seeking premature, escapist or apocalyptic resolution or distance. To be removed from the observant position and be actively engaged. To deliberately sharpen perception, to learn to sense, notice, and respond to the world—or to become *response-able*—; and to create ways in which wider audiences are engaged in the process, developing new sensitivities and sensibilities towards our ecosystem.

2.1. Reimagining Public Spaces. Citizen Engagement as a Form of Ecological Activism

As Demos (2016, p. 13) argues, “it is often in the civil sphere where we find the most critical and creative energies, the most ambitious and unconventional proposals, in addressing these interlinked crises”: both within institutionalized exhibition arenas of contemporary art and beyond, in “conflicted public spaces, independent media outlets, and in reclaimed zones of autonomy and the commons.” In my research and artistic practice, I primarily focus on activities that take place in public spaces. While there are meaningful works appearing in the white cube and the black box as well, public space offers the possibility of encountering wider audiences and amplifying ecological discourse beyond the confines of the art world; increasing the potential of catalyzing a change on a societal level.

¹⁴ “Affective activism” emerges from affect theory (e.g., Brian Massumi, Sara Ahmed, Eve Kosofsky Sedgwick) and from scholarship in cultural studies, political theory, and social movement studies. It refers broadly to forms of activism that mobilize emotions, embodied intensities, atmospheres, and relational experiences as catalysts for political engagement.

¹⁵ Escobar is one of the most explicit proponents of the concept of the pluriverse, “a way of looking at reality that contrasts with the One-World World assumption that there is a single reality to which there corresponds multiple cultures, perspectives, or subjective representations” (Escobar, 2016: 22). He argues against the idea of a single, universal world structured by modernity and instead proposes “a world where many worlds fit.”

Public art projects dealing with ecological issues may take diverse forms:¹⁶ site-specific interventions that foreground local ecologies, performative encounters that activate embodied awareness, hybrid artist-activist models that generate dialogue, workshops that mobilize citizens, multidisciplinary collaborations between art and science that render complex systems perceptible, or innovations through the combination of art, science, and technology that experiment with practical alternatives or solutions.

The Dust Institute's *Dust-free Chamber* (2021), for instance, temporarily transforms public space into an experiential environment where visitors can encounter air free of particulate matter, pollen, odours, and viruses (see Fig. 5). Complementary *Dust Collection workshops* enable citizens to monitor local air pollution and collectively reflect on its sources and implications. In *Project Dust* (2015), Chinese performance artist Brother Nut responded to Beijing's intense smog by vacuuming polluted air for one hundred days around the city's major landmarks (see Fig. 6). He then compressed and mixed the collected particulate matter with red clay to form a solid brick, materializing an otherwise invisible environmental threat, and creating a potent, tangible symbol of the capital's severe air pollution. Similarly, Marco Barotti's *Clams* (2019) translates real-time water quality data into sound and movement through kinetic sculptures, making invisible pollutants perceptible (see Fig. 7). Gilberto Esparza's *Nomadic Plants* (*Plantas Nómadas*, 2008–2014) goes one step further by drawing polluted river water into microbial fuel cells, where bacteria both degrade toxic substances and generate electricity. The resulting energy powers the installation, while the purified water nourishes the living plants it carries. Installed along contaminated rivers in Mexico, the work simultaneously functions as an ecological experiment and a platform for public dialogue on water pollution, engaging local residents (see Fig. 8).

Other artists cultivate ecological awareness through olfactory encounters. Raimo Saarinen's *Invasive Scent* (2025) discretely places three distinctive scents at different parts of the Finnish Vallisaari island; ones that you come across with during your walk, and ones that are not indigenous but direct your attention to the sensory signals of the changing climate and migrating plant species (see Fig. 9).

Food likewise becomes a medium for ecological reflection. Zane Cerpina and Stahl Stenslie's *Anthropocene Cookbook* (2016–2022) uses speculative recipes, performative dinners, and future food scenarios to question eating habits, environmental degradation, and survival in the Anthropocene¹⁷ (see Fig. 10). Ecological phenomena appear on the menu of *szabadonbalaton*, whose concept bars (2019-) popping up at different locations around Lake Balaton translate local ecological processes—including algal blooms, siltation, eutrophication, and habitat change—into edible and drinkable experiences, combining sensory participation with conversations led by scientists and local experts (see Fig. 11).

¹⁶ For a detailed piece, see my background study made for Veszprém-Balaton 2023 Ltd./PAD to the concept of the Balaton Ecology Festival (VEB2023 European Capital of Culture). basis.balatorium.hu/megkozelites/okologia-es-muveszet-0

¹⁷ Anthropocene refers to the present, human-dominated period in which human activities have become a major force shaping the Earth's environment and systems (Crutzen, 2002). The term remains debated, both because it can obscure the unequal responsibility of different societies and populations for environmental change, and because it is not formally recognised as a geological epoch.

Katie Holten's [*Learning to Be Better Lovers*](#) (2025) encourages visitors to develop new relationships with the local ecosystem through guided walks, workshops and a Forest School, and her Forest Alphabet—a bespoke typeface inspired by local plants, fungi, and lichens—, transforming ecological literacy into a participatory practice (see Fig. 12–Fig. 13). Likewise, Emke Idema's nomadic [*School of Unlived Worlds*](#)¹⁸ (2021–) directs our attention to the various blindspots in our understanding and ecological relations, and by combining philosophy, ecology, artistic exercises, and collective learning in forests and other natural environments, it invites participants to imagine alternative ways of relating to places and other lifeforms (see Fig. 14).

These various public art projects that actively engage citizens, and where audience participation is essential to the completion, fulfilment or even creation of the work, transform members of the audience from spectators into participants, active agents of change. These art practices in the Western context can be linked to concepts such as Nicholas Bourriaud's "*relational aesthetics*", I Lars Bang Larsen's "*social aesthetics*", Suzanne Lacy's "*new genre public art*", Grant Kester's "*dialogic art*" or Joseph Beuys' "*social sculpture*", being artforms closely intertwined with participation, dialogue, and the civic-urban fabric (Thompson, 2012, p. 19-22).

Participatory artistic strategies can also become part of processes of urban transformation through what Tihanyi (2008) describes as *urban pre-rehabilitation*. Small-scale, durational public interventions can create platforms for people to communicate and organise, even in the context of the regeneration of an entire neighbourhood, allowing a better understanding of the territory, the discovery of local values and the formulation of ways to represent them, while at the same time involving the local population in the process of transformation. Through continuous feedback, pre-rehabilitation creates the space and time for an internal renewal that traditional rehabilitation processes are not able to achieve.

One example is the series of interventions developed by the Újirány Group alongside the rehabilitation of Budapest's Palotanegyed between 2008 and 2012. Conceived as a chain of interconnected urban "acupuncture points," twelve interventions activated public and semi-public spaces through diverse methods. Familiar floral patterns were transferred from Budapest's walls onto pavements and incorporated the name *Palotanegyed*, reinforcing the neighbourhood's emerging identity, while a temporary 'rehabilitation office' and participatory mapping created platforms for dialogue and gathering local knowledge (see Fig. 15-16). Other interventions revealed local histories, temporarily tested alternative uses of public space, or involved residents in activating and transforming shared courtyards. Through their accumulation and durational presence, these "acupuncture points" exemplify pre-rehabilitation as a process in which artistic interventions can foster participation, local ownership, and more sustained urban transformation (Tihanyi, 2008; 2016).

¹⁸ Core team: Emke Idema, Marie Groothof, Floor Cremers

Temporary artistic interventions can similarly activate neglected or underused urban spaces while testing alternative ways of inhabiting them. Markus Jeschaunig's [*Oasis No. 8*](#)¹⁹ (2015), a temporary tropical greenhouse was installed on a vacant lot in Graz (see Fig. 17). Powered by waste heat from neighbouring businesses, the installation demonstrated how unused urban energy could sustain the local cultivation of popular but also ecologically demanding tropical plants. Developed in collaboration with the Botanical Garden of Graz, maintained by community volunteers and culminating in a public harvest, the project functioned simultaneously as an ecological prototype, a social experiment, and a critical reflection and alternative strategy to food production, energy use, and urban metabolism.

Long-term community initiatives further demonstrate how artistic practice can contribute to ecological regeneration. Lifepatch's previously discussed [*Jogja River Project*](#) (2011–) combines citizen science, art, and open-source technology to monitor water quality in Yogyakarta's urban rivers while supporting community-led watershed restoration. Ketemu's [*Our Lake of Imagination*](#) (2015) addressed the ecological degradation of Bali's Lake Batur through participatory workshops that brought together artists, students, and local residents to collectively reflect on water pollution and resulting water hyacinth infestation, imagining alternative futures for the lake. The collective of [*Gram Art Project*](#), based in Paradsinga, India, integrates community art with regenerative farming in response to environmental degradation and the agrarian crisis.²⁰ By transforming a genetically modified, monocultural cotton farmland into a zero-budget organic farm,²¹ planting crops in the form of edible land art installations (see Fig. 18), setting up natural irrigation systems that store monsoon water for the dry season, organising seed festivals, and facilitating knowledge exchange between the various generations engaged, the collective demonstrates how artistic practice can support ecological restoration while strengthening local economies, preserving traditional knowledge, and empowering communities. Gram's activities served as a model for surrounding villages as well, and rather than functioning as a temporary intervention, it has evolved into a long-term platform where art, farming, education, and social entrepreneurship operate as mutually reinforcing forms of ecological practice.

Participatory public art processes can thus operate on several levels. They can serve as an inclusive site for research and creation, a platform for raising questions and attentiveness, exchanging knowledge, collaboration, but also for identity formation and internal renewal, or for experiencing a changing spatial experience.

As, when considering the relationship between art and space, it is crucial to recognize that space is not a passive, pre-existing background for the creation and experience of art; instead, the processes of making art and shaping space are closely intertwined. "The 'spaces' that art is making and is made by may take many forms; such as the social spaces of socially engaged art, spaces of embodied experience found in phenomenologically engaged performative or

¹⁹ Inspired by Haus-Rucker-Co's installation *Oasis No. 7* (1972, documenta 5).

²⁰ Paradsinga, India, is an area facing severe climate problems, harmful chemical farming methods and GM seed use, lack of water supply, soil erosion, and as a result, a high number of farmers' suicides.

²¹ Meaning, all fertilizers and pesticides are made from the materials found around the farm, such as *jiwamrita* for fertilizing and neem-chilli mix to keep pests away.

installative practices, or the spaces of encounters in cosmopolitan or not-so-cosmopolitan settings.” (Hawkins, 2017, p. xvii).

Especially in the context of our present-day socio-ecological challenges, understanding the complexity and potential of public spaces is of crucial importance. Artists addressing pressing issues and urgencies in these public domains do not necessarily aim to challenge the art worlds of galleries and museums in the first place, but are rather devoted to revive and foster collectivity and connectivity within and together with the broader society.

Real societal change occurs most often in a shared, physical location, where a mass of people gathers. As Carol Becker (2012, p. 66-67) argues, “we humans need the *agora*, the public square—as it existed in ancient Greece, a site where we come together physically, as bodies, in order to hear one another.” Artistic interventions in public space can be understood as the embodiment of these (often temporary or transitional) agoras—places of debate, exchange, and shared imagination. Platforms to practice the art of noticing, to experiment with new perspectives or alternative ways of doing. Opportunities to unlearn the worlds as we know them, and attempt to construct new ones.



Figure 5. *Dust Institute: Dust-free Chamber*. 2021. Image source: artist's website



Figure 6. *Brother Nut: Project Dust*. 2015. Beijing, China. Photo: Dong Dalu/CFP. Image source: The New York Times



Figure 7. *Marco Barotti: Clams*. 2019. Image source: artist's website



Figure 8. *Gilberto Esparza: Nomadic Plants*. 2008-2014. Image source: artist's website



Figure 9. Raimo Saarinen: *Invasive Scent*. 2025. Helsinki Biennial 2025, Vallisaari Island. Photo: HAM / Helsinki Biennial / Sonja Hyttiäinen.



Figure 10. Zane Cerpina & Stahl Stenslie: *Anthropocene Cookbook*. 2022. Image source: artist's website



Figure 11. *szabadonbalaton: C:N:P bar*. 2021. Photo: Neogrády-Kiss Barnabás / szabadonbalaton.



Figure 12. Katie Holten: *Learning To Be Better Lovers (Forest Alphabet)*, 2025, detail. Helsinki Biennial 2025, Esplanade Park. Photo: HAM / Helsinki Biennial / Henni Hyvärinen



Figure 13. *Katie Holten: Learning to be Better Lovers*, June 8, 2025, a forest walk with Katie Holten on Vallisaari island, Helsinki. Photo: HAM/Helsinki Biennial/Henni Hyvärinen

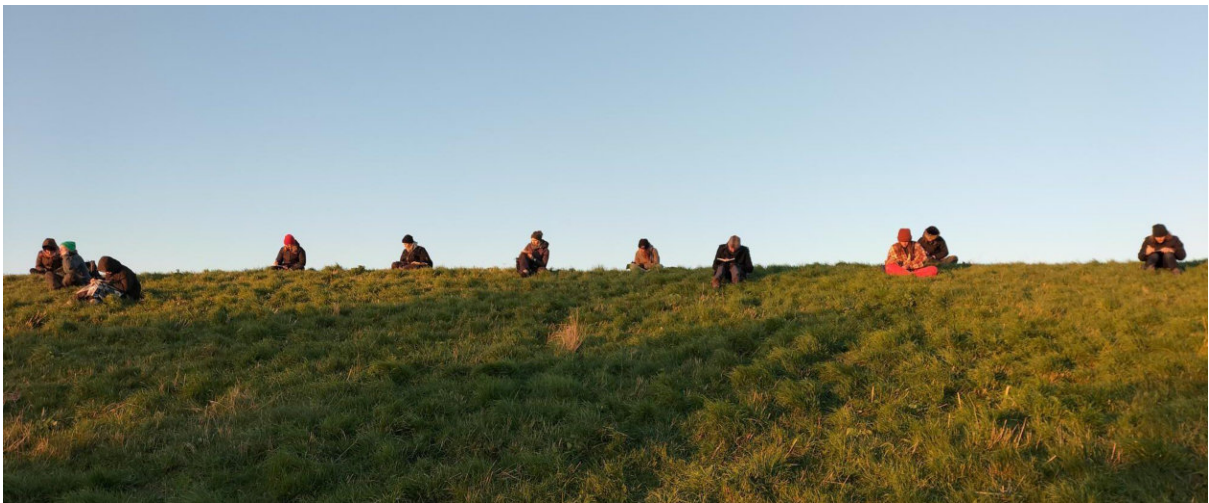


Figure 14. *Emke Idema: School of Unlived Worlds*. 2022. near Hornhuizen, Groningen, Netherlands. Photo: Emke Idema



Figure 15. Dominika Tihanyi (Újirány Group) & Tamás Tibor (Rév 8 Zrt.): Temporary 'rehabilitation office.' 2008. Lumen Cafe, Budapest, Hungary. Photo: Dominika Tihanyi



Figure 16. Dominika Tihanyi, Árpád Kovács, Dorottya Thurnay: Pollmap – The Interactive Mapping Project. 2008. Budapest, Hungary. Photo: Dominika Tihanyi



Figure 17. Markus Jeschaunig: *Oasis No.8*. 2016. Graz, Austria. Photo: Simon Oberhofer



Figure 18. *Gram Art Project: Grow in India*. 2016. Paradsinga, India. Photo courtesy of the artists.

2.2 Case Study: SENSING THE CITY

At the end of the year 2020, the IN SITU network, a European platform for artistic creation in public space, launched its new project called [*\(Un\)common Spaces*](#), which aimed to reinvent the relation between the cultural sector and the civil society by gathering a circle of Associate Artists²² and a circle of Associate Citizens²³ to address the urgencies our environment and societies have to face. The partner institutions²⁴ who form the network believe in public space “as a democratic place where art brings new perspectives and contributes to the transformation of our territories and societies” (IN SITU). In this project, they targeted to closely engage the civil sector as well to share skills, visions and plurality of perspectives to ensure that artists build in-depth relationships with inhabitants and artworks engage diverse audiences through various ways of participation.

In the four years of the program (2020-2024), each Associate Artist was involved with several partners within the network through research and production residencies, festival appearances, and worked in close collaboration with their own Associate Partner. As the Hungarian Associate Artists of the project, I started a closer collaboration with Artopolis Foundation and its director Fanni Nánay, the Hungarian partner who has been organizing PLACCC Festival since 2008.

[*PLACCC*](#) offers a programme of artistic projects that step outside conventional venues and take the site itself as creative principle. Public spaces, common and *uncommon* spaces—be it a natural environment, an urban location or a particular building—become the venue, the starting point, the governing force for artistic expression and dialogue. PLACCC has been addressing issues of tolerance, openness, diversity and acceptance, topics that are marginalized in political discourse in Hungary, and has been trying to fight for these values through art. Wanting to expand its thematics to urgent environmental topics as well, my collaboration with PLACCC has been based on an invitation for a multi-role position: besides developing my own artistic projects, I started to curate a program series as part of the festival, focusing on urban environmental and ecological topics, called SENSING THE CITY.

²² artists selected by the network; each partner appointed three candidates among which other members of the network made the final selection

²³ people from the civil society, e.g. urbanists, project managers, social workers, environmental practitioners, workers of the public space

²⁴ IN SITU is the European platform for artistic creation in public space Led by Lieux publics, a European and national centre based in Marseille, France and co-funded by the European Commission. **(Un)common Spaces project partners (2020-2024):** Lieux publics, Marseille, France – Project Leader; Artopolis Association, Budapest, Hungary; Atelier 231, Sotteville-Les-Rouen, France; Čtyři Dny / Four Days, Prague, Czech Republic; Firatàrrega, Tàrrega, Spain; Freedom Festival, Hull, The United Kingdom; Kimmel Center, Philadelphia, The United States of America; La Strada, Graz, Austria; Metropolis, Copenhagen, Denmark; Norfolk & Norwich Festival, Norwich, The United Kingdom; Oerol Festival, Terschelling, The Netherlands; Østfold Internasjonale Teater, Fredrikstad, Norway; Oda, Pristina, Kosovo; Provinciaal Domein Dommelhof, Neerpelt, Belgium; Scène Nationale De L’Essonne, Agora-Desnos, Evry, France; An Association of 4 Italian partners: Zona K, Milano, Indisciplinarte, Terni, Pergine Festival, Teatro Di Sardegna. **More info:** <https://www.in-situ.info>

2.2.1. Curatorial Concept and Principles: Sensing as a Method

What can we learn *about*, *in* and *with* the city by activating our senses?

This is a question that has been at the center of SENSING THE CITY, a curatorial project that hosts small-scale public interventions and related thematic discussions to help urban citizens explore and reflect on the environmental and ecological challenges, ecopolitical issues of Budapest through a variety of (multi)sensory experiences. On a broader scale, the aim is to raise fundamental questions and open a dialogue about the state of our cities—our lands, skies and waters—, the impact of our individual and social practices. As such, the term *sensing* has a double meaning, as it refers to both the physical perception of the city (the reaction of the body) and the active sensitization of urban locations and concerns with the presence of the body.

In our current fast-paced, high-pressure capitalist environment driven by demands to perform and produce more, our ways of perceiving and connecting have also changed. Certain perceptual capacities have intensified, others have gradually receded to the margins of our awareness, and some have become obscured or nearly obsolete. “The loss of diversity is therefore not only visible in the decreasing number of species, or in the appearance of our environment, but also in our own perceptive capability. This has an effect on the ways and quality of connections, both with our environment, with ourselves and our fellow human beings” (Mogyorósy, 2024).

At the heart of the project lies the belief that *multisensory* approaches can open up completely different qualities of experience in the process of embracing controversial topics, fostering a deep, relational and emotional connection that transcends purely cognitive, or conscious engagement. Embodied experiences allow participants to make sense of the world(s) and produce knowledge through non-verbal, sensory means, leading to a more primal sense of interconnectedness with natural ecosystems and other lifeforms.

While vision has historically been privileged in the West as the most reliable path to knowledge, it is often culturally associated with distance and objectivity. The observing gaze tends to construct a subject/object relation that results in a certain distance between the two, not allowing equity. Just as the colonizer gazes at the unknown surroundings, creating the position of the observer, limiting our connection to vision only leads to the power dynamic of “surveilling and radicalizing the other without active participation or showing vulnerability” (van der Loo, 2021, p. 41). On the contrary, multisensory experiences bridge this distance and bring the perceiver into an intimate relation with the environment, demanding presence, participation, and vulnerability, and at the same time cultivating empathy and deepening memory.

Rediscovering and reactivating other senses and their embodied perceptions therefore allows a more versatile understanding of other beings (van der Loo, 2021, p. 41); the city itself as a living organism, and the lifeforms and life processes that constitute it. With this very intention, SENSING THE CITY has welcomed micro-interventions of diverse artistic

mediums and genres, and engaged people of different sectors and expertise across the last years. The core principles of the project are reflected in its criteria for selection (Table 1).

thematic relevance and context-specificity	Does the project raise thematically relevant questions? Is it based on research in art and/or science? Is it up-to-date knowledge?
public space and site-specificity	Is the project embedded in public space? How does it reflect on or engage those spaces?
multi-sensoriality	How does the project engage the senses and create embodied experiences, corporeal understandings?
novelty	Does the project raise new questions and offer new perspectives? Is there novelty in the artistic language and expression?
ecological footprint	Does the project consider the ecological footprint of the use of materials, transportation, duration? If yes, how? If not, why?
public engagement	Does the project engage audiences in the creation process? Is there a level of interactivity? Does it involve participation?
multidisciplinarity and multi-sectorality	Does the project involve multiple disciplines? Is there a collaboration among different sectors (cultural, technology, science, ngo, etc.)?
art as a catalyst	Does the project raise awareness and attentiveness to a specific issue? Does it question the status quo, and offer new perspectives or ways of being, doing?

Table 1. Curatorial principles and selection criteria of SENSING THE CITY

Site-specificity and the *public* aspect being cornerstones of both the festival and the curatorial program, the projects appear in various types of public spaces that are conceptually relevant and reciprocating the messages to be conveyed: market halls, private and community gardens, unfinished and unused shops, polluted public spaces, city parks, an abandoned cemetery, a quarry, the riverbank, a future construction site, and a library terrace have served as such spaces up to the present.

We find it important that the public nature of the festival program is not only reflected in the choices of location, but the content itself is also shaped by people who work outside the art scene; in urbanism, architecture, ecology, sociology, or activism for instance. These

expertises, the intersection of art & science may appear in various ways within a project in terms of reciprocity: on the one hand, art can address a scientific problem or question at a thematic level, on the other hand, it can rely on deeper research involving experts in the field, and finally, through the art project, a mutual knowledge transfer and collaboration between the two fields can be initiated. All three approaches are equally valid, but with SENSING THE CITY, our aim has been to find a productive reciprocal relationship between art and science, where the scientific approach can also feed on the artistic one. (Fanni Nánay cited in Ternai, 2022) For this very reason, our open calls have been available for people of various backgrounds, granting support for interdisciplinary groups and hybrid methodologies as well, and a collateral public thematic discussion to each art project, where the creators of the projects discuss the topics they are working on with relevant experts, exchanging knowledge and experiences, or raising novel questions and concerns.

This is intertwined with and supporting our principle of the projects raising *thematically relevant questions* and up-to-date knowledge, reflecting on the local context of Budapest and the environmental and ecological issues the city faces, also assuming a certain level of *multidisciplinary* and *multi-sectorality* discussed above.

Engagement is not limited to these artist-scientist collaborations, but projects also seek various ways in which the audience can be meaningfully activated. This can vary from interactivity to various levels of participation, either in the research, creation or the presentation of the work. Given the name of the program, one crucial method of engagement happens through the activation of the *senses*, creating embodied experiences and knowledge(s) thoroughly discussed above, *catalysing potential agents of change*.

2.2.2. Artist as a Curator

The methods and principles underpinning the curatorial concept are closely aligned with those that inform my own artistic practice. The question emerges then: what does being an *artist as a curator*²⁵ mean? How do I define myself and my practice in the role of the curator,²⁶ with special attention to the catalytic potential of artworks?

I primarily identify myself as an artist. Yet, being an artist whose practice is inherently collaborative—developed in dialogue with other artists, other sectors, and local citizens—,

²⁵ For discussions of the “artist as curator,” see Elena Filipovic, *The Artist as Curator: An Anthology* (2013), and Celina Jeffery (ed.), *The Artist as Curator* (2015), both referenced further in this chapter.

²⁶ I first tested myself in this position in 2018, when I organized and curated a one-week artist residency at the Ecological Institute in Gömörzölös. The Institute has been present in the village since 1993 and has been working on its program “Gömörzölös, the sustainable village,” managing a permaculture farm, extensive orchards, and applying various sustainable innovations. During the residency program, eight artists were invited for an incubation week to develop ideas and artworks of various media (community-based processes, site-specific installations, new media performances) related to the values and aspirations of the Institute. The works were presented in the form of a public walk, where the villagers and visitors were guided through the concepts and outcomes along a collective dialogue. The experiences of the week and ideas were also shared during a roundtable discussion in the Studio of Young Artists’s Association in Budapest.

More information: <http://evabubla.art/ertem>

I later was a member of the curatorial team of the Balatorium artist residency (VEB2023 ECoC) as well, a program focusing on the Lake Balaton region and addressing local ecological threats and environmental issues through context-specific artistic research and production. More information: <https://balatorium.hu>.

reframing the understanding of the curatorial practice as a collaborative artform eased my relation to this position; in which I do not seize to think as an artist, but transplant my artistic interests and strategies into a curatorial framework.

Historically, curating was largely understood as a custodial and administrative activity concerned with the care, classification, and presentation of artworks within institutional settings. Starting in the late twentieth century, however, this understanding gradually shifted towards a mediating and performative practice that increasingly resembled artistic production itself (O'Neill, 2012, p. 3–4). Parallel to this transformation, artists also began adopting curatorial strategies as part of their own practice, challenging institutional hierarchies and expanding artistic production beyond the autonomous artwork toward exhibitions, events, archives, discursive platforms, and collaborative processes (O'Neill, 2012, p. 105). This shift reflects broader changes in the social function of art, moving from object-centred production towards discursive, participatory, and process-oriented forms of cultural practice and knowledge-production.²⁷

Within this expanded framework, the *artist as a curator* assumes both authorship and mediation, designing exhibitions or other forms of artistic events not merely as displays but as conceptual and experiential spaces. In every instance, this hybrid role serves as a method to establish a form of creative practice and critical strategy, which intentionally challenges the disciplinary boundaries of art and curation. “There is the idea that curating can be an extension of artistic practice manifested in a multiplicity of ways: the curation of one’s own work; the curation of objects outside the art museum; or curation as a means to explore a shared or collaborative process, idea or thematic central to the artist’s own practice” (Jeffry, 2015, p. 7). Therefore, curating becomes an extension of artistic thinking questioning how artworks produce meaning through spatial, temporal, and social relations.

This understanding aligns with the notion of curatorial authorship, in which curating is recognised as an active, interpretive, and political practice rather than a neutral organisational task (O'Neill, 2012, pp. 3–4). As Bruce Checefsky (cited in Filipovic, 2012, pp. 180–81) argues, “the curatorial act involves the interrelationship of viewer, context, and time and, in an ultimate sense, the primary engagement of audiences as well. Here, it is not only the creative and collaborative encouragement of the curator that acts as a catalyst for engagement but also the ‘care’²⁸ attributed to the event.” From this perspective, the exhibition or public programme may itself become the artistic form (Buren, as cited in Richter, 2013), resonating with Bourriaud’s (2002, p. 18) relational aesthetics, in which participation, dialogue, and encounter become central artistic materials.

²⁷ Within the framework of New Institutionalism, which reconceived art institutions not as neutral spaces for displaying objects but as active sites of knowledge production, experimentation, and public dialogue, curatorial practice became less concerned with exhibiting completed artworks than with creating infrastructures for participation, collaboration, and collective learning. “Seen this way, ‘curating’ would be the technical modality—which we know from art institutions and independent projects alike—and ‘the curatorial’ a more viral presence consisting of signification processes and relationships between objects, people, places, ideas, and so forth, that strives to create friction and push new ideas—to do something other than ‘business as usual’ within and beyond contemporary art” (Lind, 2010, p. 63).

²⁸ care (‘curare’) for people, places, objects and ideas

It is within this understanding that I position SENSING THE CITY. The project is simultaneously a curatorial programme, a conceptual framework, a methodological platform, and an artistic work. It is a growing platform that fosters collaboration and exchange among artists, scientists, and the general public, supporting diverse artistic methodologies and sensory-based practices of urban exploration.

2.2.3. Sensing the City 2021-2025

The projects took different approaches to specific issues as segments of a greater global climate crisis: (un)sustainable agricultural practices, waste management, sound and air pollution, water crisis, biodiversity and the urban microbiome, the disappearance of public spaces and changing conception of land-related law, decay, or climate anxiety. By raising questions, inviting audiences to think together and possibly imagine alternatives, the interventions brought the topics closer and made them more tangible, sensible, turning the local-global aspect into experiential, thus personal. Chosen methodologies and artistic formats have included installative and performative works alike, experimenting with various types of public engagement.

Not Quite California Wonder (2021) by the artistic duo [Fuzzy Earth](#) focused on *Capsicum annuum* (bell pepper) and greenhouse environments, challenging the era of industrial agriculture, where most vegetables are produced in distant lands, physically and ideologically disconnected from the consumer society. While all year-long operating automated greenhouses are taking over the shelves of supermarkets, the stalls of traditional market halls are slumbering, often becoming expensive, exclusive and elitist. Possible eco-centered alternatives to agricultural production and the producer-consumer relationship already exist on a small-scale, such as the “pick your own” program,²⁹ or the seasonal vegetable box distribution system³⁰ of partners like Cargonomia³¹ and the Organic Farm of Zsámbok (Lazányi, Urban Dialogues 2021); however, Fuzzy Earth was interested in possible alternatives of the industrial scale. They believe in the transforming power of future market halls, foreseeing a democratically shared space between humans and agro-botanical species: an agora. A political, ritualistic and social space where humans are considered as guests, and plants are seen as partners. For the five days of the festival, a conventional market stall became a living experiment hosted by the California Wonder bell pepper, unfolding this speculative scenario for the visitors of the Rákóczi Market Hall (see Fig. 19). Through the medium of film, accompanied by various artifacts, the bell pepper shared memories about its

²⁹ “Pick your own” (PYO) is a type of farm where customers harvest their own fruits, vegetables, or flowers and pay based on the amount they pick. This model allows customers to get fresh, high-quality produce directly from the source, often at a lower price, and provides a farm-gate marketing strategy for farmers that can include agritourism aspects like farm visits.

³⁰ A direct-to-consumer model where local farms or cooperatives provide weekly or bi-weekly deliveries of seasonal produce directly to households or centralized neighborhood pickup points. It eliminates supermarket intermediaries, ensuring fresher food and supporting local agriculture.

³¹ Cargonomia is a Budapest-based cooperative focusing on sustainable living, and serves as a center for organic food distribution (from Zsámboki Biokert), sustainable transport (cargo bikes), and community building. It advocates for concepts such as degrowth and local resilience through the sharing of resources and events including DIY workshops and educational activities. <http://cargonomia.hu>

altering role as a plant, food, industry, symbol of political power and ecological catalyst. It reminded us about the co-dependence of our species, and by this ritualistic artistic act, attempted to rebuild the personal connection between humans and plants, humans and humans.

Fireworks (2021) by Katalin Kortmann, Bálint Katona and András Kaprinyák pursued making the extreme amount of waste generated in Budapest visible by video installations, elements of sound, smoke and taste related to the capital's incinerator. 60% of Budapest's waste which cannot be recycled—in a year, a one-meter-high area the size of Margaret Island—ends up in the facility and is utilized for district heating. The remaining 40% is transported to Pusztaszámoly, where a 4 million m³ garbage heap has been formed already; an amount that could be burnt and used for heating if there was a second incinerator in the capital. It does not exist yet, and even if there are strict regulations regarding emission levels, the target of a circular economy is not to create waste that cannot be recycled in the first place. While it would be the producer's responsibility to choose recyclable or ecological solutions of packaging, among many others, that is not the status quo, unfairly increasing the importance of the consumer's habit of what is bought and how it is disposed of (Kanozsai & Sámson, *Urban Dialogues* 2021). The capital's huge amount of waste is invisible to the general eye from the moment citizens discard them; but it very much exists. The artists' intervention wanted to make this visible, audible, tastable, sensitively directing the attention to the present state of things. They did not intend to create an educational program but an atmosphere of various textures, smells, sounds that highlights the situation and resonates at an emotional level. Chopin's manipulated classical music mixed with the sound of burning waste invited people into the space of an unused shop, where photo and video footage of the incinerator's activities were on display (see Fig. 20). During the roundtable with colleagues of the Municipal Public Services Co. Ltd. (FKF), vegan bites made from kitchen by-products further enabled the human sensorium to explore concepts and possibilities around waste and circularity.

Near the Stadionok metro station, plexiglass sheets mounted on a square iron frame stopped passersby for a moment to reflect on the future of the area, where a new mall is to be built soon (see Fig. 21). Standing inside the structure, you see the outlines of the planned construction drawn on the plexiglass, which, for the moment, "is only a translucent vision of the future, but one that is already sharply redrawing the urban landscape" (Mogyorósy, 2024). The installation of architect Boglárka Jakabfi-Kovács, *What You See: a Public Affair (2024)* drew attention to the so-called robbery and misappropriation of public spaces, taking a rather political stand and engaging the public to dare to have a say in the development of the spaces around us. Cities are rapidly changing and expanding, and various urban developments are determined by the values of current economic policy. Following the change of regime, it has become typical for Hungary, particularly its capital, to allow urban development to fall under the control of real estate developers, whose objectives drive decision-making. Over the past ten years, this situation has escalated harshly. With limited opportunities to invest their vast wealth, these developers are focusing on safeguarding it through real estate, bolstered by substantial government backing (Lányi, *Urban Dialogues* 2024) and the economic myth of

manic growth. This makes the need for public discourse indispensable. The robbery and misappropriation of public spaces is not a private matter for property developers and investors, but a public matter in its purest sense. As Jakabfi argues, the urban silhouette is part of the social space, therefore, any change that has a significant impact on the urban landscape is indeed a public matter. Investments into skyscrapers, MOL towers, parcels of land cleared from urban forests, or just another shopping mall degrade social spaces into transportation or consumer ones. While, on the contrary, well-functioning urban spaces also provide opportunities for encounter and leisure, being rich in aspects that make people want to stay. The installation aims to draw attention to the most evident one: the necessity to have public space in the first place. Not one that is robbed and heavily constructed, but one that is available, accessible, breathable. One that enriches life not empowers the rich. One that is integrated in the social discourse. The interactive nature of the installation invited the passersby to have a word to say; the pre-existing drawings on the glass called attention to the abduction of space but at the same time created a platform for conversation, functioning as some sort of community survey and planning, enabling members of the public to leave a mark and draw their own future imaginations on the glass.

This is how spaces can be turned into places in the long term. *Placemaking* “inspires people to collectively reimagine and reinvent public spaces as the heart of every community” (Project for Public Spaces, 2008). A strong sense of place can influence the wellbeing of people (Marko & Lisa, 2022), which then reciprocates in how they relate to and treat their environment. [Valyo](#), a citizens’ initiative whose goal is to reactivate the Danube waterfront, have been involved in the creation of various iconic events in Budapest. They have turned the LibBridge (Szabihíd) into a creative community space for pedestrians and cyclists every summer for four weekends, hosting colorful programs. Their legendary Valyo bus, a culture bar and a roaming literary centre in the summer, hosted sauna-lovers for six winters at various locations by the Danube riverbank. They converted a standing boat into a public space, putting the kind of Danube shore they envision for Budapest into practice: open, green and playful. They conceptualized and designed a free beach on the Roman Coast, organized a five-day construction camp to make the symbolic elements of the beach, and tested them by hundreds at the Free Beach Test Day; making the Roman Coast the place where it was possible to swim legally on the Budapest section of the Danube for the first time in almost half a century. The list could continue. When it comes to placemaking, through their consistent presence and expertise, Valyo focuses on assessing these fascinating, inspirational, yet frequently overlooked spaces, and draws attention to them using creative and community development tools, while making proposals for better utilization.

Our collaboration with Valyo took place along their QUAY project. Since 2020, the Lower Quay in Pest has been closed to car traffic and open for the public on weekends, and in 2023 a new area was added: the Jane Haining Quay. In addition to the weekend openings, the area was also open to the public on weekdays for 20 consecutive days during the summer. Valyo gradually set up a recreation park³² there with direct access to the Danube. In addition to the

³² with potted plants and herb gardens, street furniture, two public barbecues, a sandbox, a bar and community space opened in the viaducts under the tramline

daily summer activities that flooded the place, the QUAY hosted more than two hundred activities organised by the city's residents and Valyo's collaborators, including yoga classes, concerts, performances, film screenings, sport events, talks, boardgaming; and two art projects of SENSING THE CITY.

My portable installation [*Designated Breathing Zone 2.0*](#)³³ (2023) appeared in Budapest at two locations affected by heavy traffic: at the Nyugati Square and at the QUAY (see Fig. 22). The installation, which invites the audience to inhale air from an incubated plant module, serves not only as a dystopian object to breathe in clean air, but is also a space for dialogue. The gradual disappearance of rural and wild areas, and their transformation into densely populated cities and urban zones are leading to a series of environmental problems. The often debatable city planning, the elimination of green areas, or heavy traffic all contribute to the degradation of urban air quality. Green belts could play a significant role in air pollution abatement, and even though in several cities there are regulations for the minimum amount of it, case studies show that the number is not met in practice (Ratnasari et al. 2015, pp. 196-208). Air pollution is an acute problem in Hungary as well, causing the premature deaths of 13.000 people a year at national level, according to Clean Air Action Group publications (levego.hu), not to mention other health and environmental impacts. To reduce air pollution, the first step is to eliminate or reduce anthropogenic-caused emissions. The second step is to remediate existing pollutants, in which plants and city planning can play an important role (Wei, X. et al. 2017, p. 2). Designated Breathing Zone aims to channel this knowledge and discussion into the public realm, while harvesting citizen experiences about urban planning and future imaginations about—greener and more breathable—cities.

Though it was no longer part of the SENSING THE CITY program, I find it important to briefly include the development of the project. My research progressed and I became rather concerned with what is beyond the so-called ecosystem services of trees; a fairly human-centered concept. Observing air quality from a different angle, I started to experiment with possible (speculative) experiences of breathing from the perspective of the air itself, getting into a dialogue with existing urban greens and lifeforms. I read a dozen of scientific literature, had enriching conversations with experts of ecology, biology, social sciences and nature facilitation, and also spent hours contemplating, or observing my own body and thinking what the air entering and leaving it might sense. On a number of occasions I even had to remind myself to focus on air in its complexity, and not only oxygen, a useful element of it for my human body. I was training my brain to widen the human horizon, while being absolutely aware that essentially my human existence colors everything. This is how the text of sound installation *Breathing* (2024) was born, a combination of science-based speculative

³³ The first version of Designated Breathing Zone (2019) was inspired by the growing level of air pollution I experienced in my former home in Indonesia, and the dystopic future imaginations it triggered. To reduce air pollution, the first step would be to eliminate or reduce anthropogenic-caused emissions; which is a climate pledge still overlooked by stakeholders in power positions. The second step is to remediate existing pollutants, in which plants and city planning can play an important role. Inspired by a 1989 NASA report (Wolverton et al., 1989) which tested indoor plants that are most effective in purifying indoor air, I used the Sansevieria plant to critically reflect on the topic of air pollution, the effect of human activities, and the importance of plants in our ecosystem. Designated Breathing Zone invites the audience to inhale the air ventilated from an incubated plant module. During a workshop in Sekolah Akar Rumpit, DIY experimental objects were constructed using the Sansevieria plant and the mechanisms of air purification devices already available on the market (hacking) with the purpose of initiating a dialogue with kids about the issue.

storytelling and somatic practices, placed inside the intimate space of [*Designated Breathing Zone 3.0*](#) (2024) near Gellért Hill's canopies (see Fig. 23). This version of the installation, a wooden cabin visitors can climb into on a metal ladder, is incubating the human itself, with the gaze directed to the opening of the structure towards the “empty” sky and filling it with the sound of the air talking and the stories of the various organisms that inhabit it, closing out the view of all man-made constructions, focusing on the natural (Orbán, 2024). The main intention was to make people notice and listen to the various lifeforms that they share the city with, especially on one of the last large contiguous green areas in Budapest which is also slowly taken over by investments and constructions.

Éva Freund's installation and workshop *Layers of Water* (2024) also drew attention to the multilayered, reciprocal relationship of human and more-than-human lifeforms, engaging visitors of the QUAY to connect to water bodies. Focusing on water filtration, the project explored various aspects of filtration itself on abstract (mental ecology³⁴) and concrete (environmental ecology³⁵) terms as well, making the substance of water a carrier of rich narratives. A great part of our human body consists of water, still, separating and as such alienating ourselves from living water bodies as the Danube has become the norm. Since the Great Flood, the river has been closed in between protective structures and dams, and has been mostly associated with danger, dirt and toxicity (Lohász, Urban Dialogues 2024). It is almost impossible to approach the aorta of the city, the one that supplies water to households in Budapest. As chemist and water hygiene expert Dr. Dóra Gere of the National Centre for Public Health and Pharmacy explained (Urban Dialogues 2024), there are wells installed at several points near the Danube, and while she would not recommend the consumption of surface water due to possible exposure to pollution, the coastal filtration layers (gravels of various size, sand) turn the river water into drinkable quality by the time it reaches the water basins of the Budapest WaterWorks.³⁶ On the other hand, public beaches are constantly monitored in terms of water quality, and are suitable for leisure activities and regular nature contact. To rechannel the water body into the human horizon, the installation of an immense, three-legged glass vessel by the quay held the water of the Danube inside, flowing through layers of the different filtering materials (gravels, sand, active carbon) and associative projections (fMRI and EEG images), slowly dripping physical and mental substances into a glass below in consumable quality (see Fig. 24). By tasting the filtered river, the poetic yet functional installation created an embodied relation with the Danube water body. A collateral workshop of making a more modest version of a water filter further engaged citizens and widened possibilities to imagine the reintegration of the Danube into the city's fabric on a human scale.

³⁴ Mental ecology is one of the three interconnected ecological registers proposed by Félix Guattari, alongside social and environmental ecology. Rather than treating ecological problems as belonging exclusively to the natural environment, Guattari extends ecological thinking to processes of human subjectivity, including perception, sensibility, desire, and ways of thinking. He argues that ecological transformation therefore requires an interconnected consideration of environmental relations, social relations, and the production of subjectivity (Guattari, 1989).

³⁵ Environmental ecology refers to the ecological relationships between organisms and their biophysical environments, examining the structure, functioning, and resilience of ecosystems through the interactions of living and non-living components.

³⁶ There are two water basins of the Budapest WaterWorks, the Northern and the Southern one. In both places, water is treated with chlorine to prevent bacterial growth, and due to its high iron content, the Southern one is treated with ozone as well.

*Water Level*³⁷ (2024) approached water concerns using an utterly different artistic methodology. The participatory theatre play of Anita Patonay and Viktor Bori invited the audience to travel to 2040 and have an embodied experience of the future Budapest, a city facing severe water shortage due to the climate crisis. The audience as an “in situ formed” community found itself becoming members of a water management course that the citizens of 2040 have to complete in order to familiarize themselves with the countless water regulations and protocols they need to follow (see Fig. 25). Placing yourself into this fictional world, learning about the state of things and making prompt decisions created a visceral experience, helping each future citizen feel the gravity of the issue. We arrived with empty water bottles to the course and were given a deciliter of water in case of a correct answer at the course, which demonstrated the value of the vital substance at risk. The lived experiences of the play could be transplanted into the future- and climate-related discussions of the debate theatre that followed the play. The subtle transition from fiction to reality evoked emotionally charged and thought-provoking reflections, with present future-citizens sharing their varying viewpoints and coping mechanisms for the climate crisis, often inspiring each other to reconsider their previous decisions. The power of the play lies in its ability to trigger, host and facilitate such conversations, which enrich your scientific knowledge as well as your skill to imagine ways to cope with the future, or ideas for possible change in the present. Having Bence Fülöp, an expert on water management and stakeholder consultation in the audience—who later was a panelist in the roundtable discussion with the artists—gave a further depth to these discussions. His knowledge in climate research and models with special focus on the water systems of future Hungary complemented the fiction and speculation with real data and up-to-date science, adding further insight into possible future outcomes. Various climate change scenarios exist, depending on the rise of global average surface temperature. The Paris Agreement (2016) aimed at keeping global warming below 1.5 °C,³⁸ but it has already been exceeded (WMO, 2025), putting climate goals in grave danger. As a result of this, according to Fülöp, the so-called RCP 4.5³⁹ is the most likely positive climate change scenario for the future, which predicts slightly more rain for Hungary than at the present, but in a new structure of increasingly hot and dry summers and rainy seasons for the next 20-30 years, after which further warming stops. RCP 8.5 predicts the most drastic change in temperature with severe water shortages, which would cause the collapse of present-day social systems and the emergence of climate wars. While we are hopeful, the only certainty is that the climate is changing, we just do not know to what extent. Best would be to mitigate global warming and its consequences, but in Hungary, a country where governments and societies are not easy to change policies or habits, and where our emissions are high compared to other European countries, our most likely strategy will be to adapt (Fülöp, Urban

³⁷ The play is based on Tamás Rojik’s youth novel *Drought*.

³⁸ compared to pre-industrial times

³⁹ Representative Concentration Pathways (RCP) are scenarios of future greenhouse gas concentrations used by climate scientists to estimate potential future climate conditions. The numbers in the names (eg. RCP2.6, RCP4.5, RCP6.0, RCP8.5) indicate the expected level of radiative forcing (measured in Watts per square meter, W/m^2) that the Earth’s atmosphere is projected to retain by the year 2100. These pathways are applied to model potential future climate changes, assess risks, and guide policy decisions concerning emissions reductions.

<https://climate.copernicus.eu/sites/default/files/2021-01/infosheet3.pdf>
<https://ijasa.ac.at/models-tools-data/rcp>

Dialogues 2024). While Fülöp shared some useful tips, the play also mobilized its participants to imagine the possibilities for action at the social and individual level.

Performativity found its way to embody further climate-related questions and concerns. *No Endpoint* (2021), the twelve-hour vigil performance of [SVUNG Research Group](#) took place at an abandoned cemetery, from sunset to sunrise, to explore the human and environmental aspects of materiality in the cycle of life and death (see Fig. 26). The area, which had been a natural site originally, was used for burial purposes at some point in time, and is now taken over by nature again but is not untouched by human hands. Waste covering lands and waters, endangering the lives of other species is all too familiar of an image for all of us. A hidden corner of the chosen cemetery is unfortunately also not safe from illegal garbage dumps; several layers of life and death exist in the space. In a biological sense, human life ends when vital functions—such as heartbeat, breathing, and brain activity—stop completely, and we gradually decompose, but when do objects cease to exist? When is a material object dead—after it has been disposed of or after it has been destroyed? Human death is still a taboo in our Western culture, while the life cycle of objects is also often ignored, jeopardizing our ecosystem. We mute and seemingly split ourselves off from nature, exploiting it and causing our own demise. This is not a real break though, as we cannot leave the system of which we are a part of, only our consciousness splits and fades away, causing ecological problems but also buried internal tension, longing, desire, and pain. It can also be understood as silent grief; we grieve our own alienation and what is happening to the ecosystem, but processing it through mourning is also the key to moving forward and acting in a meaningful way (Molnár, Urban Dialogues 2021). The performative vigil channeled this grief into rituals of mourning, breaking with apathy and creating empathy with ourselves and our environment (Mogyorósy, Urban Dialogues 2021). The twelve hours of the performance and the lack of keeping track of time allowed us to embrace the space. Silent guided tours, subjective map-making and lecture performances helped us dig deeper and unfold aspects of our own materiality and that of our environment. The extreme conditions—being awake for twelve hours in the cold and dark at an abandoned cemetery—filled the conversations with a unique bodily experience of our alleged or real concerns and preconceptions related to decay, losses, (climate) anxieties, and as we let them decompose, the ground below us allowed to sprout new beginnings.

Viktória Kaslik's lecture *Dandelion Feast: A Protocol to Eliminate Legal Waste from Earth Bodies* (2025) approached ecological questions through the legal and philosophical frameworks that shape our relationship to land. Challenging the Western notion of land as property and resource, the work invited audiences to reconsider anthropocentric systems of ownership and governance. Working at the intersection of law, artistic research, and systemic constellations, Kaslik explores how human-made legislation might be reimaged in dialogue with the “natural laws” that govern the complexity of our ecosystem. The project emerged from her encounter with the dandelion—a plant commonly dismissed as a weed despite its regenerative and detoxifying capacities—and culminated in a performative legal protocol in which, acting in her capacity as a jurist, she symbolically transferred the legal power she received from the nation-state to the dandelion (see Fig. 27). Through this speculative

gesture, the lecture invited audiences to imagine legal frameworks that recognise more-than-human agency and reposition Earth not as property, but as a living legal subject.

Micro-cruising (2024), the performative walk of Csilla Hódi, lutz&bog and Planty Warhol aimed to build an intimate relationship with three urban microbial oases of Budapest (Népliget, Sas-hegy, Bosnyák Market); places rich in microbial life. Cruising—or the use of the city’s hidden spaces in search of intimacy—is an open, receptive, almost ritualistic way of signalling one’s desire for contact. During the performative event, an audioguide was walking us through the spaces, inviting us to actively connect to environmental microbes, “expanding our inner map of Budapest, not only physically but also perceptually” (Mogyoróssy, 2024). The visibility-centered perception faded away, steps slowed down, smelling became alive, the skin became more porous, touch extended over the entire surface of the body, just to be with the microbial entities that cohabit our urban spaces. While we reached out for these invisible partners, with the help of our SensiWears we could also collect them and transport them to further destinations, supporting the diversification of the urban microbiome (see Fig. 28); which is decreasing since the Industrial Revolution due to the decline of proper nature contact (Parádi, Urban Dialogues 2024). While without proper laboratory equipment the microbial world is invisible to the human eye, combining science, art and technology, and a great deal of performative imagination, the project contributed to reducing microbial blindness⁴⁰ and made participants more attentive to the presence and importance of minute lifeforms.

MOME’s sound walk as part of their *Tolna Sound Garden* (2021) project, on the other hand, revealed the sounding nature of our city. Tolna Garden is a hidden pocket park in the Market Hall district of Budapest. The local municipality, paired with an NGO called Rév8, wanted to turn a closed community garden into a public recreational one managed by the local residents. MOME researchers started a collaboration with these institutions with the purpose of community organizing, and in the framework of their course “Happier City Action (Boldogabb város akció)”, students were designing small interventions to involve local residents in the process of placemaking, so that they can identify with and take care of it themselves. At the time of their participation in SENSING THE CITY, the project was in its initial phase. To attract people and popularize the garden itself, students and researchers chose to broaden the acoustic horizon of the garden with a sound microscope, sound sculptures, and an immersive soundwalk to amplify what is around (see Fig. 29). Previously, there have been various ways of communication to attract and engage locals, to monitor their needs and aspirations related to the place—knocking on their doors, interviews, messages on the garden’s small billboard or in the Facebook group, questions left on small flags in the raised beds—, but these artistic formats had the possibility for a different kind of engagement and possibility of noticing. Though in the beginning there were fears that artistic activities could scare people away, in reality the MOME team had several workshops and podcast recordings in the following years as well, and Tolna Garden is still open for the local community, managed by Rév8.

⁴⁰ derived from the concept of soil blindness



Figure 19. *Fuzzy Earth: Not Quite California Wonder*. 2021. Placc 2021, Budapest, Hungary. Photo: Attila Balogh



Figure 20. *Katalin Kortmann, Bálint Katona & András Kaprinyák: Fireworks*. 2021. Placc 2021, Budapest, Hungary. Photo: Attila Balogh



Figure 21. *Boglárka Jakabfi-Kovács: What You See. A Public Affair.* 2024. Placcc 2024, Budapest, Hungary. Photo: Attila Balogh



Figure 22. *Eva Bubla: Designated Breathing Zone 2.0.* 2023. Placcc 2023, Budapest, Hungary. Photo: Attila Balogh



Figure 23. *Eva Bubla: Designated Breathing Zone 3.0.* 2024. Placcc extra, Budapest, Hungary. Photo: Attila Balogh



Figure 24. *Eva Freund: Layers of Water.* 2024. Placcc 2024, Budapest, Hungary. Photo: Attila Balogh



Figure 25. *Anita Patonay & Viktor Bori: Water Level.* 2024. Placcc 2024, Budapest, Hungary. Photo: Attila Balogh



Figure 26. *SVUNG: No Endpoint.* 2021. Placcc 2021, Budapest, Hungary. Photo: Attila Balogh



Figure 27. *Viktória Kaslik: Dandelion Feast. A Protocol to Eliminate Legal Waste from Earth Bodies.* 2025. Placcc 2025, Budapest, Hungary. Photo: Attila Balogh



Figure 28. *Csilla Hódi, lutz&bog & Planty Warhol: Micro-cruising. Collecting the SensiWear.* 2024. Placcc 2024, Budapest, Hungary. Photo: Attila Balogh



Figure 29. *MOME: Tolna Sound Garden*. 2023. Placcc 2023, Budapest, Hungary. Photo: Attila Balogh

2.2.4 Lessons and Reflections

Given the focus and objectives of SENSING THE CITY, its projects—and participatory artistic practice in general—inevitably raise the question of *impact*. However, the difficulty of this kind of inquiry is that artistic interventions rarely produce immediate and/or measurable change. In the Hungarian independent art scene, this challenge is further amplified by the nature—and scarcity—of cultural funding, which hardly enables long-term engagement with specific communities.⁴¹ While sustained presence undoubtedly offers greater potential for systemic change, temporary interventions should not be dismissed for their brevity either, though. Within the recurring framework of SENSING THE CITY, artistic microinterventions collectively create an ongoing ecology of encounters that periodically reintroduces ecological questions into urban public space, reaching the festival's regular audiences and random passersby, and also foster dialogue through collaborations with organisations that have an integrated presence at certain locations, work with certain topics and communities (eg. Valyo, Rév8).

For this reason, my research is not concerned with measuring impact quantitatively but with understanding *how* and *why*⁴² artistic strategies generate ecological attentiveness, curiosity, or care. Throughout the program, projects revealed different modes of engagement and transformation that often unfolded simultaneously at emotional, cognitive, and social levels.⁴³

Some interventions expanded participants' perceptual horizons by making previously invisible ecological relations tangible. *Micro-cruising* introduced participants to the microbial life that surrounds and inhabits us, enabling many to perceive microorganisms as active components of urban ecosystems, while *Not Quite California Wonder* challenged romanticised imaginaries of agriculture by exposing the industrial realities of greenhouse production through multisensory listening. Beyond generating awareness, the projects also co-produced knowledge. Through artistic encounters, citizens gained insight into urban ecological processes—including waste and water management, greenhouse practices, climate futures, invisible microbiomes, existing and missing environmental policies—while artists, in turn, learned from participants' situated ecological knowledge, personal experiences, and local observations, allowing projects to evolve through dialogue rather than one-way communication.

Several works became platforms for conversations that extended beyond the artworks themselves. Visitors of *Designated Breathing Zones*, for instance, shared personal experiences of living with air pollution, discussed possible futures for urban environments,

⁴¹ In such a context, our program has been designed to host artistic *microinterventions* in years when grants are available. Even though it is common practice to work without an artist fee in the Hungarian fine art scene, we are determined to provide a budget that includes an artist fee and a modest production budget to distance ourselves from the exploitation of cultural workers. The scale and number of participating artists are always defined based on the available budget.

⁴² Qualitative impact refers to the non-numerical, descriptive changes in experiences, behaviors, perceptions, or outcomes resulting from an action, project, or intervention, focusing on how and why things change, rather than just how much. It captures nuances quantitative data misses, often gathered through stories, interviews, and narratives.

⁴³ based on the feedback of artists on audience interaction during and occasionally after the event, and my own observation notes and interactions with visitors

exchanged literature recommendations, and reflected on the role of nature in everyday wellbeing. The latest version of the installation gradually became an informal meeting point⁴⁴ and place of contemplation, where many returned simply to slow down, breathe, and experience air as both a living substance and a shared habitat. Other interventions addressed ecological questions through deeply personal and existential experiences. During the performative vigil, one participant described reaching what Szemessy (Urban Dialogues, 2021) calls a “survival threshold,” through which decades-long fears of death and abandonment gradually dissolved. In some cases, these experiences later translated into subtle behavioural changes. Some participants of *Water Level*, for example, reported becoming more conscious of their everyday water consumption, reconsidering seemingly insignificant practices such as pouring unused water into the sink instead of watering plants.

Equally valuable were those situations that revealed the difficulties and ambiguities of working in public space. Unlike gallery audiences, passersby encounter artworks in public space unexpectedly and with varying degrees of openness. Some engage, others remain indifferent, while some react with suspicion or resistance. One occasion at Boglárka Jakabfi’s *What You See: A Public Affair* demonstrated this complexity when a passer-by—outraged by the notion of public affairs—interpreted the installation as a party-political statement and attempted to damage it. While the incident prevented any meaningful conversation, it also illustrated how public space is never neutral but shaped by broader social and political contexts. Public affairs have become politically taboo in Hungary, and openness to dialogue itself culturally and politically situated.⁴⁵ However, rather than undermining the intervention, this incident revealed precisely why creating spaces for public reflection and dialogue remains essential.

These observations also demonstrate why evaluating participatory art through conventional metrics remains problematic. Should the success of an artwork be measured by the number of people it reaches, or by the depth of the encounters it facilitates? Can hundreds of brief interactions outweigh a handful of transformative conversations? Such questions resist definitive answers. The value of artistic engagement often lies precisely in its capacity to generate experiences that are difficult to quantify: moments of recognition, attentiveness, uncertainty, emotional resonance, or critical reflection that may continue unfolding long after the encounter itself.

This also distinguishes artistic practice from science communication⁴⁶ and environmental education. Although the projects presented here are grounded in scientific research and frequently developed in collaboration with experts, they do not merely communicate

⁴⁴ A visitor submitted the object to Google Maps; it became a regular spot for several citizens.

⁴⁵ My experiences within the IN SITU network—and my research trips related to my 2021/22 ÚNKP research “Participatory Artistic Practices in Public Spaces”—similarly suggested noticeable differences across Europe: while audiences in several Western European contexts generally appeared more accustomed to engaging with participatory artworks, audiences in Hungary and Kosovo often approached such situations with greater hesitation, uncertainty, or reluctance. As Florent Mehmeti, artistic director of HAPU Festival, observed, this hesitation frequently stems not from disinterest but from unfamiliarity with participatory artistic practices themselves.

⁴⁶ “The activity of explaining scientific work and information to people who are not scientists, or articles, talks, etc. that do this.” (Cambridge Dictionary)

scientific knowledge. Their purpose is not simply to inform, or communicate facts more effectively. They operate through aesthetic tension, ambiguity, and criticality (Bishop, 2006, p. 10-16), therefore, instead of merely illustrating and communicating scientific data, they intervene into ecological discourse, question and reframe how ecological issues are perceived, felt, and valued. In doing so, they indeed cultivate complex environmental competencies, enabling participants to understand the interrelations between ecological, social, political, and economic processes (Bubla, 2021), yet exceed educational goals by working through various imaginaries. While environmental education deals with the realities of how natural environments function, artistic strategies present playful, indirect means, often partly fictional worlds or distorted realities, with the intention to shake existing worldviews and engage people in a dialogue, often without any direct indication on how to function. Art raises questions and invites you to think together, but the audience brings home as much as it can handle in the moment, saving it from pressure and expectations (Bori, Urban Dialogues 2024).

My primary concern has therefore not been simply to identify the socio-ecological challenges confronting contemporary societies, nor to examine how they might be communicated more effectively. Rather, to explore how artistic strategies can render these challenges perceptible, tangible, and experientially meaningful for public audiences. Yet making ecological crises sensible is only one part of the process. Equally important is the question of how these crises are framed, whose perspectives determine what becomes visible, and what kinds of relationships are made imaginable through artistic practice. If art has the capacity to reshape ecological perception, then it also has the capacity to challenge anthropocentric ways of seeing and to make space for other forms of agency and coexistence.

3 MORE-THAN-HUMAN ECOLOGIES

3.1 Reimagining Relations Across Spaces and Species

The ecological crisis is often presented as an issue of insufficient awareness: if we only knew more, saw more, or felt more, we might respond differently. This assumption has driven a proliferation of artistic endeavors that aim to make urgent issues more visible; yet, visibility in itself is not enough. To raise awareness is always to frame a problem—and framing is never neutral. Whose perspective determines what is recognized as a problem? Which voices are amplified, and which remain unheard? And perhaps most importantly: what forms of life are acknowledged as stakeholders in the first place?

Ecosystems are often understood in human-centered frameworks, valued according to the services they provide to humans, their economic or recreational value, or their significance for human wellbeing. Even well-intentioned discourses and debates frequently position non-human beings as passive objects of concern rather than active participants in ecological processes. Ecological thinking, however, “entails transcending human-centered exceptionalism, no longer placing ourselves at the center of the universe and viewing nature as a source of endless bounty” (Demos, 2016, p. 19). Ecological issues do not concern humans alone, nor can they be adequately understood through exclusively human perspectives. Instead, they demand attention to the multiple forms of life whose existence is intertwined with our own.

“The deepest cause of the present devastation is found in a mode of consciousness that has established a radical discontinuity between the human and other modes of being and the bestowal of all rights on the humans” (Berry, 1999, p. 4, as cited in Escobar, 2016, p. 27). As Escobar (2016, p. 28) argues, “we, moderns, have lost our integral relation with the universe, and must restore it by bringing about a new intimacy with the Earth.” We are in urgent need of new stories, new perspectives that reunite the human and the non-human. In contrast with anthropocentrism and the human-nature divide experienced in the Global North, various wisdom traditions, especially those from indigenous cultures, emphasize that humans are integrated with the Earth and share in its consciousness, rather than being isolated beings in a lifeless environment. Earth is understood as a communion of subjects, not a collection of objects (Berry, 2013, p. 4, as cited in Escobar, 2016, p. 28).

Such perspectives resonate with Karen Barad’s theory of agential realism, which challenges the separation of active human subjects from a passive natural world. Through the concept of *intra-action*,⁴⁷ Barad proposes that entities do not pre-exist their relations but emerge through them, with relations and entities mutually constituting one another. Matter, accordingly, is not

⁴⁷ There is a distinct difference between interaction and intra-action. When two bodies interact (inter = among, in the midst of), they each maintain a level of independence, while through intra-actions (intra = within), agency—the ability to act—emerges from within the relationship, not outside of it. This reconfigures our understanding about relationships with each other, with nature, with materials, and discourses: it implies relinquishing cause-and effect relationships, individual agency and subject-object dichotomies, redistributing responsibilities among the interrelated entities, and realizing that ethics and justice are not things that are predetermined but that are always changing and unfolding. Intra-actions challenge fixed boundaries, borders and linear time, and consequently, help us think in terms of simultaneity.

passive or inert but an active participant in the world's ongoing becoming (Alonso, 2024, p. 1). This relational understanding unsettles binary distinctions between subject and object, human and non-human, and nature and culture, offering instead an understanding of the world as interconnected and continuously becoming.

Donna Haraway extends this relational understanding through her concept of *sympoiesis*, or “*making-with*,” which understands all life as co-produced through interdependent relations. Existence, in this sense, is never autonomous but always collaborative, unfolding across species and systems. “Who and whatever we are, we need to make-with—become-with, compose-with—the earth-bound”, as all earthlings are kin in the deepest sense, beyond ties of ancestry and genealogy, and “it is past time to practice better care of kinds-as-assemblages (not species one at a time)” (Haraway, 2016, pp. 102-103). Such a perspective, again, shifts attention away from isolated individuals toward *assemblages* of interconnected beings whose lives unfold together.

This relational ontology also transforms how *care* is understood: it must be expanded beyond human-centered ethics and notions, and approached as a material, affective, and political practice that allows more-than-human worlds to thrive. Care, in this sense, is a mode of attention and responsibility—or *response-ability*—that involves responding to complex, often conflicting relationalities, dependencies and interdependencies (de la Bellacasa, 2017, pp. 5-6). It requires more than concern for nature in the abstract. It demands engagement with the concrete relationships through which humans, soils, plants, animals, fungi, microorganisms, and technologies become implicated in one another's existence.

This is where artistic practice becomes particularly significant. If ecological crises emerge through relational entanglements, art cannot limit itself to representing issues from human perspectives alone. It must also experiment with ways of attending to more-than-human agencies and exploring forms of coexistence that exceed anthropocentric frameworks. Artistic practice can create situations in which alternative perspectives become perceivable or imaginable, where overlooked relationships come into view, and where ecological questions are approached not only as human concerns but as matters involving diverse forms of life. Public art, in particular, has the potential to function as a space in which multiple actors encounter one another and where dominant assumptions about who counts as a stakeholder in ecological matters can be challenged. Public space is not simply a neutral site for displaying or presenting artworks, but a dynamic relational field in which bodies and discourses continuously intra-act.

Several artistic interventions discussed in the previous chapter offer compelling examples of these relational and more-than-human approaches in practice. Fuzzy Earth's *Not Quite California Wonder* (2021), for instance, constructs a speculative narrative around the bell pepper (*Capsicum annuum*) as a more-than-human protagonist, allowing the plant to “speak” through storytelling, audiovisual installation, and spatial experience. By shifting the bell pepper from the position of commodity to that of an ecological and political actor, the project challenges anthropocentric hierarchies and foregrounds the entangled relations between agriculture, consumption, labor, and environmental transformation. Similarly, the

Micro-cruising (2024) project of artists Csilla Hódi, Iutzz&bog and Planty Warhol invites participants to encounter urban environments from the perspective of microorganisms and invisible ecological processes. Through embodied, sensory forms of exploration, the project destabilizes dominant scales of perception and encourages attentiveness to forms of life and agency that usually remain imperceptible within human-centered experiences of public space. A similar strategy informs my own installation *Designated Breathing Zone 3.0* (2024–2025), which temporarily suspends habitual perceptions of the urban atmosphere by inviting participants to experience breathing from the perspective of air itself. Rather than treating air as an invisible backdrop, the work positions it as a living, shared medium whose material condition shapes both human and more-than-human existence. Likewise, Viktória Kaslik's *Dandelion Feast: A Protocol to Eliminate Legal Waste from Earth Bodies* (2025) employs speculative imagination to shift perspective towards the dandelion, asking what forms of law might emerge if legal authority were no longer dictated solely by humans but by the ecological intelligence embodied in the plant. In each case, these artistic propositions do not claim to literally represent more-than-human perspectives; rather, they methodologically construct imaginative frameworks through which participants may temporarily inhabit alternative modes of perception and reconsider established anthropocentric relations, historical, ecological, and political entanglements.

Jonas Staal's parliamentary projects also represent a relevant extension of more-than-human thinking into the political sphere. Particularly in projects such as *Assemblism* (2017) and *Interplanetary Species Society* (2019), Staal questions who is granted representation within dominant political systems and imagines forms of assembly that include nonhuman and more-than-human actors. [*Interplanetary Species Society* \(2019\)](#), for example, stages a speculative biosphere in which humans, plants, meteorites, and extinct species coexist as political participants, proposing new forms of “comradeship” across species boundaries (see Fig. 30). In this sense, Staal's work resonates strongly with posthuman ecological thought by expanding the notion of political voice and collective agency beyond the human, while using artistic practice to prototype alternative modes of coexistence, governance, and shared world-making.

Johannes Bellinkx, to carry out his artistic research in preparation for his project *What's it Like to Be Another Living Creature: Chapter Tree*, constructed a platform ten meters high on a plane tree. Alternating between structured exercises and moments of open sensory attention, Bellinkx approached the tree not as an object of observation, but as a situated perspective through which to experience the world differently. I also had the opportunity to spend several hours alone on the platform, allowing us later to exchange reflections on the experience. The project functioned as a speculative embodied experiment aimed at temporarily displacing anthropocentric modes of perception and imagining what it might mean to inhabit the world from the perspective of a tree.

Other works do not construct imaginaries of more-than-human life but create a situation in which their agency and ecological significance become experientially present. Tamara Henderson's [*Worm Affair*](#) (2023) positions earthworms as active co-creators within the

ecosystem. Installed around a living compost system, the artwork transmits a live audio feed of compost worms as they transform decaying organic matter into fertile soil (see Fig. 31). Through contact microphones and sound amplification, the worms' otherwise imperceptible movements, digestion, and labor become audible, drawing attention to the vital ecological processes taking place beneath the surface.

Despite their different artistic approaches, these projects share a common commitment: they seek to make more-than-human agencies perceptible without reducing them to mere metaphors or representations. By mobilizing diverse methodologies, they open space for alternative ways of sensing, imagining, and relating, ultimately expanding the perceptual and conceptual horizons through which ecological coexistence can be understood. Their contribution lies not in representing more-than-human worlds, but in inviting audiences to inhabit them differently.



Figure 30. *Jonas Staal: Interplanetary Species Society*. 2019. Reaktorhallen, Stockholm, Sweden. Photo: Ricard Estay



Figure 31. *Tamara Henderson: Worm Affair*. 2023. Helsinki Biennial 2025, Vallisaari Island. Photo: HAM / Helsinki Biennial / Sonja Hyytiäinen

3.2 Case Study: Gudebergjordet Protection Agency

Land areas are decreasing rapidly in urban environments. Changing climatic conditions, soil loss, population growth and political unrest threaten food security globally. The world grows 95% of its food in the uppermost layer of soil, making topsoil one of the crucial elements of our food system. However, over the past 150 years, half of premium quality topsoil has disappeared due to conventional farming practices—risking crop yields and contributing to erosion, degradation of microbial life, loss of biodiversity, and nutrient pollution. According to Maria-Helena Semedo of the UN’s Food and Agriculture Organization, if we continue at this rate, the world could run out of topsoil in little more than half a century (Cosier, 2019). This would severely damage the earth’s ability to filter water, absorb carbon, and feed people.

Norway is well-known for its abundant nature and boreal forests covering most of its area. Less widely recognized, however, is the fact that only 3% of its total territory is arable land, making it one of the least self-sufficient countries in Europe in terms of food production (Nordic Council of Ministers, n.d.). This makes fertile agricultural areas a treasured national value. One such place is Gudebergjordet, a monoculture farm that currently grows grains for feeding livestock, surrounded by industrial land, residential houses, a tiny lake and reed beds in Fredrikstad, a southeastern town of Norway. Gudebergjordet has been part of the city’s fields since Fredrikstad was laid out in 1567 and the land has most likely been used for food production even long before that (Ulfeng, 2019). Its premium quality topsoil consists of silty-fine sand and silty loam that was deposited in the sea and raised above sea level after the ice retreated.

Despite its long history and its agricultural significance, Gudebergjordet remains largely absent from the everyday consciousness of local residents. Although the field lies at the heart of the city, many people pass by it without considering its role in sustaining life. For many inhabitants, it functions primarily as a backdrop within the urban landscape rather than a living part of the local ecosystem and food culture. In 2022, invited by Østfold Internasjonale Teater (ØIT) to a research residency related to their upcoming triennale,⁴⁸ I became interested in this disconnect between the land’s ecological and cultural significance, and its limited presence in the public imagination and practices. My challenge was not simply to raise awareness of Gudebergjordet, but to create opportunities for people to encounter it differently—to foster new forms of attention, attachment, and responsibility toward a place that has long sustained life, yet remains largely overlooked.

⁴⁸ The curatorial concept of James Moore (ØIT) built on David George Haskell’s book titled “The Forest Unseen”, in which the biologist author gave an account on his investigations into the local ecosystem by setting up small circles of observations. For the triennial, the circle was planned to be expanded for as big of a radius as 30 km around Fredrikstad, to give space for various artistic explorations and interventions in the diverse ecological setting of the city and its surroundings.

3.2.1. Resting with the Land - A Relational Experiment

If my ambition was to create opportunities for others to develop a deeper relationship with Gudebergjordet, I first needed to cultivate such a relationship myself. My initial research visits focused on meeting local citizens, organizations, experts, and the farmer who rents and cultivates the organic monoculture field. Through interviews, conversations, and site visits, I gradually familiarized myself with the social, ecological, and historical dimensions of the area. Based on these encounters, an early vision emerged: to transform part of this monoculture into a biodiverse *kincentric garden* developed in collaboration with local partners (see Fig. 32). Such a garden would not only create opportunities for local food production—extended to human consumption—but also reconfigure how we relate to the land itself, building on a sense of kinship between human and more-than-human communities and creating a microecosystem that supports biodiversity and multispecies coexistence. The ambition was not simply to establish a different model of cultivation, but to create a garden practice that, while recognizing the rarity and importance of fertile soil, moves beyond viewing land solely through the lens of productivity—as a resource. Instead, it approaches the land as a collaborator in a shared ecological process. My starting point was therefore the idea of a public garden within an artistic-curatorial framework that combines cultivation, care, reciprocity, strengthening people's connection to land.

Yet despite the wealth of information gathered through interactions with local experts, I increasingly felt that something essential was missing. I had accumulated knowledge about the place, but I had not yet entered into a meaningful dialogue with it. If the project was to emerge from the specificities of Gudebergjordet rather than be imposed upon it, I needed to spend time with the land itself. Rather than approaching it as a site which I 'colonize' by artistic objects and aspirations alien to the location, I wanted to attune to the assemblages of lifeforms, humans, plants, animals, soil, weather, and agricultural practices that constitute its everyday life.

To deepen this process, I undertook a month-long residency in a caravan situated directly on the field (see Fig. 33). The residency became an immersive form of artistic research dedicated to sensing and relating to the landscape. Through long-term presence, environmental listening, walking, observation, embodied exercises, and moments of stillness, I sought to inhabit the site and allow its ecological processes to gradually reveal themselves. At the same time, I designed a series of scores, participatory activities that invited local residents to join this process of attunement (see Fig. 34 and Appendix A). The project that emerged therefore grew out of the relationships, observations, and insights generated during this period of 'being with', 'resting with', 'becoming with' and essentially 'learning with' the land.

To maximize immersion, I began the residency with five days of 'noble silence'.⁴⁹ I completely refrained from speaking and turned off all electronic devices. Silence functioned both as a practical and methodological tool. By reducing human-centered forms of

⁴⁹ Noble silence is a contemplative practice—originating from Buddhist traditions—where a person consciously refrains from any form of communication as an active discipline meant to calm the mind, cultivate inner peace, deep presence and listening. I have practiced it in Buddhist monasteries while living in Asia, and applied it here as a form of artistic gesture.

communication and the constant pull of information, it became possible to direct attention toward the site as a living entity itself. The first days were occupied by the immediate realities of living on the land. The caravan required careful management of water, energy, and waste. Water used for washing could be reused for flushing the toilet, water left over from cooking—when no salt, spices, or other additives had been used—could nourish seeds planted around the caravan. Everyday maintenance gradually became part of the research process itself.

As the silence deepened, observation expanded beyond the immediate surroundings. I established a series of recurring observation points across the site, where I spent time at different parts of the day—listening, watching, and reflecting. These sessions were informed both by scientific understandings of soil ecology, plant communication, microbial life, and biodiversity, while relational and more-than-human ontologies encouraged me to consider how knowledge might also emerge through immersive, embodied presence and encounters.

Visitors were invited to participate in this process as well. Rather than offering guided tours or predetermined interpretations, I designed simple *scores*, some concrete and some rather poetic ones, that encouraged silent exploration and sensory engagement. Participants were invited to slow down, root with trees, photosynthesize, harvest clouds, follow olfactory signals, observe lifeforms, listen, touch, or simply rest and spend time with the land. There was an old couple who tried to act out their thoughts and impressions, while others silently followed the score. A mother with a toddler played with the soil below their feet, touching it, rubbing it, and making friends with it—indirectly stepping over the misconception of soil as dirt but exploring it as a living matter. These practices sought to create conditions for attentiveness while indirectly delivering certain information on local ecologies, or noticing a lack, providing opportunities for citizens to develop their own relationships with the site and the assemblages of more-than-human life that inhabit it.

An important aspect of the research involved moving between observation and multispecies imaginaries. While certain aspects of the landscape can be studied through ecological science, other forms of understanding require imagination and interpretation. Attempting to relate to non-human beings inevitably involves speculation: we can observe a bird, study soil microorganisms, or learn about plant physiology, but we can never fully access their experience of the world. Rather than viewing this limitation as a failure, I approached speculation as a methodological tool for expanding empathy and attention beyond the human.⁵⁰ Speculative exercises allowed me to explore possible perspectives of the land, the soil, the plants, and other inhabitants of the site, not as claims of factual knowledge, but as invitations to think with and alongside them.

⁵⁰ Such an approach requires challenging deeply ingrained assumptions of human exceptionalism. As Taylor (2016:8) argues, thinking with the more-than-human demands that we relinquish the certainty that humans are the only knowing subjects while the non-human world merely serves as the object of our knowledge. This shift does not happen automatically; it requires what she describes as a form of apprenticeship, a sustained practice of attunement to the agencies, relations, and processes already unfolding beyond the human. Echoing Latour's notion of "learning to be affected," this process involves cultivating sensitivity to how landscapes, plants, animals, weather systems, and other ecological actors shape and transform our perceptions. At the same time, it requires a degree of unlearning: letting go of habitual ways of thinking that position humans as the sole bearers of knowledge and agency.

Over time, external observations began to intertwine with internal sensations, memories, and imaginative responses. The landscape was no longer experienced solely as an object of study, but as a participant in an ongoing dialogue. One evening, while I was watching over the freshly plowed land, my body suddenly ‘dissolved’ into soil and a strong sensation of motherly feeling appeared to me, as if I could hear the land talking: “Here I am, naked, covered in holes from hot metals. I lay here wide open, ready to create a home for the seeds of future generations. I can bear it. I can bear everything. I can bear even the unbearable. Can I? Do I ever stop—to take a rest? Am I allowed to? After all, I need to take care of countless hungry mouths. I am here to feed. I am here to give. Are my resources endless? How fertile is my womb? I ask you, all those tiny creatures of the micro realm, [bacteria, protozoans and fungi,] who constitute me: how do you feel? (...) Mothers are scarce creatures here in the North. There are so many without one, having to travel long distances to find one. I cannot just stop giving. I am needed. Micro-allies, I need you. You are my health. Whirling worms, I need you. You soften my flesh. Green allies, I need you. You cover my skin. You protect me from burning. You keep me hydrated. Seeders, I need you. I need you to listen and feel me. I need you to take good care of me. Be gentle. Feed me well so I can feed you.”⁵¹ This dialogue was grounded simultaneously in observation, ecological knowledge,⁵² embodied experience, and speculative imagination.

Visitors’ reflections revealed similarly varied forms of engagement with the landscape. Some described an intensified awareness of other forms of life: “I can hear it whispering in the wind. A silent choir singing to me the story of life,” while another wrote that “it is also very quiet and just the nature speaking, and the small creatures.” Others began to speculate from more-than-human perspectives, asking, for instance, “Is a tree ever young/old?” or imagining how “the earth below me might see me.” Several responses reflected on interdependence and human impact, including one participant who observed that the place was “missing trees” and “wild animals,” concluding that “we have to start growing back trees, bring animals back to their habitats.” Others recorded more embodied experiences of stillness and belonging: “I felt the wind on my skin,” and “all of my thoughts and problems just left. I felt like a part of me was a part of it.” These reflections were highly individual, but collectively suggest how presence, sensory attention, and speculative exercises could open different ways of noticing and relating to the place.

Together, these approaches formed the methodological foundation of the residency and ultimately informed the development of a project that sought not only to represent Gudebergjordet, but to cultivate new relationships between people, land, and the more-than-human communities that call it home.

⁵¹ Excerpt from my field notes at the research residency.

⁵² The intensive agricultural practices introduced during the Green Revolution in the 1950s and 1960s—including deep ploughing, synthetic fertilization, and widespread pesticide use—significantly increased crop yields but also accelerated soil degradation. According to soil scientist István Parádi (Urban Dialogues, 2024), these practices have substantially reduced the depth of fertile humus layers and depleted soil biodiversity, weakening the biological processes that maintain soil structure. Regenerative agriculture seeks to reverse these trends by minimizing soil disturbance, increasing plant diversity, maintaining continuous soil cover, and implementing crop rotation to restore microbial and fungal communities essential for healthy soils.

3.2.2. Gudebergjordet Protection Agency

The weeks spent on Gudebergjordet revealed the ecological significance of the site as well as the complexity of relationships that sustain it: fertile soil shaped over millennia, microorganisms and vegetal bodies inhabiting it, agricultural practices, deers, birds and beavers in the surrounding reed beds, local residents, farmers, and countless other visible and invisible actors. From these experiences, the concept of the *Gudebergjordet Protection Agency*⁵³ emerged as an artistic-curatorial framework to contain these multiple perspectives and allow them to thrive.

At its core, the project is built around the—burdened—notion of *protection*. Protection, however, is understood here as something far more expansive than the preservation of a physical territory by the human “rescuer and knower of all” (Taylor, 2016, p. 6). While preventing future construction, urban expansion, or ecological degradation are crucial concerns, protection is approached as an ultimately relational, ecological, and cultural practice. It involves creating the conditions through which diverse forms of life can continue to coexist, regenerate, and participate in the ongoing making of the place.

The idea developed partly through interactions with local ecologist Randy Gunnar Lande and ornithologist Bjørn Frostad, who discussed the possibility of rewilding the area and granting protected status to the surrounding wetlands. While such a strategy could help preserve biodiversity and prevent future development, it also raised questions regarding the agricultural significance of Gudebergjordet. Given the scarcity of arable land in Norway, protecting the site should not necessarily imply removing cultivation from it. Instead, the challenge became imagining forms of protection capable of embracing both agricultural activity and ecological diversity. Could fertile agricultural land be protected not only as a site of production but also as a living multispecies habitat? Could food cultivation itself become a practice of care for human and more-than-human communities alike?

The Agency proposes one possible response to these questions. Conceived as a fictional organization, it functions as an experimental platform for land-based activities—a place for art but what challenges its boundaries—, advocating for the rights and wellbeing of the entire ecosystem of Gudebergjordet: its soil, waters, plants, animals, fungi, microorganisms, and human inhabitants. Particular attention is given to the fertile topsoil itself, which curator and producer James Moore identified as one of the site’s most valuable yet overlooked protagonists. While discussions of environmental protection often focus on charismatic species or visible landscapes, the Agency extends care toward the living soil community that makes other forms of life possible.

The project is informed by emerging discussions around the rights of nature and more-than-human legal frameworks. While environmental rights have increasingly been recognized in legislation around the world, these frameworks often remain rooted in human interests. Section 112 of the Norwegian Constitution states that “Every person has the right to

⁵³ The title served as a working title, while the underlying meaning of *protection*—and consequently the conceptual nuances of the project itself—continued to evolve throughout the research process.

an environment that is conducive to health and to a natural environment whose productivity and diversity are maintained. Natural resources shall be managed on the basis of comprehensive long-term considerations which will safeguard this right for future generations as well.” Similarly, the UN General Assembly adopted a historic resolution in 2022, declaring access to a clean, healthy and sustainable environment, a universal human right (United Nations News, 2022). While these developments are significant, they continue to position nature primarily in relation to human wellbeing. The Agency asks a different question: how can we challenge anthropocentrism and human supremacism and unfold what it means to recognize the rights, needs, and agencies of the land itself? How might political and cultural frameworks change if soil organisms, animals, vegetal and environmental bodies, and future generations of human and more-than-human inhabitants were treated not as resources or objects of management, but as participants in a shared ecological community?

In this sense, the Agency functions as an experiment in articulating more-than-human voices. Not because it claims to speak on behalf of non-human beings, but because it seeks to create situations in which their presence, needs, and agencies become more perceptible within public discourse. Through storytelling, workshops, artistic interventions, gardening activities, environmental listening, and speculative exercises, the project attempts to expand the range of perspectives considered in discussions about the future of the site. Following post-human and multispecies approaches, it understands advocacy not as representation alone but as the cultivation of relationships that enable humans to become more attentive and responsive to the worlds they inhabit.

The caravan spot that served as my temporary home during the residency gradually became imagined as the Agency’s future headquarters. Positioned directly on the field, it could function as a meeting place, information center, listening station, and gathering point for artistic and community-based activities. Around it, a biodiverse kincentric garden, workshops, installations, public campaigns, and citizen-led initiatives could emerge, collectively forming an ecology of care.

The development of Gudebergjordet Protection Agency had already moved beyond the conceptual stage when the project was unexpectedly halted due to the cancellation of the overall funding for the triennale within which it was to be realized. Prior to this decision, I facilitated two workshops with local citizens and stakeholders, as well as two workshops with schoolchildren, introducing the concept of the Agency and inviting participants to engage in the embodied mapping exercises with collective reflection on topics such as land use, land rights, soil health, care, ecological restoration and protection, and the cultural assumptions that shape our understanding of the place, or nature in general (see Fig. 35–37). Rather than presenting a fixed proposal, the workshops sought to establish a collaborative process through which the future of Gudebergjordet could be imagined collectively from both human and more-than-human perspectives. Although the larger project could not proceed as planned, the conceptual framework of the Agency remains intact.

It is important to acknowledge such interruptions and unfinished trajectories, as uncertainty and discontinuity are intrinsic to socially engaged and participatory artistic practices. When

projects are embedded in complex social, institutional, and economic contexts, postponements, transformations, and cancellations are always possible outcomes. Yet this does not necessarily signify the end of a project. Oftentimes, ideas enter a period of suspension, later reappearing in new forms, locations, or collaborations. The lessons generated through these interruptions frequently become an integral part of the work, shaping its future development and enriching its conceptual and methodological foundations. The Agency, as an artistic-curatorial model for multispecies advocacy, ecological storytelling, and land-based participation, retains the potential to be further developed and adapted to other locations facing similar questions and futures.



Figure 32. Artist talk by Eva Bubla to introduce the project. IN SITU Focus Seminar 2022. Østfold Internasjonale Teater, Fredrikstad, Norway. Photo: ØIT



Figure 33. Eva Bubla: *Resting with the Land*. 2023. GudebergjorDET, Fredrikstad, Norway. Photo: Eva Bubla



Figure 34. *Eva Bubla: Resting with the Land. Interaction cards.* 2023. Gudebergjordet, Fredrikstad, Norway.
Photo: Eva Bubla



Figure 35. *Eva Bubla: Resting with the Land*. 2023. Gudebergjordet, Fredrikstad, Norway. Photo: Ida Willassen



Figure 36. *Eva Bubla: Resting with the Land. Public workshop. 2023. Gudebergjordet, Fredrikstad, Norway.*
Photo: Ida Willassen



Figure 37. *Eva Bubla: Resting with the Land. Public workshop. 2023. Gudebergjordet, Fredrikstad, Norway.*
Photo: Ida Willassen

4 FUTURE ECOLOGIES

4.1 Reimagining Futures

The urgency of the socio-ecological crises of our time has intensified the need not only to critique the present, but to actively imagine, negotiate and (pre-)enact⁵⁴ alternative futures. Climate change, biodiversity loss, environmental degradation, social inequalities, technocentric transformations and the idea of unlimited growth increasingly challenge inherited assumptions about how societies should organize themselves and relate to human and more-than-human worlds. Under such conditions, engaging with the future becomes both difficult and necessary. Futures are neither fully knowable nor entirely controllable; they are uncertain, contested, and shaped by a complex interplay of human and non-human forces. The only certainty is that our present practices cannot be sustained any longer. While the future of our planet cannot be predicted, it can be discussed, explored, and to some extent influenced through actions in the present. Futures thinking therefore—similarly to climate models—begins from the premise that there is not one predetermined future but multiple possible futures, some more plausible, desirable, or just than others, and that collective action plays a role in shaping which futures emerge (Kuzmanovic & Gaffney, 2019).

The capacity to imagine alternative modes of being and acting in the world, however, is unevenly distributed and frequently constrained by the dominant ideological frameworks of the present. Futures are political terrains shaped by inequalities concerning who is permitted to imagine, articulate, and participate in shaping what comes next. The modern/colonial worldview has historically privileged a singular model of development and progress while marginalizing alternative ontologies, epistemologies, and ways of inhabiting the world, thereby narrowing the horizon of imaginable futures (Escobar, 2016, p. 15). As Mark Fisher (2009, p. 2) argues, capitalism has become so deeply embedded within social consciousness that it severely limits our ability to envision any viable futures beyond its logic of profit and perpetual growth, producing a condition in which systemic change appears impossible and even the end of the world seems more conceivable than an alternative to capitalism itself. Reclaiming imagination therefore becomes a political and cultural task in order to reopen the space of the possible. As Spivak (as cited in Varga, 2019, p. 78) argues, the cultivation of social imagination is essential for thinking beyond dominant epistemologies and creating the conditions through which transformation may arise.

Such concerns strongly resonate with Donna Haraway's notion of '*worlding*'. Haraway reminds us that futures emerge through situated practices of storytelling, relation-making, and material engagement: "It matters what matters we use to think other matters with. It matters what stories make worlds, what worlds make stories. What knots knot knots, what thoughts think thoughts" (Haraway, 2016, p.12). Likewise, Rosi Braidotti's affirmative posthuman ethics provides a framework for thinking towards futures beyond anthropocentrism, grounded

⁵⁴ Kuzmanovic and Gaffney (2017, p. 108) distinguish between prehearsals and pre-enactments as two forms of experiential futuring. Prehearsals are short improvisational exercises that can be incorporated into scenario workshops and other futures processes, whereas pre-enactments are more immersive situations, lasting from several hours to days or weeks and often involving costumes, props, and other elements through which possible futures can be temporarily inhabited and experienced.

in an expanded sense of interconnection between humans, non-human others, and their shared environments (Braidotti, 2013, pp. 190–193). Reimagining future ecologies therefore requires not only new scientific knowledge but also new narratives, metaphors, and imaginaries capable of reorganizing how humans perceive their place within multispecies worlds and, consequently, how they choose to act within them. Futures are not external destinations waiting to be reached, but ongoing processes of world-making.

Within this broader landscape, artistic practice offers distinctive methodologies for cultivating future ecologies. Art has long functioned as a site of experimentation, imagination, critique, and alternative world-making (Demos, 2016, p. 18). Rather than merely representing existing realities, artistic practices can create situations in which different realities become imaginable, tangible, and experientially accessible. Speculative artistic practices are especially significant in this regard because they allow possibilities to be explored without requiring their immediate feasibility or implementation.⁵⁵ As Annette Arlander (2017) argues, artistic research can itself be understood as a form of speculation through practice, in which artistic processes create conditions for alternatives to emerge. Art can thus become a method for testing relations, materialities, and modes of inhabiting the world that may not yet fully exist, but can nevertheless be temporarily enacted and collectively experienced. Similarly, Anthony Dunne and Fiona Raby (2013, pp. 2–7, 34–35) propose speculative design as a means of creating fictional scenarios and artefacts not to predict the future, but to provoke reflection, discussion, and alternative forms of social imagination. Speculation therefore functions as a critical practice through which present assumptions and practices can be questioned and different alternative possibilities can be imagined, negotiated and rehearsed.

⁵⁵ While I am interested in and motivated by artistic experimentations, ‘do-it-ourselves’ or ‘do-it-with-others’ projects that test alternative futures as localized small-scale *utopias**, the present subchapter is focusing on the speculative dimensions of future-making, and possibilities of further implementation will be discussed in a later part of the chapter. Speculative future-making resonates with Ruth Levitas’s concept of *utopia as a method*, where utopia is understood not as a blueprint but a method: a holistic, provisional, reflexive, and dialogic approach to developing possible futures (Levitas, 2013). As she explained during the plenary session “*Why We (still) Need Utopian Thinking Now*” at the conference titled Undisciplining II (2024), utopia as a method is holistic in fostering the interconnectedness between economic, social, existential, and ecological processes, insisting that current societal structures, norms, and behaviors are neither inevitable, natural, nor necessary, but historically contingent and therefore changeable. It is provisional in acknowledging that all imagined futures are incomplete and flawed, and as such, a utopia can never be a fixed endpoint but a process. It is reflexive in recognizing that imagination is shaped and limited by present conditions and social positionalities. And it is dialogic in remaining open to critique, multiplicity, and previously unthought voices. Therefore, at the core of utopia as a method lies not the realization of imagined places, but the process of imagining as a method. Utopia, therefore, becomes less a destination than a collective process of exploring alternatives, interrogating existing systems, and rehearsing possible modes of coexistence. These speculative futures may never be fully achieved, yet their value resides in prompting us to think, to dream, and to begin moving, allowing transformation to emerge through situated experiences. This also responds to the tension, identified by Fisher, between the seeming impossibility of systemic change and the necessity of imagining it: utopian thinking persists not as naïve optimism, but as a critical practice that resists the foreclosure of alternatives. It entails both critique and proposition, exposing the shortcomings of existing systems while offering tangible glimpses of alternative realities, thereby widening the horizon of the possible. The focus shifts from grand, universal visions toward grounded, relational ways of world-making.

*Utopia, derived from the Greek word *outopos* (“no place”) but playing with the pronunciation of the word *eutopos* (“good place”), is the creation of imaginary good places. In 1516, English humanist Sir Thomas More published a book titled *Utopia*, which contrasted the social and economic conditions in Europe with those of an ideal society on a fictional island—called Utopia—located off the coast of the Americas. The name, crafted by merging the Greek words *ou* (“not, no”) and *topos* (“place”), wanted to imply that the perfect conditions on his imaginary island could never truly exist. In its modern use though, especially since the introduction of the term dystopia in 1844, utopia refers to an ideal place or society.

It is in this sense that artistic futuring methodologies become particularly valuable. Through workshops, performances, installations, role-playing exercises, speculative artifacts, fictional narratives, and participatory encounters, artistic projects create temporary spaces in which alternative futures can be collectively explored and embodied.

The [*Manual of Adaptation to the Planet*](#) (2020-) by LUIT (Laboratoire Urbain d'Interventions Temporaires), for instance, invites local inhabitants and passers-by to collectively reconfigure future modes of living in response to the climatic and political changes of their territories.⁵⁶ The participatory performance is framed as an ongoing expedition led by the “Adapters,” who have set out to help the people of the future by creating a manual for life on Earth. The work engages participants in a speculative time-acceleration scenario where small groups inhabit successive future generations (e.g. in 2050, 2100, 2150), each living—and acting out—50 years in 50 minutes. Through immersive guided simulations, collaborative decision-making, and role-playing within a geodesic dome installation, citizens are tasked with designing adaptive strategies for survival: deciding what to preserve, abandon, or (re)invent in response to evolving ecological and social pressures (see Fig. 38). Each group leaves behind traces and messages for the next, creating a cumulative, intergenerational manual of adaptation. By blending artistic gestures of performance, participatory theatre, game mechanics, and collective storytelling, the project transforms climate futures into a shared, embodied experience that stimulates imagination, fosters dialogue about the present, and prototypes forms of communal resilience.

[*Climaginaires*](#), a platform of researchers and artists, investigates possible environmental futures through the creation of immersive encounters—soundwalks, speculative museums, storytelling projects and participatory workshops—that facilitate people to step into possible futures and reflect on how societies might change in a warming and changing planet. Their exhibition *Carbon Ruins* (2019-) takes us to 2053, the year in which the Swedish government has just opened its landmark museum FOSSIL as a celebration of reaching global net-zero emissions of carbon dioxide in 2050.⁵⁷ It showcases recognizable objects and associated climate stories to citizens of post-fossil societies (see Fig. 39). All stories are based on climate models and expertise from the Narrating Climate Futures network, while the stories’ characters and events have been developed through workshops with the participation of researchers and practitioners in food, transport, steel, energy, and plastic.⁵⁸

The immersive pop-up installation of the Dust Institute, called the [*Dust-free Chamber*](#) (2021), forecasts an *air utopia* through sound installations and a guided meditation, enabling citizens to breathe air completely free of airborne dust, pollen, odours and viruses. *Dust Collection workshops* also create an opportunity for participants to explore different types of dust

⁵⁶A team is searching for adaptation strategies to methodically reorganize human life on Earth. Page by page, they are traveling the globe to write a handbook on adaptation, because according to their predictions, the concept of the state will have disappeared by 2040, and every community, every neighborhood, and every village will have to begin organizing itself autonomously.

⁵⁷ In their speculative scenario, Sweden, in line with its 2017 targets, reached net-zero emissions of greenhouse gases already in 2045, being the first country in the world to step out of the fossil era, which globally lasted between 1849 and 2049.

⁵⁸ Since 2019, Carbon Ruins has taken several forms and travelled to various locations. At present, it exists as a mobile exhibition and audio guide, with educational material for secondary schools, as part of the Human Nature exhibit at the Ethnographic museum in Stockholm, as performance and in a Scottish version displayed during COP26.

pollution in the city, using a pre-designed methodology and toolkit for monitoring. The colouring of the carefully designed tool allows us to infer both the type (particulate matter, pollen, ash, etc.) and the extent of the pollution, opening space for dialogue and redefining our future practices.

Reimagining our relationship with invasive species—specifically the Japanese knotweed—is at the core of Kitti Gosztola and Bence György Pálincás's [*Wild Garden Utopia*](#) (2018–), a long-term speculative project unfolding through workshops, videos, installations, shared meals, and collective making. Set in a future emerging from ecological collapse, the project transforms Japanese knotweed from a species commonly perceived as alien and destructive into a pioneer species and vital companion for human survival, providing food, building materials, and tools while preparing the ground for future ecosystems (see Fig. 40). Through this speculative reversal, the artists challenge anthropocentric notions of invasiveness and usefulness, opening questions around green xenophobia, eco-patriotism, self-sufficiency, and possibilities for human–plant coexistence.

These various approaches demonstrate how artistic futuring operates through the creation of speculative situations in which alternative ecological and social relations can be collectively explored, experienced, and negotiated. The importance and value of these practices lies not in their capacity to offer ready-made solutions to climate change or ecological degradation, but in their ability to cultivate what might be described as *future literacy* (Kuzmanovic & Gaffney, 2019): the capacity to recognize the multiplicity of possible futures and relationalities, and to perceive oneself as an active participant in their formation. By making alternative worlds temporarily inhabitable, artistic futuring methodologies create spaces in which dominant assumptions can be questioned, new relations can be rehearsed, and collective capacities for adaptation, care, and transformation can emerge. In this sense, artistic speculation functions as a catalyst for reimagining and potentially reshaping the future ecologies that are already in the making.



Figure 38. *LUIT: Manual of Adaptation to the Planet*. 2020. Photo: Loic Nys



Figure 39. *Climaginaires: Carbon Ruins*. 2019. Lund University, Lund, Sweden. Photo: Håkan Røjder



Figure 40. Kitti Gosztola & Bence György Pálincás: *Wild Garden Utopia*. Buckminster Fuller-inspired geodesic dome structure and workshop. 2019. Morning Boat, Jersey. Photo: Sári Ember

4.2 Case study: Microbial Futures Lab

While discourse on ecology and international conservation agendas have traditionally focused on large-scale ecological systems, visible losses and transformations, an equally crucial dimension lies at the microbiological level, where unseen organisms and processes play a fundamental role in shaping our future (Redford, 2023).

Urban environments are not only composed of visible grey, green, and blue infrastructures⁵⁹ and the human and more-than-human communities that inhabit them, but also of invisible microbial ecosystems that build the ecological and biological conditions of urban life. As cities become increasingly disconnected from biodiverse natural environments, microbial diversity declines (Redford, 2023). Microbial deprivation extends across soils, air, water, vegetation, and built environments, compromising the microbiomes of all organisms that inhabit the city. The condition of the urban microbiome is thus deeply entangled with the broader ecological crisis. Ecological degradation and microbial loss reinforce one another, reducing the resilience of both urban ecosystems and the multispecies communities they sustain.

According to the hygiene and biodiversity hypotheses, the lack of microbial diversity in the environment is one of the reasons for the increasing prevalence of allergic diseases, various gastrointestinal syndromes, immune deficiency and cognitive dysfunction (Bendiks & Volkmar Kopp, 2013; von Hertzen et al., 2011: 1089). A series of interventions in Finnish urban daycares aimed to test how increasing children's everyday exposure to biodiverse natural materials affects their microbiome and immune system regulation. In the studies, conventional daycare yards covered with gravel and artificial surfaces were transformed by introducing biodiverse materials—a mix of forest floor vegetation, soil, and other natural materials—into children's play environments. The researchers found that even short-term contact with these enriched environments increased the diversity of children's skin and gut microbiota. As a result, changes were seen in the levels of specific proteins called interleukins that facilitate communication within our immune system, and there was an increase in the frequency of regulatory T-cells, which play a crucial role in preventing autoimmunity (Roslund et al, 2020, 2021). Therefore, these interventions demonstrated that contact with microbially rich natural materials can indeed diversify human skin microbiota (Grönroos et al. 2019) and greening cities can decrease the relative abundance of potentially pathogenic bacteria in soil, positively affecting skin microbiota and immune system functions (Roslund et al. 2020, 2021), making us more resilient towards diseases. Such findings highlight the profound interconnectedness between humans and other forms of life: we are

⁵⁹ Grey infrastructure includes buildings, roads, pavements, utilities, drainage systems, bridges, and engineered structures. Green infrastructure consists of forests, parks, street trees, grasslands, and gardens. Blue infrastructure refers to rivers, lakes, wetlands, streams, and ponds.

interdependent beings, *nested ecosystems* (McFall-Ngai, 2017), *holobionts*⁶⁰ co-evolving with the microbes that surround us, live on us, in us, massively outnumbering human cells in our bodies.

The implications of these discoveries extend far beyond natural sciences, prompting a broader epistemological shift across the social sciences and humanities. As microbiome science confirms that humans are not autonomous organisms but multispecies assemblages, long-standing assumptions about individuality, health, agency, and care become increasingly difficult to sustain. Rather than bounded entities separated from the world, bodies emerge as porous ecosystems, continuously shaped through exchanges with the microbial communities inhabiting soils, waters, air, plants, animals, buildings, and other humans. In this sense, microbes reveal the ecological nature of life itself: understanding any organism requires simultaneously “zooming in” to their hidden microbial worlds and “zooming out” to the ecological networks that sustain them (Yong, 2016, p. 7–8)—a continual movement between the microscopic and the planetary. Such insights are echoed in Donna Haraway’s (2016) concept of *sympoiesis*, which understands life as an ongoing process of “*making-with*,” where beings emerge through relations with countless human and more-than-human others.

Many indigenous and local knowledge systems have long understood this interconnectedness, perceiving health, kinship, and environmental care as relational practices extending across human and more-than-human worlds. Among the Wari’ people of western Brazil, for instance, understandings of biological and social life are embedded in generations of everyday practices, including food sharing, kinship, childcare, epidemic responses, healing, mobility, ritual, and hospitality (Conklin, 2026, p. 107). Wari’ understandings of bodies as porous, mutable, and constituted through relations with other people, species, and environments increasingly find echoes in contemporary microbiome science; yet such Indigenous understandings were historically interpreted by Western scholarship primarily through cultural, social, or symbolic frameworks rather than as legitimate forms of ecological knowledge (Conklin, 2026, pp. 104).

The *microbial turn* therefore unsettles social imaginaries, but also political ones built upon autonomy, sovereignty, and exclusion. Fishel (2017, p. 14-15) uses the microbial body as a political metaphor to challenge the idea of the state as a bounded and self-contained body that must protect itself from external threats. If the human body is itself a multispecies assemblage, sustained through continuous exchanges with microbes and other forms of life,

⁶⁰ The term *holobiont* was coined by Lynn Margulis, a prominent biologist, in 1991 to describe a host organism (like a human or plant) and all its associated symbiotic microorganisms (microbiome) acting as a single ecological unit. However, the concept was already introduced in 1943 by theoretical biologist Adolf Meyer-Abich, to describe living beings as fundamentally relational and embedded within broader ecological communities rather than existing as isolated individuals (Baedke et al, 2020). This *holistic biology* (*Ganzheitsbiologie*), closely connected to his idea of *Mitwelt* (“shared world”), emphasizes the interdependence of humans, microorganisms, animals, and environments, challenging anthropocentric understandings of life and nature. This anticipated the work of later posthumanist theories, such as ideas developed by Donna Haraway. She uses the term *holobiont* not to designate host and symbionts—because according to her, all the players are symbionts to each other in diverse kind of relationalities—, but rather to describe living beings not as autonomous, self-contained individuals, but as multispecies assemblages composed of interdependent organisms living together (Haraway, 2016, p. 26), making it both a biological and philosophical concept. This idea is closely connected to her broader concepts of *sympoiesis* (“making-with”) and *worlding*, which emphasize that beings and worlds are continuously co-produced through relationships.

then autonomy and separation can no longer be understood as the foundations of security and welfare. Instead, interdependence, multiplicity, and permeability become conditions of collective wellbeing, opening political imaginaries oriented not towards isolation and survival, but towards coexistence and shared thriving. Therefore, microbes “offer a powerful lens through which to reintroduce biology into the complex entanglements of nature–human and body–society relations amid the ruins of ecologies” (Tsing et al, 2017, cited in Millei, 2026, p. 77), demanding new *biosocial*⁶¹ *imaginaries* (Lee, 2013). Understanding ourselves “as a host of microbes allows us to trace how large-scale processes—such as biodiversity loss, climate heating, and industrial pollution—literally go under the skin, shaping biological and social life from the inside out” (Millei, 2026, p. 86).

Unraveling these complexities is at the heart of the activities of the [Microbial Childhood Collaboratory](#) (MCC, 2022–), an interdisciplinary research group⁶² initiated by professor of early childhood education Zsuzsa Millei (Tampere University, Finland). The Collaboratory brings together experts working in the fields of environmental ecology, international relations, sociology, anthropology, childhood studies, social work, early childhood education, as well as the arts, in order to explore the role of microbes, particularly in relation to childhood. Its activities combine scientific inquiry, artistic practice, and participatory methods to develop what it calls a *thinking microbially* approach—linking biological processes with social, cultural, political and ecological perspectives. By making microbes perceptible through sensory ecology, artistic practices, and experimental pedagogies, the project aims to rethink childhood and the biosocial/microbial child⁶³—the biosocial/microbial human in a broader sense—, re-envisioning the ethics and politics of childhood-related fields, and navigating a new model for intergenerational future-making that emphasizes that caring for human bodies is inseparable from caring for environmental ecosystems.

I became a member of the network in early 2022, when the Collaboratory initiated its first project of the same name. At first, my role was to design and perform artistic activities that facilitate research thinking and collaboration among members of the group, which resulted to

⁶¹ The concept of the *biosocial* refers to the dynamic and reciprocal entanglement of biological and social processes. Rather than treating biology and society as separate domains, a biosocial perspective understands bodies and life processes as emerging through the dynamic interplay between biological or ecological materialities and social forces. In this sense, the biosocial can be understood as the folding together of biological and social realities, where neither exists independently of the other. Closely aligned with new materialist scholarship, biosocial approaches emphasize that bodily processes and environmental systems are inseparable from relations of power, social hierarchies, and discursive practices. They therefore challenge dualistic distinctions between nature and culture, highlighting instead the co-constitutive relationships through which human and more-than-human life are shaped (Lee, 2013, p. 56–78; Lee & Motzkau, 2012, p. 496–500).

⁶² **Original Collaboratory members:** Zsuzsa Millei (Tampere University, Finland), Sarah Alminde (Roskilde University, Denmark), Asta Breinholt (Roskilde University, Denmark), Eva Bubla (Independent Artist-Activist, Hungary), Beth Conklin (Vanderbilt University, USA), Riikka Hohti (University of Helsinki and Tampere University, Finland), Stefanie Fishel (University of Sunshine Coast, Australia), Mira Grönroos (University of Helsinki, Finland), Sami Keto (Tampere University, Finland), Nick Lee (University of Warwick, UK), Parinaz Poursafa (Tampere University, Finland), Marja Roslund (Natural Resources Institute, Finland), Spyros Spyrou (European University, Cyprus), Tuure Tammi (University of Oulu, Finland), Hanne Warming (Roskilde University, Denmark), Päivi Outinen (Director of Tahmela Daycare, Tampere Municipality).

New Members: Erika Aalto (Independent Artist, Finland), Jan Varpanen (Tampere University, Finland), Jannelle Gallagher (Consultant and Education and Care Specialist at Community Early Learning Australia), Red Ruby Scarlet (Activist, early childhood teacher-researcher, consultant, artist and academic, Australia), Nadine Voelkner (University of Groningen, The Netherlands), Erla Olsen (The University of the Faroe Islands), Petur Lamhauge (The University of the Faroe Islands)

⁶³ See one of the publications as an outcome of the research: Millei, Z., Lee, N., Spyrou, S., Roslund, M., Breinholt, A., Tammi, T., Conklin, B., Alminde, S., Warming, H., & Hohti, R. (2025). Child Ecologies in a Microbial World: A New Imperative for Childhood Studies. *Journal of Childhood Studies*, 50(1), 34–52. <https://doi.org/10.18357/jcs501202521918>

be a highly inspiring artist-researcher position. The aim was not to instrumentalize art for the purpose of science communication, but to trigger imagination and unfold new kinds of knowledges of the microbial world and relations through artistic processes.

I designed various formats and methods of engagement: sensory and performative workshops to foster attentiveness to microbes, microbial walks to map the urban microbiome, and microbial objects to grow our collective microbiome. These activities were introduced either during the bimonthly online meetings or the yearly onsite meetings we had with the research team.

From the pool of possible activities, after the first year of the project, my attention was drawn towards developing a method and discursive artistic format, a “tool for thinking” that synthesizes the research findings of the various fields, the embodied experiences, scientific and indigenous knowledges related to microbes, and triggers visions of *microbial futures*: imaginaries of future ecologies and practices in which microbial life becomes central to how human and non-human bodies, urban environments, and biosocial relations are understood and organized. This led to the birth of [*Microbial Futures Lab*](#) (2023-), a participatory art project that takes the form of a traveling laboratory exploring possible future relationships between humans, microbes, and environmental bodies through the lens of healthcare practices (see Fig. 41–42). Grounded in scientific research on microbes, environmental and human health, the concept of nested ecosystems and interdependence, the project uses artistic speculation to imagine how these understandings might shape future forms of co-existence and everyday practices of care. Through a speculative and participatory world-building, future medicines are designed that rethink *health* not as an individual condition, but as the collective well-being of interconnected human and more-than-human lifeforms—*patients*—, proposing future scenarios in which symbiosis, ecological relations, and microbial co-existence become central to healthcare practices, ecological and societal resilience.

At its core, as sociologist and childhood studies scholar Nick Lee, one of the members of the Collaboratory articulated it, the project experiments with and investigates how artistic practices can facilitate forms of *biosocial imagination*: ways of thinking that understand microbial life not only through ecological or biological frameworks, but also through relational, social, and cultural dimensions, and the dynamic interplay of these forces. Where microbes are explored in their complexity, not only as pathogens but also as life-supporting agencies. But rather than approaching microbes solely as invisible biological agents, the project invites participants to perceive humans themselves as microbial and more-than-human beings, fundamentally entangled with wider ecological systems and multispecies relations. Within this framework, healthcare becomes the conceptual and performative channel through which these questions can be explored: future medicine functions not simply as a fictional device, but as a speculative tool for collectively imagining alternative understandings of care, interdependence, and symbiotic coexistence in the context of ecological crisis.



Figure 41. *Eva Bubla: Microbial Futures Lab*. 2023. 1111 Gallery, Budapest, Hungary. Photo: Nyíri Julianna / MKE



Figure 42. *Eva Bubla: Microbial Futures Lab*. 2023. 1111 Gallery, Budapest, Hungary. Photo: Nyíri Julianna / MKE

4.2.1 Microbial Futures and Imaginations: Designing a Future Medicine as an Art & Science Experiment

Microbial Futures Lab operates through multiple interconnected layers of activities and target audiences. The development of the first speculative medicine, or more precisely, its *patient information leaflet*—a document provided with medications or medical procedures that give clear, accessible information about usage, dosage, precautions, and potential side effects—, marked the initial phase of the project. Scientific research, interdisciplinary understandings of microbes, and artistic imagination on microbial futures began to converge through a collaborative process with researchers of the Microbial Childhood Collaboratory. Functioning simultaneously as a creative writing exercise, conceptual framework, and speculative artistic experiment, the process of producing this document explored how complex microbial and ecological knowledge and human-microbial relations could be translated into the familiar format of healthcare communication.

Choosing the patient information leaflet as a format (see Appendix B) was a conscious decision precisely because of its familiarity: it immediately evokes connotations of institutional healthcare, pharmaceutical culture, and the everyday rituals of taking medicines—making audiences intuitively relate to the framework regardless of their background. However, while the recognizable aesthetics, the structure and terminology of a patient information leaflet was retained, its content was deliberately ‘hacked’, combining factual, research-based microbial knowledge with artistic speculation about holistic, or symbiotic future healthcare practices that benefits both humans and more-than-humans. This also entailed the reconfiguration of the position of the *patient*: rather than assuming that healthcare exists solely to maximize human well-being, while other forms of life remain resources, the project sought to move away from such anthropocentric frameworks. The patient was no longer understood exclusively as a human body requiring treatment, but any bodies in the ecological network. The speculative medicines therefore aimed not merely to restore human health, but to imagine forms of intervention that contribute to the flourishing of entire multispecies networks. In doing so, the project shifts the role of humans from that of passive beneficiaries or exploiters of nature toward active participants in reciprocal relationships. By adopting the aesthetics and language of medicine while transforming its underlying logic, the project created a tangible entry point into shaping these imaginations. The patient information leaflet thus became both an artistic artifact and a methodological tool for knowledge production and speculative fabulation.

For the development of this first speculative future medicine, the writing process itself took place online. I prepared a blank patient information leaflet with the headings for various sections that needed to be filled with the relevant information, then organized zoom meetings with the research team members⁶⁴ to be able to discuss our starting points, main ideas, and to work real-time on the content in the same shared online document, which anyone could return to later individually.

⁶⁴ co-authors of the SymbiFarm patient information leaflet: Sarah Alminde, Asta Breinholt, Eva Bubla, Stefanie Fishel, Riikka Hohti, Nicholas Lee, Zsuzsa Millei, Marja Roslund, Spyros Spyrou, Tuure Tammi, Hanne Warming

What is this medicine or treatment for? What do you need to know before taking the medicine or starting the treatment? How to take it or apply it? How does it affect children, pregnancy and breastfeeding, driving or other activities? What are the recommended doses? What kind of side effects can you expect?

These were the main questions that directed our thinking. I was in a double position: as a co-author, I was developing the text along with others, but at same time, I also aimed to facilitate other authors in this speculative pharmaceutical context to articulate ideas, where there is also space for humor, the undiscovered and the unknown.⁶⁵ As one of the participants, anthropologist Beth Conklin later recalled, this pharmaceutical framing generated a simultaneously playful and provocative atmosphere that opened space for collective imagination and discussion.

Over the course of a couple of weeks, we developed the concept and the patient information leaflet of our first speculative medicine called *SymbiFarm* (see Fig. 43). Building on microbial science proving that contact with microbially rich natural materials can diversify human skin microbiota (Grönroos et al. 2019) and positively affect immune system functions (Roslund et al. 2020, 2021), as well as on studies that connect a healthy microbiome with improved mental health (Bendiks & Volkmar Kopp, 2013), in our imagined future, *SymbiFarm* is used for the treatment of microbial dysbiosis and lack of immunological resilience. Relational ontologies informed further benefits of the treatment: by taking the medicine and becoming more aware of the symbiotic relation with microbial lifeforms, *SymbiFarm* brings a feeling of community and enchantment with the natural world, increasing the sensation of peace and reducing the feelings of hopelessness, despair and a tragic focus on dystopian hellscapes that might populate our future as homo sapiens.

SymbiFarm was envisioned for future patients who have poor contact with the natural environment, or high exposure to disinfection, as the previously discussed studies show that they are at the highest risk of developing illnesses. If there is regular access to green environments, the sea, freshwaters, forest hikes and soil-based activities, there is no need to take the medicine, given the proper access to diverse microbial colonies. In all other cases, *SymbiFarm* is the recommended treatment.

When determining the dosages, we considered how factors such as age, the type of living environment, and the level of environmental degradation influence the microbiome. As there is a critical “window of opportunity early in life” (Al Nabhani & Eberl, 2020) during which microbial exposure is necessary for the development of a balanced immune system, the recommended dose for children under 5 years is 3x1, under 14 years is 2x1, and 1x1 for

⁶⁵ There was one ecologist in our research group, who decided not to participate in the activity due to patent concerns. She was a member of the research group that developed a so-called *biodiversity powder* and patent, which was also one source of inspiration, and she expressed her worries about a “conflict of interest” as a scientist. She also feared that her imagination would be very much limited by ideas of the possible and impossible; which would be challenged too much in the exercise. While I explained that the artistic activity is not aiming to create a real product for the market but is a creative practice to help unfold our knowledge around microbes, I also respected her concerns and decision. It was a very intriguing situation to learn about the different dynamisms that shape scientific and artistic approaches, and I also valued honest and clear communication. I would also note that the other ecologist member joined the creative process, later referencing the speculative patient information leaflet as a group publication. Both of them contributed to the development of new medicine ideas at later workshops, and have been adding a great deal of expertise to the Lab as members of MCC.

adults, emphasizing the need of proper microbial exposure in the early ages. Since larger settlements are presumed to be more exposed to microbial deprivation, the duration of the treatment was determined based on the size of the settlement and the extent of urbanization: one week in a village, two weeks in a town, three weeks in a city, and a month in a metropolis.

As all medicines have some, SymbiFarm was also endowed with a number of side effects. Luckily, they are almost all positive. The patient information leaflet recalls “registered” cases of a feeling of vitality and strong devotion to nature (referring to the beneficial effect of natural materials on the microbiome), the microbial world opening up to human sense-making (portraying an altered consciousness about non-human lifeforms), the improvement of planetary health (the strengthening of symbiotic relationships as a result of that altered consciousness), and also some rare examples of spontaneous hugging or biosocial birthday parties (sharing in more biological ways to further diversify the microbiome), just to mention a few.

In the end, SymbiFarm—as an artefact—materialized itself in the form of a *pill*⁶⁶, an “encapsulated forest ecosystem,” containing biodiverse forest floor materials such as moss, lichen, and soil (see Fig. 44). Pill carries a multilayer of meanings here, and consciously ambiguous, critical connotations, that were also noted in the interviews I undertook with the co-authors of the patient information leaflet. As Sami Keto recalled, by taking a SymbiFarm pill, one experiences a ritual, relating to the rituals in medical treatments: “I took something from outside my body, produced by other bodies of lichen and moss, which then entered my body, becoming part of me while changing during the process through numerous and diverse relations.” On the other hand, whereas microbial interactions and effects in the body are super-complex, the SymbiFarm product reduced these to a simple pill, “a quick-fix type of product perfectly suiting capitalist/commercial profiteering,” as Beth Conklin articulated it. In this regard, the pill critically echoes Mark Fisher’s notion of capitalist realism by exposing how even ecological repair and healing become reformulated through the logics of commodification. Rather than imagining systemic transformation, the pill presents a deliberately ambiguous solution in which the environmental crisis is absorbed back into consumer culture, revealing the difficulty of conceiving responses to ecological collapse outside capitalist structures themselves. The material form in itself is provoking, disturbing, enhancing imagination but also raising ethical questions, and as such, testing boundaries and notions of “good” and “bad” human practices and responsibilities. As Riikka Hohti put it, the narrative is somehow screaming that this should not be the case, and is demanding the existence of other kinds of future; which formulates one of the main messages of the artefact. The tension between the benefits and the commodified form provokes resistance, contemplation, “requiring us to make quite a few adjustments along the way to our desired—non-commodified, non-commercialised, anticapitalist—future,” said anthropologist and sociologist Spyros Spyrou.

⁶⁶ I was responsible for translating the concepts and narratives of the patient information leaflet into a materialized artistic form, an art object. In order to preserve the original language and structure of the patient information leaflet—and thus the speculative pharmaceutical context—while also appropriately crediting the co-authors, I identified myself as the *manufacturer*, while all the authors were listed as *research license holders*.

SymbiFarm was followed by the development of a series of additional speculative remedies, together with their material embodiments and accompanying patient information leaflets as artefacts,⁶⁷ expanding both the collection and the narrative universe of the Lab. These medicines continued to draw on scientific research while exploring how future healthcare practices might be reimagined through microbial perspectives. Building on studies demonstrating the health benefits of contact with biodiverse natural materials, while also critically reflecting on the widespread use of sanitizers and disinfection practices that eliminate not only pathogens but beneficial microbes as well (Dimpfl, 2018, p. 207; Haahtela, 2019, p. 1448–1450), speculative alternatives to conventional hygiene products were developed. *Soil Bars*, soap-like treatments whose active ingredients consist of microbially rich natural materials such as soil and clay, rather than sterilizing the skin, restore microbial diversity and support the treatment and prevention of immune-mediated disorders (see Fig. 45). These remedies reframe familiar healthcare routines by asking seemingly simple questions: what if handwashing became a practice of microbial enrichment rather than microbial elimination?⁶⁸ Or, what if beneficial microbes could be administered not only through ingestion or skin contact, but through breathing? Such questions informed the development of the household edition of *Designated Breathing Zone*, a device inspired by research showing that humans are constantly surrounded by a unique *microbial aura*⁶⁹ (Meadow et al., 2015) composed of microorganisms circulating through air and originating largely from soils, plants, and other environmental sources.⁷⁰ Designed for use in heavily polluted environments, the device cultivates beneficial microbial communities and filters air through living plants, allowing patients to diversify their microbial exposure through everyday respiratory practices (see Fig. 46). In both cases, scientific knowledge, relational ontologies and speculative imagination run in parallel, transforming established healthcare rituals into opportunities for rethinking future relationships between humans, microbes, and the environments they inhabit.

⁶⁷ This time, without the participation of the research team.

⁶⁸ Not instead of using water and necessary sanitation, but instead of the excessive use of hand sanitizers.

⁶⁹ Researchers placed individuals in a controlled chamber and showed that humans continuously emit a detectable cloud of microbes into the surrounding air, creating a distinct airborne microbial signature, often called the aura-biome.

⁷⁰ At the same time, every household has a distinctive microbiome that largely comes from the people who live in it. “Their hand bacteria coat the light switches and doorknobs. Their foot microbes cover the floors. Their skin bugs get on the kitchen surfaces. And all of this happens with astonishing speed. Within 24 hours of moving into a new place we overwrite it with our own microbes, turning it into a reflection of ourselves” (Yong, 2016, p. 252).

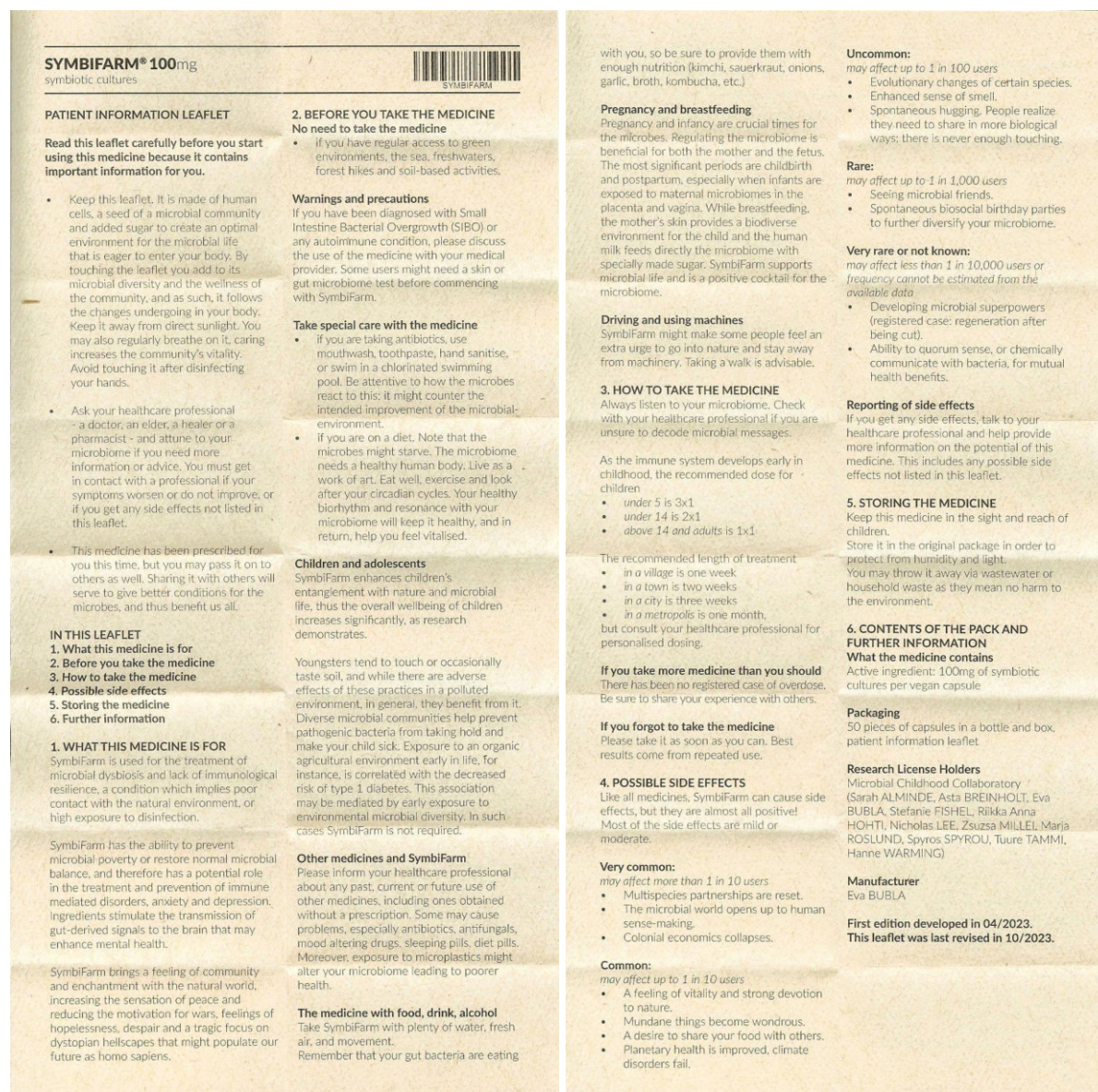


Figure 43. Eva Bubla: *Microbial Futures Lab. SymbiFarm patient information leaflet*. 2023. 1111 Gallery, Budapest, Hungary. Photo: Nyíri Julianna / MKE



Figure 44. *Eva Bubla: Microbial Futures Lab. SymbiFarm. 2023. 1111 Gallery, Budapest, Hungary. Photo: Nyíri Julianna / MKE*



Figure 45. *Eva Bubla: Microbial Futures Lab. Soil bar. 2024. BENU Pharmacy / Placcc 2024, Budapest, Hungary. Photo: Attila Balogh*



Figure 46. *Eva Bubla: Microbial Futures Lab. SymbiFarm and Designated Breathing Zone household edition.* 2024. BENU Pharmacy / Placce 2024, Budapest, Hungary. Photo: Attila Balogh

4.2.2. The Future Medicine Workshop as a Method

I became increasingly interested in how these speculative processes could be translated into a more compact and accessible participatory workshop format capable of engaging broader and more diverse audiences. This raised a series of methodological questions concerning the relationship between artistic facilitation, scientific knowledge-sharing, and collective imagination: what kinds of frameworks are needed to support research-based but speculative thinking about human-microbial relations, microbial futures, and what methods can simultaneously enable effective knowledge transfer while also generating new imaginaries, perspectives, and forms of relational thinking? The development of the *Future Medicine Workshop* emerged from this inquiry as an attempt to create a participatory artistic methodology through which scientific research and speculative world-building could intersect within a shared process of collective future-making.

The *Future Medicine workshop*, combining elements of visual, bio, multisensory and performing arts,⁷¹ creates a speculative and performative space for the collective exploration of human-microbial relations and ecosystems (see Fig. 47–52). The workshop is introduced through a performative “product demo”⁷² in which, wearing a white lab coat and assuming the identity of the founder of Microbial Futures Lab, I present the existing collection of this fictional pharmaceutical entity: speculative medicines developed in previous iterations of the project, which introduce key ideas and research findings through the microbial and ecological narratives connected to them, but also microbial imaginations regarding the future. The lab coat as a costume and the medicines as props function as performative and relational devices through which a shared speculative atmosphere can emerge—one which the participants of the workshop can collectively inhabit. They are also given fictional identities: foreshadowing the holistic, symbiotic nature of future healthcare practices, they are invited to become *planetary healthcare advisors* who identify further patients, diagnose conditions, and collaboratively design speculative treatments.

As a first step, this task entails the critical examination of the present.⁷³ Groups of participants—planetary healthcare advisors—collectively reflect on existing crises and challenges, drawing both on the previously performed scientific research concerning microbial diversity, urban ecosystems, and human-microbial relations, as well as on their own situated experiences, observations, and concerns. Building on this shared critique of the present, they are then invited to collectively imagine a different future, situated in the year 2050—a symbolic temporal horizon that recurs frequently within climate discourse due to its association with climate targets, sustainability agendas, and near-future projections that remain imaginable within lived experience. Importantly, the aim of this speculative phase is not predictive realism or technological forecasting, but the liberation of imagination itself. By temporarily suspending the demand for feasibility, participants are encouraged to explore

⁷¹ Microbial Futures Lab can be understood as a transdisciplinary participatory art and artistic research project that combines speculative methodologies, microbial thinking, and socially engaged practices to collectively imagine alternative future ecologies and practices of care.

⁷² which can be understood as a lecture performance

⁷³ the present, which takes the role of the past in the performance

unexpected perspectives, ecological interdependencies, and alternative forms of co-existence that may otherwise remain difficult to articulate within dominant frameworks of the present.

This format, based on the feedback of workshop participants, “opens new perspectives and encourages a deeper analysis of scientific ideas and discoveries” says environmental ecologist Marja Roslund, or “even raises questions that science might be too embarrassed, too shy, or too uncreative to ask,” adds anthropologist Spyros Spyrou. Sociologist Asta Breinholt compared it to a “sandbox, where participants can draw on their theoretical insight from their respective fields, and combine that with the understandings about humans, microbes and the holobiont.”

During the initial workshop for members of the Microbial Childhood Collaboratory (MCC Lab, 2023), a pool of speculative medicines, practices, and future imaginations were born targeting the treatment of microbial dysbiosis experienced in cities and communities.

Exploring possible connections between sound, microbial life, and gut health, a multisensory therapy called *Microvibes*⁷⁴ was designed. The speculative treatment proposes that certain types of music could promote beneficial bacteria while decreasing the presence of pathogenic bacteria in the gut—an idea that finds parallels in later-identified research on music-based interventions and gut microbiota (Niu et al., 2023).⁷⁵ In the imagined therapeutic environment, the patient is served a high-microbial-diversity cocktail on a moss sofa, itself rich in beneficial environmental microbes, with the aim of diversifying their biosocial connections.

Reflecting the emerging probiotic turn⁷⁶ from antimicrobial approaches centred on eliminating microbial threats towards practices concerned with restoring microbial diversity and ecological relations (Lorimer, 2017, 2019), participants proposed the creation of *Microbial Archives*,⁷⁷ enabling patients of all species to have their microbiomes restored without antibiotics, using their own healthy microbiota previously stored in the archive.

The change of institutional settings was also targeted in the need to reconceptualize future healthcare practices: a network of clinics, community health centers, but even educational institutions and residential areas need to legitimize *microbial care* and *microbial building codes*⁷⁸ as the basis of future treatments. Medical prescriptions in this proposed future include microbial procedures such as forest and soil bathing in the consciously designed

⁷⁴ planetary healthcare advisors: Stefanie Fishel, Marja Roslund, Tuure Tami

⁷⁵ A 2023 study examining the effects of music on the gut microbiome of mice found that exposure to music during feeding altered the composition of gut microbial communities and influenced physiological processes such as body weight gain. The research suggests that sensory and affective environments—including sound—may shape microbial ecosystems alongside more commonly studied factors such as diet or pollution. Although conducted on mice, the study contributes to emerging discussions on the interconnectedness of environment, emotion, and microbial health, opening speculative possibilities for future therapeutic practices involving sound and sensory experience (Niu et al, 2023).

⁷⁶ The term “probiotic turn” describes a broader cultural, scientific, and medical shift from viewing microbes primarily as dangerous pathogens to understanding them as beneficial, symbiotic organisms essential to health and ecological balance. It is closely connected to microbiome research, preventive healthcare, and increasing criticism of excessive antibiotic use and sterilization practices.

⁷⁷ planetary healthcare advisors: Asta Breinholt, Riikka Hohti, Sami Keto

⁷⁸ planetary healthcare advisors: Sarah Alminde, Beth Conklin, Spyros Spyrou, Hanne Warming

environmental facilities of these institutions, integrating social interactions as a social medicine, knowing that healing is not an individual process but a collective, relational experience. In 2050, such practices are imagined to be formally recognized and supported, covered by health insurance and regulated by health inspections, pointing toward a future in which microbial well-being is embedded within both healthcare systems and everyday environments.

However, a symbiotic relationship between human and microbial, more-than-human lifeforms implies the necessity of fostering conditions that support the well-being of all interconnected symbionts within the ecological network. Along this logic, Lake Balaton was identified as a primary patient,⁷⁹ who suffers from accumulated agricultural waste. The excessive use of fertilizers in agriculture loads the farmlands by an increased level of phosphorus and nitrogen, which are then leaking into our freshwaters, contributing to the risk of algal blooms (Smith et al., 1999, p.180–182; Istvánovics et al, 2022). While normally it is the human who takes a pill as medication, this speculative, preventive freshwater treatment, the *human pill*,⁸⁰ uses the human body itself as a pill for water bodies. A specific gel is applied on the skin of the swimmer, similar to the use of a sunscreen, which gel then absorbs the excess nutrients from the lake during water activities, preventing algal bloom. The gel changes its color when it is full, and its peel can be then left in the designated areas at the beaches—which also already exist in 2050—, and can be reused in agriculture as fertilizer, contributing to economic circularity.

In later phases of the workshop development, in which I began involving broader and more diverse audiences, I encouraged participants to identify more-than-human bodies, ecosystems, and environments as their subjects more explicitly. Retaining the workshop's original structure and logic, participants were invited to diagnose ecological and multispecies conditions and to propose future treatments and practices, thereby rethinking care, illness, and healing through relational and more-than-human perspectives embedded in the microbial context.

4.2.3 Opening to the Public: Building a Network of Planetary Healthcare Advisors

Another layer of *Microbial Futures Lab* focuses on engaging wider audiences in the collective creation of microbial imaginaries and future visions. The participants of these workshops are not necessarily scientific experts in the conventional sense, but citizens whose situated experiences regarding the local ecosystem and its challenges become essential forms of expertise within the speculative process. Through the fictional framework of becoming planetary healthcare advisors, participants are invited to temporarily inhabit an expert role in which they can expand their own sense of agency, responsibility, and relational awareness. In this context, after familiarizing participants with the microbial knowledges and imaginaries

⁷⁹ But the diagnosis is a valid risk in case of other freshwaters as well.

⁸⁰ planetary healthcare advisors: Zsuzsa Millei, Nick Lee, Mira Grönroos

represented in the original remedies of the Lab (“product demo”), their local observations, environmental concerns, and everyday experiences are brought into the shared imaginative space, where they collectively identify—*diagnose*—ecological problems and speculate on possible responses and futures—*treatments*, in the context of microbial processes.

Although the workshop openly operates through play and fiction, this speculative “as if” structure is precisely what allows participants to experience themselves as capable of intervention and change, cultivating a sense of agency in relation to possible futures (Kuzmanovic & Gaffney, 2017, pp. 107–108; Time’s Up, 2022). By rehearsing alternative ways of thinking, diagnosing, and caring within the protected space of the game, participants may begin to perceive their own capacity to unravel microbial complexities and influence ecological and social realities differently, making imagination itself a first step toward transformative engagement with existing systems, practices, and possible futures. The future-oriented dimension of the project lies not primarily in anticipating which medicines or technological innovations might eventually be realized, but in the imaginative process of designing them. It is through this process that new imaginaries become possible, perceptions and relationships are reconfigured, and existing ways of relating to human and more-than-human worlds are reconsidered. The significance of the speculative exercise therefore resides less in the proposed interventions themselves than in how it reshapes modes of perception, connection, and understanding, thereby contributing to the formation of alternative visions of the future.

Microbial Futures Lab, as a public art project, has traveled to various locations with its pop-up pharmacy to engage the general public—biologists, architects, engineers, horticulturalists, social workers, researchers, artists, activists, teachers, students, grandmothers, and so forth (see Fig. 53–59).⁸¹ In some cases, the “product demo” was followed by a diagnostic walk with the purpose of identifying potential patients in the city.

Certain imaginaries targeted the rehabilitation of the urban microbiome and proper nature contact, turning contaminated soil and freshwaters, microbially poor surfaces, or overburdened urban ecosystems to patients. Drawing on the experiences of one of the workshop participants who is working in a rehabilitation project at the forest called Bosco della Goccia,⁸² *Phytostabilization Kits*⁸³ were designed to remove the toxins (heavy metals and micropollutants) from post-industrial soil and regenerate soil life with the help of the plants *Robinia pseudoacacia*, *Populus* spp, *Salix* spp., and fungi *Pleurotus ostreatus*. Taking advantage of the water-purifying property of activated carbon (Patmont et al. 2020), large-scale *carbon sponge islands*⁸⁴ floating on the canals in Darsena, Milan, were envisioned

⁸¹ **2026:** MKE/Lehetőségek tere, Budapest, Hungary; **2025:** Hope and Resilience Conference, University of Jyväskylä, Finland; **2024:** KAIR, Šopa Gallery, Kosice, Slovakia; FAROUT Festival, BASE Milano, Italy; METU Budapest, Hungary; PLACCC Festival, Budapest, Hungary; HAPUfest, Pristina, Kosovo; Childhood and Communities - The X Conference on Childhood Studies, Helsinki, Finland; Tampere University, Finland; In SITU Open Day, Provinciaal Domein Dommelhof, Pelt, Belgium; **2023:** Microbial Childhood Collaboratory Onsite meeting #2, Hvalsø, Denmark; 1111 Gallery, Budapest, Hungary

⁸² More information: <https://eui-goccia.eu/en/progetto>

⁸³ planetary healthcare advisors: Gianluca Rapaccini, Linda di Pietro, Chiara Cerruti

⁸⁴ planetary healthcare advisors: Marta Colombi, Lorenzo Fassi, Laura Pellini

with the purpose of regulating water health and microbial balance. Another proposition to treat polluted water as well as citizens with microbial dysbiosis uses the mechanism of phytodepuration—a natural, sustainable wastewater treatment method that employs plants (macrophytes), soil, and microorganisms to filter and purify water, mimicking natural wetlands (Riva, 2020). *Phytodepurated natural pools*⁸⁵, using water from underground canals, were conceptualized to regain microbial balance and connections among various bodies.

At the same time, a huge amount of soil is locked underground and in between concrete, with little or no ability to absorb water or nurture biological life. As a remedy, *subterranean modules*⁸⁶ made of roots, mosses, lichen and ferns growing upside down in the ceiling of metro stations were envisioned. Further propositions to treat the concrete-covered “skin” of urban areas included *multispecies healthcare products*⁸⁷ that cool and hydrate these surfaces, *spore sprays* that grow nurturing microbial masks,⁸⁸ and peeling treatments with composting remedies called *Stercus Sine Concreto*⁸⁹ that break up the concrete and feed the underground communities of trees and mycelium.

In Prishtina, due to the problem of heavy air pollution—which is a result of (illegal) use of coal in the area, especially in the winter for heating purposes—the urban atmosphere was identified as a patient. Vacuum rooms⁹⁰ were envisioned to filter harmful pollutants and to regain an optimal environment for air microbes and urban citizens. At the same time, a Hungarian speculative remedy for the treatment of microbial dysbiosis in the indoor atmosphere proposed a mobile air filter in the shape of a *floating microbial cloud*⁹¹ for household use.

Other treatments targeted to repair damaged, overburdened urban ecosystems lacking biodiversity on the micro and macro scale by limiting human presence. Parts of Milan are the victim of heavy construction work without any consideration of the local flora. A speculative future treatment, gigantic glass domes called *Islands of Sleep*⁹² were designed to offer remedies for the streets of Milan by inviting people to stop and take a break from activities there. As a microclimate, these domes incubate various plants, microorganisms, and smells that make people stay or even fall asleep while natural spaces in the city can be rehabilitated. As not everyone is able to visit these spaces, the fragrances as bottled perfumes were imagined to be applied outside Milan as well. Fragrance STAI helps people slow down and stay in one place for rest, while DORMI enables sleeping until the natural environment can regenerate.

⁸⁵ planetary healthcare advisors: Erika Ravet, Zoe Romano, Serena Vernazza

⁸⁶ planetary healthcare advisors: Rosa Lanzaro, Marta Lucchini, Elena Redaelli

⁸⁷ planetary healthcare advisors: Dóra Györfi, Zsófi Illés, Niki Lakatos

⁸⁸ planetary healthcare advisors: Dorka Biro, Kata Cserne, Tekla Gedeon, Ági Györfi

⁸⁹ planetary healthcare advisors: Dániel Biljarszki, Gabriella Kiss, Emese Králik, Eszter Lázár
Stercus Sine Concreto is a pseudo-Latin term meaning “Manure without concrete.”

⁹⁰ planetary healthcare advisor: Florent Mehmeti

⁹¹ planetary healthcare advisors: Adrienn Henger, Imola Kreisz Imola, Nóra Nemes

⁹² planetary healthcare advisors: Andrea Cristallini, Elisa Ferrari, Lucia di Pietro

Further imaginaries targeted multi-patient treatments more explicitly. Milkweed is the only plant on which the endangered species of monarch butterflies⁹³ lay eggs, and the only source of food for baby caterpillars. However, due to the use of pesticides and the fragmentation of natural habitats, the monarch butterflies are fastly approaching extinction. Conservationists have already pointed out that planting the right species of milkweed in a given area can help them and other pollinators thrive (World Wildlife Fund, n.d.). During the workshops, the use of *natural fibre nets*⁹⁴ were imagined, which are soaked in microbial plant food at given times to feed the milkweed in times of rain, and strengthen the natural habitat of monarch butterflies.

*Pollen inhalers*⁹⁵ are also aiming to offer remedies for multiple health issues and patients; for instance for the cedar tree plantation of Yufu and children in the area suffering from high exposure to its pollen. Monocultures are responsible for microbial deprivation, contributing to allergies and immune-mediated diseases. One preventive speculative treatment is the extraction of the pollen from some cedar trees of the plantation, and using it to fill the pollen inhaler, which should be used daily over six months to build immunity for the child. At the same time, further indigenous species are planted in the area, contributing to biodiversity and the creation of polyculture.

Several further patients, diagnosis, and treatments could be listed that appeared during the workshops; but it is already visible how diverse the types of patients and diagnosis, but also the nature of treatments and imagined futures are. The prior microbial knowledge inevitably shapes these imagined remedies and future imaginaries participants develop. In some cases, this is an area they discover through the workshop, but at the same time, public workshops occasionally attract participants with specific expertise in ecology, healthcare, or microbiology, creating a dynamic and heterogeneous knowledge environment. For this reason, my own role within the workshops remains intentionally flexible: while there is always an element of knowledge-sharing and scientific contextualization at the beginning, I continuously listen to and engage with participants' perspectives throughout the process of designing treatments to assist them with microbial references in the expansion of collective imagination and relational thinking.

This raises ethical questions as well. When a new medicine or treatment is born, who does it belong to? Is it ethical to use the ideas in the project? Is it ethical to materialize them as an art object? Otherwise, how to reference its authors?

These are questions not alien to any participatory art project, and ones that concern me from the very beginning, therefore, I am consciously addressing them in the process of the development of the project. From the point of view of a participatory artistic practitioner, I regard participants as authors of their own inventions and have been aiming to build a fair system where everyone is given credit. While the authorship of the overall project and

⁹³ Monarchs are threatened by pesticides, climate change, vehicle collisions, and fragmented and poisoned habitats as they navigate their way across North America (World Wildlife Fund, n.d).

⁹⁴ planetary healthcare advisors: Grisilda Kalci, Daniela Micheletti

⁹⁵ planetary healthcare advisors: Maisie Bishop, Olivia Clermont, Tom Kerbell, Maggie Smith, Riichiro Yamamoto

methodology belongs to the artist, with me creating the conceptual framework, the context itself and ways to trigger the ideas, each medicine and treatment runs under the name of its authors. It is clearly marked in the relevant patient information leaflet, doctor's prescription, and in case it is taking the shape of an art object, the development of the object is also based on mutual discussion, even if it is only me producing it. As mentioned earlier, in these cases, keeping the original terminology and speculative space of patient information leaflets and medicinal packaging, the name of the authors are indicated under the section "research license holders" and me under section "producer," keeping the medical atmosphere and playfulness. Authors are also referenced in the performative presentation of the Lab as colleagues or fellow planetary healthcare advisors.

To be able to have contact and keep track of collaborators of such kind, after a few workshop sessions, I also designed membership cards for planetary healthcare advisors. Therefore, on the one hand, I can easily reach participants when it is needed, while on the other hand, it also gives something tangible, an embodied memory of the workshop and our activities to them.

It is worth discussing shortly also the interactions outside the workshop setting, audience reactions that happen in the installation space of the Lab, the pop-up pharmacy. To date, it has been exhibited in various contexts: it has appeared in white cubes and public spaces alike, in a forest, a shopping mall and an actual, functioning pharmacy. While it was rather difficult to actively engage audiences in the pharmacy itself—naturally, as people who visit these places are mostly in pain and a hurry to reach a safe space of recovery—, it did give a meaningful context and possibility for conversation with healthcare workers and also to observe how a pharmacy functions, how pharmacists-patients interact. However, as the installation was placed in the shopwindow of the pharmacy, the general public who was passing by also had access to it from the street, some expressing their delight that there is something novel, something different, something thought-provoking there, which did trigger a number of interesting conversations, and opportunities to discuss the main idea of the project and the microbial research behind. Still, in terms of public engagement, having an empty space in a shopping mall converted into a pop-up pharmacy resulted to be more effective. Several people came inside after seeing the sign "barnatore" (pharmacy in Albanian), and even though the unusual medicines of the Lab were on display, there were patients who were insisting on discussing their own medical problems and expecting medical advice. For ethical reasons, I did emphasize these times the fact that I am an artist and we are in the middle of a speculative space, but this did not stop me from performing a consultation, referring to research knowledge or traditional practices, and human-microbial relations; and recommending visiting a certified doctor as well for a second opinion.

At the core of all above discussed artistic activities and the Future Medicine workshop methodology itself lies the message and recognition that "the future is microbial": that planetary health and future resilience fundamentally depend on restoring and sustaining biodiversity, including at the microbial level. Through exhibition visits and workshop participation, participants are invited to imagine how such multispecies futures and forms of ecological coexistence might become possible. Yet the significance of these workshops lies not only in the imaginative space they create, but also in their potential to reshape how

participants perceive existing ecological systems and infrastructures. The method has proven to be not only a means of disseminating microbial knowledge, but also an effective tool for collectively diagnosing the conditions of planetary bodies and the human practices that affect them. By identifying more-than-human patients and proposing speculative treatments, participants indirectly expose the shortcomings of current approaches to urban planning, water and soil management, agriculture, public health, and environmental care, while simultaneously rehearsing alternative futures grounded in multispecies ethics and in a holistic understanding of health and care. In this sense, the workshop transforms participants into temporary planetary healthcare advisors for damaged ecosystems, fostering forms of ecological responsibility and relational thinking that may extend beyond the speculative framework itself. Ultimately, however, for these imaginaries to move beyond the fictional and become materially transformative on a systematic level, broader forms of collaboration and the involvement of relevant stakeholders, institutions, and decision-makers are necessary.



Figure 47. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop. 2024. KAIR Residency, Kosice, Slovakia. Photo: Peter Michal*



Figure 48. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop. 2024. KAIR Residency, Kosice, Slovakia. Photo: Peter Michal*



Figure 49. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop. 2026. Lehetőségek tere / MKE, Budapest, Hungary. Photo: Viktor Kádár*



Figure 50. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop. 2026. Lehetőségek tere / MKE, Budapest, Hungary. Photo: Viktor Kádár*



Figure 51. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop. 2024. IN SITU Open Day 2024, Pelt, Belgium. Photo: Pedro Morato Gabao & Bryan Lassudry*



Figure 52. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop. 2024. IN SITU Open Day 2024, Pelt, Belgium. Photo: Pedro Morato Gabao & Bryan Lassudry*



Figure 53. *Eva Bubla: Microbial Futures Lab. 2024.* BENU Pharmacy / Placcc 2024, Budapest, Hungary. Photo: Attila Balogh



Figure 54. *Eva Bubla: Microbial Futures Lab. 2024.* HAPUfest 2024, Pristina, Kosovo. Photo: Arben Llapashtica / Teatri ODA



Figure 55. *Eva Bubla: Microbial Futures Lab. 2024. IN SITU Open Day 2024, Pelt, Belgium. Photo: Pedro Morato Gabao & Bryan Lassudry*



Figure 56. *Eva Bubla: Microbial Futures Lab. 2024. IN SITU Open Day 2024, Pelt, Belgium. Photo: Pedro Morato Gabao & Bryan Lassudry*



Figure 57. *Eva Bubla: Microbial Futures Lab.* 2024. Šopa Gallery, Kosice, Slovakia. Photo: Peter Michal

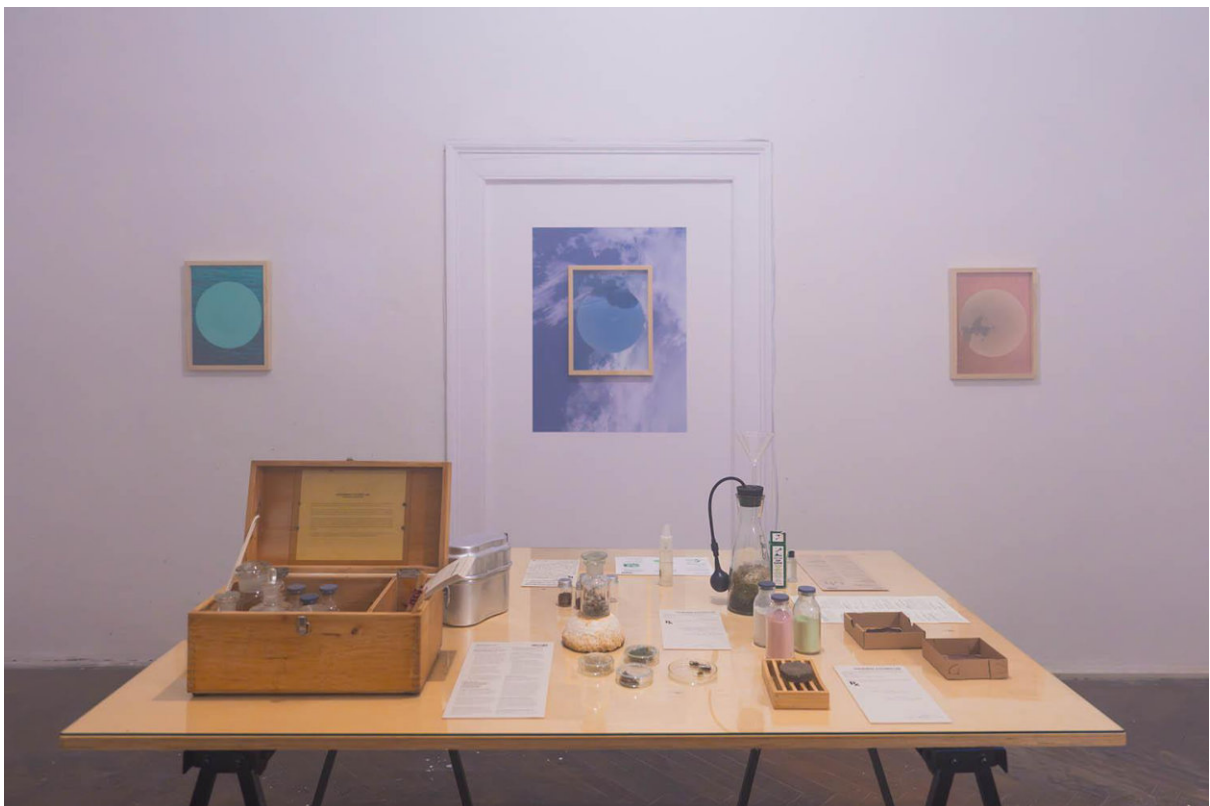


Figure 58. *Eva Bubla: Microbial Futures Lab.* 2024. Šopa Gallery, Kosice, Slovakia. Photo: Peter Michal



Figure 59. Eva Bubla: Microbial Futures Lab. Planetary Healthcare Advisors. 2025. Photo: Lilli Lumera

4.2.4 Future Implications: From Speculation to Implementation

Microbial Futures Lab is conceived as an inherently open-ended project, resisting any notion of completion or fixed form. It remains in a state of continuous development, where new elements, contributions, and artworks can always be added. This evolving structure allows it to adapt to changing contexts, incorporate diverse perspectives, and remain responsive to ongoing ecological and social questions, positioning the work as a living process rather than a final outcome.

A potential next phase of the project, and thus a further layer of the Future Medicine workshop methodology, lies in extending its scope toward the active engagement of policymakers, urban planners, public health professionals, and other institutional actors. By combining ongoing microbial and environmental research with locally situated experiences identified through the Future Medicine methodology, the workshops could create spaces in which decision-makers are invited to encounter these issues not solely through reports or statistics, but through embodied, narrative, and speculative forms of engagement. The collectively developed future scenarios and fictional treatments offer ways of making already existing but often normalized or insufficiently addressed crises and challenges experientially tangible, enabling participants to critically reflect on current infrastructures, regulations, and social practices. The workshops create a space for recognizing gaps, failures, and missing forms of care within present systems, while collectively exploring how these could be reimagined and transformed.

Combining the participation of policymakers and citizens holds further possibilities. In many cases, valuable forms of situated knowledge—particularly the lived experiences, environmental concerns, and everyday observations of citizens—remain disconnected from actual decision-making processes. Although communities often directly experience the consequences of ecological degradation and unhealthy urban environments, these experiences frequently become absorbed or stalled within bureaucratic systems, failing to meaningfully influence policy or structural change. Such workshops therefore hold the potential to function not only as speculative artistic platforms, but also as mediating tools capable of bridging this gap between citizen knowledge, scientific research, and institutional action.

Such an approach also repositions speculative artistic practice as a legitimate mode of knowledge production within urban and social planning. Rather than treating imagination as separate from governance, the workshops could create a platform for collective imaginaries to become productive starting points for tangible transformation. The identified issues and speculative proposals emerging from these processes could inform new approaches to urban development, public health infrastructures, environmental regulation, and social policy. By creating encounters between citizens, scientists, artists, and institutional actors, the project could open the possibility for forms of future-making in which local experiences and collective imagination are not excluded from political processes, but actively contribute to shaping them.

We have been seeking the necessary resources and institutional support for this, although present material realities have not yet enabled such possibilities. At the same time, this also reveals one of the central difficulties of transformative future-making: how potential can become material reality. While many sharp experiences and several promising concepts and alternative models emerge through artistic processes, their realization is often constrained by existing resources, institutional structures, policies, regulatory frameworks, and systemic limitations, which frequently prevent possibilities from being translated into tangible or bigger scale social and ecological change.

A great example to further demonstrate this phenomenon is the pilot microbial daycare which has been built by Tampere Municipality to bring an environmental health intervention to young children, inspired by the research in Finnish daycares presented earlier (Roslund, 2020, 2021). As part of the reconstruction of the former daycare in Pispala, the new facility was initiated to feature a custom “microbe-friendly” yard: instead of standard sterile asphalt or rubber, it has been built with untreated wood, logs, gravel, and diverse vegetation to maximize natural biodiversity. However, local policies and regulations largely determined the scope for change. Old trees, supporting diverse microbial communities,⁹⁶ were cut to create space for the new building. The space made available for the vegetation in the yard was reduced in order to expand parking areas and the snow collection site. Instead of creating natural climbing equipment, prefabricated ones were transported to the site due to easy maintenance, durability and safety, while microbial surfaces were completely excluded from the interior.

Discussions about the human body and microbial life have started already during the design of the new daycare among municipality personnel, daycare staff, families and Zsuzsa Millei, head of the Microbial Childhood Collaboratory. Parallel to the construction process, project *Restor(y)ing Daycare Ecologies*⁹⁷ (Aug 2024–July 2025) sought to raise attentiveness to these relations, as well as to develop conscious practices that create and promote diverse microbial environments in education and care. The regular presence of on-site members of the Collaboratory—local puppet artist and educator Erika Aalto, early childhood researchers Zsuzsa Millei and Jan Varpanen, and ecologist Mira Grönroos—created inquiry-based activities for children, educators, and families to explore and relate to the microbial world around them, which culminated in the development of microbial pedagogies. Both scientific and artistic activities offered ways to make microbes observable and senseable, in order to create awareness and new relations with microbes in an educational setting. This multidisciplinary art, social and natural science project aimed to weave the understanding of the ‘microbial child’ developed in human microbiome research into education to foster children’s health and wellbeing, and the biodiversity of the environment.

⁹⁶ From an ecological perspective, old trees can be understood as microbial reservoirs, accumulating and hosting complex multispecies communities over decades or centuries. Their extensive root systems, bark, foliage, rhizosphere, and their structural complexity provide conditions that many microorganisms cannot find in younger or more intensively managed environments.

⁹⁷ More detailed information about the research and activities:
<https://www.tuni.fi/en/research/microbial-childhood-restorying-daycare-ecologies>

We also appeared with public art interventions to engage families in forming microbial perspectives. In August 2025, a guerilla poster campaign took over the streets of Tampere and Hämeenlinna, calling attention to *missing kins*, lifeforms once thriving in our cities, and a human-sized gut invited families to rediscover these connections at Hippalot Festival (see Fig. 60–64). The posters directed the passers-by attention to orphaned urban trees longing for their mother’s⁹⁸ care, the concrete-covered soil beneath them yearning for the shelter of fallen leaves instead, and the hum of pollinators it once hosted, or microbial communities—eg. *Mycobacterium Vaccae*—whose number radically decreased in our cities. Inside the installation, *gut gardeners* guided visitors through a playful, sensorial and thought-provoking journey to reconnect to these missing kins. Children and families engaged with puppets, soundscapes, forest objects, and soil-based activities pointing to the presence—or absence—of microbes in everyday life. The experience highlighted how cleaning practices, urban design and lifestyles, and environmental changes shape our microbial relationships and health, for instance in the gut.

In the next phase of the project, *Restor(y)ing Daycare Ecologies II* (Aug 2026–July 2030), the research and artistic activities continue; Tampere-based members of the Collaboratory will have an ongoing presence in two local daycares, Tahmela and Pallervo daycares, while I will be responsible for designing and implementing artistic activities with families in diverse geographical and social settings to reflect on current microbial discourses and attitudes with a focus on media representation, with the purpose of reframing future ones.

While institutional and policy-level transformations may take time to materialise, the discussed art activities work in the present through public engagement, interventions in the imaginative sphere, accompanied by small-scale artistic prototypes, objects, and activities that provide microbial exposure. Such interventions may appear modest in comparison to systemic transformations, but their potential should not be underestimated. The experiences, reflections, and shifts in perception generated through these encounters can gradually extend beyond the immediate workshop or intervention setting, influencing how individuals relate to ecological issues, microbial communities, more-than-human life, and their own capacity for action. This does not mean abandoning the question of how microbial perspectives might inform change at a systemic level. Alongside working with broader publics, the project and activities continue to explore how their methodologies might be adapted to engage a wider range of audiences, including policymakers, planners, institutions, and other actors capable of catalysing systemic change.

⁹⁸ dr. Suzanne Simard describes large, older trees as “Mother Trees” because they act as highly connected hubs within mycorrhizal networks, facilitating the transfer of resources and information to surrounding seedlings and contributing to forest regeneration (Simard, 2021, p. 16-18).



Figure 60. *Microbial Childhood Collaboratory: Making Kin with Microbes*. 2025. Hippalot Festival, Hämeenlinna – Tampere, Finland. Photo: Eva Bubla



Figure 61. *Microbial Childhood Collaboratory: Making Kin with Microbes*. 2025. Hippalot Festival, Hämeenlinna – Tampere, Finland. Photo: Eva Bubla



Figure 62. Microbial Childhood Collaboratory: Missing Kins poster campaign. 2025. Hippalot Festival, Hämeenlinna – Tampere, Finland. Photo: Eva Bubla



Figure 63. Microbial Childhood Collaboratory: Missing Kins poster campaign. 2025. Hippalot Festival, Hämeenlinna – Tampere, Finland. Photo: Eva Bubla



Figure 64. *Microbial Childhood Collaboratory: Missing Kins poster campaign*. 2025. Hippalot Festival, Hämeenlinna – Tampere, Finland. Photo: Eva Bubla

5 CONCLUSIONS

This dissertation began with a practical and persistent question: *how can art catalyse change?* In the context of the planetary urgencies we face, this question has accompanied both my artistic and curatorial practice and the research undertaken. How can we trigger a shift in values, attitudes and actions, contribute to a turn in environmental and ecological issues, or bring about crucial system change? What forms of artistic practices and what roles can artists adopt to create the conditions for transformation? How can art respond to ecological crises without falling into the pitfalls of moralism or oversimplification? The research has approached these questions through three interconnected dimensions: reimagining public spaces, reimagining relations, and reimagining futures.

The first dimension examines public space as a site of engagement. Here, the catalytic potential of art lies partly in its capacity to bring ecological questions into spaces of everyday life and to create situations in which citizens can encounter these questions differently. Public space extends the reach of artistic practice beyond the conventional contexts of the art world, but its significance is not simply that it provides access to a larger audience. It creates opportunities for situated and embodied encounters in which meanings and possibilities can emerge collectively. Through participation, multisensory experience, dialogue and collaboration, artistic interventions can transform spectators into participants and public space into a temporary platform for exchange, collective learning and shared imagination. The projects examined in this research demonstrate that ecological issues do not necessarily become more meaningful through the more effective transmission of information. Rather, they can become meaningful when they are experienced: when a distant or abstract problem becomes connected to a particular place, body, memory, relationship or everyday practice. In this sense, artistic interventions can cultivate ecological attentiveness—not simply awareness of an issue, but a capacity to notice, sense and care differently. The public artwork can become an invitation to look again at what is already there.

This shift in attention opens onto a second way in which art can catalyse change: by reconfiguring relationships. Ecological crises are inseparable from the relationships between humans, other species, microorganisms, environments and infrastructures. To address them therefore requires more than adding non-human beings to an otherwise human-centred picture. It requires questioning the frameworks through which some forms of life become visible, valuable and worthy of care while others remain overlooked. The artistic practices examined here experiment with ways of attending to more-than-human agencies and of making ecological relations perceptible without reducing them to simple metaphors or representations. Through embodied encounters, situated research, immersion, speculation and processes of learning *with* places and assemblages of other forms of life, art can open spaces in which relationships that are normally imperceptible or taken for granted become noticeable. Its contribution is therefore not simply to represent more-than-human worlds, but to invite us to inhabit our relationships with them differently—the field of attention is expanded from isolated human subjects towards the interconnected systems and communities in which different forms of life exist together. In this way, artistic practice can foster new

forms of attachment, responsibility and care, transforming not only what is perceived but how relationships with the more-than-human world are understood and experienced.

Yet changes in perception and relations also raise the question of what might become possible as an outcome of those. The third dimension of the research therefore turns towards future-oriented artistic practice. There is no single predetermined future, but multiple possible futures, shaped by choices, relations, institutions, narratives and practices in the present. Artistic speculation can intervene in this process by reclaiming the capacity to imagine and creating situations in which alternative ecological and social relations can be collectively explored, negotiated and rehearsed. Through workshops, performances, installations, fictional narratives, role-playing and speculative artefacts, participants can temporarily inhabit alternative situations and systems. They can experiment with different forms of care, imagine different ecological arrangements, and rehearse possibilities that do not yet exist. The concept of future ecologies developed through this research describes this approach not as a fixed vision of a desirable future, but as an ongoing process of making alternative forms of coexistence and practices imaginable and experienceable. Its value lies less in providing solutions than in cultivating the capacity to identify present challenges, to recognise multiple possible futures and to perceive oneself as an active participant in their formation. In this sense, artistic speculation can catalyse change by making possibilities temporarily inhabitable and by opening the imaginative space from which different forms of action can emerge.

These three ways of working—making ecological conditions perceptible, reconfiguring relationships, and expanding the imaginable—are not separate strategies. They can reinforce one another. An encounter in public space can shift attention; shifted attention can open a different relationship to a place or form of life; a changed relationship can generate new forms of care; and new forms of care can make different futures imaginable and conceivable. The catalytic process can therefore move between perception, relation, imagination and action. What begins as an encounter with an ecological issue can become an experience of situated connection, which can in turn alter how participants understand their position within an ecological system and what they consider possible within it. The transformative potential of art lies partly in this capacity to create such chains of change rather than in delivering a single, predetermined effect.

These three dimensions also reveal that the catalytic potential of art does not reside in a single artistic format or methodology. The research began with a strong interest in collective practices shaped by my Indonesian experience and by the collectivist approaches I encountered there. Yet these practices could not simply be transplanted into the European contexts in which much of this research subsequently developed. They were transformed through different institutional structures, cultural conditions, artistic traditions and social relationships. What remained was not a particular model of community art, but a commitment to participation and collective processes. In my subsequent practice, this translated increasingly into audience participation, interventions in public space and collaborations across artistic, scientific, civic and institutional sectors. This shift has been important: rather than assuming that collectivism itself can be reproduced across contexts, the research has shown that methods of working must be continually negotiated with the people, places,

infrastructures and power relations in which they are situated. What travelled from one context to another was therefore less a method than a way of thinking about artistic practice as something produced with others rather than simply presented to them.

This has also changed my understanding of the artist's role. Throughout the research, working across disciplines, institutions and forms of knowledge has required the role of the artist to remain flexible, hybrid and responsive. Rather than occupying a fixed position, the artist may move between making, researching, facilitating, mediating, organising, curating, and creating the conditions for others to contribute. Such a role requires the capacity to negotiate different forms of knowledge, expertise, expectations and institutional contexts, while remaining attentive to what the project needs as it develops. It also requires a willingness to adapt, to allow the work and its methods to change through encounters with participants, collaborators and places, and, when necessary, to let go of ideas, roles or forms that no longer serve the process. In this sense, artistic practice is not a fixed methodology but an ongoing process of adjustment, learning and becoming. The research has also brought me to a more personal question concerning the conditions that make such a practice possible. A practice committed to ecological and social transformation cannot depend upon the unsustainable exploitation of the artist who sustains it. Maintaining the capacity to continue creating, questioning, adapting and caring is therefore not separate from the practice, but part of the responsibility that comes with it.

This brings me back to the notion of the *catalyst*. A catalyst, in its scientific definition, increases the rate of a reaction without undergoing permanent chemical change. Artistic catalysis differs from this in a fundamental way: the artistic practice itself changes through the process. The encounters it creates transform the artwork, the methodology, the relationships between those involved, the knowledge produced and, ultimately, the position of the artist. This became increasingly evident throughout the research. Projects evolved through participation and collaboration; questions changed through encounters with scientific and situated knowledge; and artistic methodologies were repeatedly adapted to the people, places and circumstances in which they were enacted. Artistic catalysis is therefore reciprocal. It is not the controlled application of a method to produce a predetermined transformation, but an open-ended process in which the work itself remains capable of being changed.

This reciprocity also points towards an important characteristic of artistic practice as a form of ecological inquiry. The research has brought scientific knowledge, situated experience, embodied perception, artistic experimentation and speculative imagination into dialogue. Through this process, artistic practice can do more than communicate existing knowledge. It can generate questions, reveal relationships, expose gaps in existing systems, and create forms of knowledge that emerge through participation and experience. The artistic process can therefore become a space in which ecological conditions are not only represented or discussed, but investigated, sensed and collectively reimagined. This is particularly significant in relation to complex ecological systems that cannot be fully grasped through detached observation or information alone.

At the same time, the transformations initiated through artistic practice do not automatically extend into systemic change. The research does not claim that shifts in perception, attention, relationships, care, imagination or action will, by themselves, alter institutions, policies, infrastructures or wider systems. Their development and continuation depend on political, economic, institutional and social conditions that exceed the reach of an individual artistic project. The scale and duration of artistic impact are therefore partly determined by the networks, institutions, resources and structures through which a practice can circulate and be sustained. This does not diminish the transformative potential of art. Rather, it places artistic catalysis within a larger ecology of change. A shift in perception can be a first step; a new relationship can become a basis for care; an imagined alternative can become a starting point for action. Whether such shifts develop into broader and more sustained forms of transformation depends on what happens beyond the artistic encounter itself, but also on the continuity and accumulation of encounters.

What this research therefore offers is not a recipe for making transformative art, but an understanding of the conditions and practices through which art can catalyse change. Across the practices examined, catalysis emerges through creating situations in which something can shift: what becomes perceptible, what receives attention, how relationships are understood, what forms of care become possible, and what futures can be imagined. These shifts do not follow a predictable sequence, nor can their consequences be fully controlled. They can emerge through an encounter in public space, through learning with other forms of life, through the exchange of different kinds of knowledge, or through the temporary experience of a future that does not yet exist. What matters is not that an artwork produces a measurable outcome, but that it can set transformation in motion. Its catalytic potential therefore lies in opening possibilities that did not exist—or were not yet perceptible—before the encounter.

This also means that artistic catalysis is inherently relational and reciprocal. The catalyst changes along with what it catalyses: artistic practices, methodologies, relationships and positions are themselves transformed through encounters with participants, places, disciplines and more-than-human worlds. The artist does not stand outside this process as its sole initiator, but becomes part of the changing ecology that the practice helps to create. The artist's role is therefore less to determine what change should look like than to create and hold spaces in which different forms of attention, relation, imagination and action can emerge.

The answer to the question with which this dissertation began—how can art catalyse change?—is therefore not a particular format, method or formula. Art can catalyse change by creating conditions in which people and communities can perceive differently, relate differently, care differently and imagine differently, and from which different forms of action may become possible. Whether these shifts remain momentary or develop into longer-term social and ecological transformation depends on the conditions that surround and sustain them. But the first movement matters. A change does not begin only when a system has been transformed; it can begin when something becomes perceptible, when a relationship is reconsidered, when care is extended, or when another possibility becomes imaginable. Art's catalytic potential lies in its capacity to set such movements in motion—and to be changed by the process itself.

References

books, articles, publications

- Al Nabhani, Z., & Eberl, G. (2020). Imprinting of the immune system by the microbiota early in life. *Mucosal Immunology*, 13, 183–189. <https://doi.org/10.1038/s41385-020-0257-y>
- Alonso, G. (2024). Matter as kin: A non-binary (nature-culture) matter future. Institute for Postnatural Studies
- Arlander, A. (2017). Artistic research as speculative practice. *Journal for Artistic Research*. <https://doi.org/10.22501/jarnet.0001>
- Baedke J., Fábregas-Tejeda A., & Nieves Delgado A. (2020). The holobiont concept before Margulis. *Journal of Experimental Zoology Part B: Molecular and Developmental Evolution*. <https://doi.org/10.1002/jez.b.22931>
- Barone, T., & Eisner, E. W. (2012). *Arts based research*. SAGE Publications.
- Beard, V. A., & Dasgupta, A. (2006). Collective action and community-driven development in rural and urban Indonesia. *Urban Studies*, 43(9), 1451–1468. <https://doi.org/10.1080/00420980600749944>
- Becker, C. (2012). Microutopias: Public practice in the public sphere. In N. Thompson (Ed.), *Living as form: Socially engaged art from 1991–2011* (pp. 64–71). MIT Press.
- Bendiks, M., & Kopp, M. V. (2013). The relationship between advances in understanding the microbiome and the maturing hygiene hypothesis. *Current Allergy and Asthma Reports*, 13(5), 487–494. <https://doi.org/10.1007/s11882-013-0382-8>
- Bishop, C. (2006). The social turn: Collaboration and its discontents. *Artforum*, 44(6), 178–183.
- Bolt, B. (2013). The magic is in handling. In M. Biggs & H. Karlsson (Eds.), *The Routledge companion to research in the arts* (pp. 27–34). Routledge.
- Borgdorff, H. (2012). *The conflict of the faculties: Perspectives on artistic research and academia*. Leiden University Press.
- Bourriaud, N. (2002). *Relational aesthetics* (S. Pleasance & F. Woods, Trans.). Les Presses du Réel.
- Braidotti, R. (2013). *The posthuman*. Polity Press.
- Bubla, É. (2021). Kollaboratív jövőképek: A művészeti gyakorlatok és a környezeti nevelés kapcsolódásai. *Tranzitblog*.

<http://tranzitblog.hu/kollaborativ-jovokepek-a-muveszeti-gyakorlatok-es-a-kornyezeti-nevels-kapcsolodasai/>

Bubla, É. (2022). Gudskul: Kollektív gyakorlatok és ökoszisztémák. *Új Művészet*, 33(9), 4–8.

Candy, L., & Edmonds, E. (2018). Practice-based research in the creative arts: Foundations and futures from the front line. *Leonardo*, 51(1), 63–69.

Candy, S., & Dunagan, J. (2017). Designing an experiential scenario: The people who vanished. *Futures*, 86, 136–153.

Conklin, B. A. (2026). Microbes and fieldwork: Reflections toward a (micro)biosocial anthropology. *Suomen Antropologi: Journal of the Finnish Anthropological Society*, 50(1), 90–113. <https://doi.org/10.30676/jfas.146854>

Cosier, S. (2019, May 30). The world needs topsoil to grow 95% of its food—but it’s rapidly disappearing. *The Guardian*.
<https://www.theguardian.com/us-news/2019/may/30/topsoil-farming-agriculture-food-toxic-america>

Crenshaw, K. (2006). Mapping the margins: Intersectionality, identity politics and violence against women of color. *Kvinder, Køn & Forskning*, (2–3), 7–20.

Crutzen, P. J. (2002). Geology of mankind. *Nature*, 415, 23. <https://doi.org/10.1038/415023a>

de la Bellacasa, M. P. (2017). *Matters of care: Speculative ethics in more than human worlds*. University of Minnesota Press.

Demos, T. J. (2016). *Decolonizing nature: Contemporary art and the politics of ecology*. Sternberg Press.

Dimpfl, M. (2018). Micro(bial) management: Everyday cleanliness and the divisive power of hygienic worries. *Cultural Geographies*, 25(1), 201–216.
<https://doi.org/10.1177/1474474017724478>

Dunne, A., & Raby, F. (2013). *Speculative everything: Design, fiction, and social dreaming*. MIT Press.

Escobar, A. (2016). Thinking-feeling with the Earth: Territorial struggles and the ontological dimension of the epistemologies of the South. *Revista de Antropología Iberoamericana*, 11(1), 11–32. <https://doi.org/10.11156/aibr.110102e>

Filipovic, E. (2013). *The artist as curator: An anthology*. Mousse Publishing.

Fishel, S. R. (2017). *The microbial state: Global thriving and the body politic*. University of Minnesota Press. <https://doi.org/10.5749/j.ctt1pwt5z8>

- Fisher, M. (2009). *Capitalist realism: Is there no alternative?* Zero Books.
- Gablik, S. (1995). *Conversations before the end of time*. Thames & Hudson.
- Grönroos M, Parajuli A, Laitinen OH, et al. (2019). Short-term direct contact with soil and plant materials leads to an immediate increase in diversity of skin microbiota. *MicrobiologyOpen*, 8, e00645. <https://doi.org/10.1002/mbo3.645>
- Guattari, F. (1989). The three ecologies (C. Turner, Trans.). *New Formations*, 8, 131–147
- Haahtela, T. (2019). A biodiversity hypothesis. *Allergy*, 74(8), 1445–1456. <https://doi.org/10.1111/all.13763>
- Hansen, J. E. (2001, July 18). *Statement of Dr. James E. Hansen, Head NASA Goddard Institute for Space Studies, before the Committee on Governmental Affairs, United States Senate*. <https://www.hsgac.senate.gov/wp-content/uploads/imo/media/doc/hansen.pdf>
- Haraway, D. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Duke University Press.
- Hawkins, H. (2017). Foreword: Arts works: Art worlds—scales, spaces, scapes. In J. Luger & J. Ren (Eds.), *Art and the city: Worlding the discussion through a critical artscape* (pp. xvi–xix). Routledge.
- Istvánovics, V., Honti, M., Torma, P., & Kousal, J. (2022). Record-setting algal bloom in polymictic Lake Balaton (Hungary): A synergistic impact of climate change and (mis)management. *Freshwater Biology*, 67(6), 1091–1106. <https://doi.org/10.1111/fwb.13903>
- Jeffery, C. (Ed.). (2015). *The artist as curator*. Intellect.
- Julaikha, S., & Bahri, S. (2014). Nilai-nilai gotong-royong dalam masyarakat petani padi sawah di Desa Sungai Siput Kecamatan Siak Kecil Kabupaten Bengkalis. *JOM FISIP*, 1(2), 1–13. <https://jom.unri.ac.id/index.php/JOMFISIP/article/view/3306>
- Kuzmanovic, M., & Gaffney, N. (2017). Enacting futures in postnormal times. *Futures*, 86, 107–117. <https://doi.org/10.1016/j.futures.2016.05.007>
- Kuzmanovic, M., & Gaffney, N. (2019). *The art of futuring: Unknown, unknowable and uncertain*. Medium. <https://foam.medium.com/the-art-of-futuring-2914938ec4ad>
- Lee, N. (2013). *Childhood and biopolitics: Climate change, life processes, and human futures*. Palgrave Macmillan. <https://doi.org/10.1057/9781137317186>
- Lee, N., & Motzkau, J. (2012). The biosocial event: Responding to innovation in the life sciences. *Sociology*, 46(3), 426–441. <https://doi.org/10.1177/0038038511422554>

Levitas, R. (2013). *Utopia as method: The imaginary reconstitution of society*. Palgrave Macmillan.

Lind, M. (2010). *Performing the curatorial: Within and beyond art*. Sternberg Press.

Lorimer, J. (2017). Probiotic environmentalities: Rewilding with wolves and worms. *Theory, Culture & Society*, 34(4), 27–48. <https://doi.org/10.1177/0263276417695866>

Lorimer, J. (2019). Hookworms make us human: The microbiome, eco-immunology, and a probiotic turn in Western health care. *Medical Anthropology Quarterly*, 33(1), 60–79. <https://doi.org/10.1111/maq.12466>

Marko, P., & Lisa, R. (2022). *Meanwhile city: How temporary interventions create welcoming places with a strong identity*. Milk.

Massumi, B. (2002). *Parables for the virtual: Movement, affect, sensation*. Duke University Press.

McFall-Ngai, M. (2017). Noticing microbial worlds: The postmodern synthesis in biology. In A. L. Tsing et al. (Eds.), *Arts of living on a damaged planet: Ghosts and monsters of the Anthropocene* (pp. 51–69). University of Minnesota Press.

Meadow, J. F., Altrichter, A. E., Bateman, A. C., Stenson, J., Brown, G., Green, J. L., & Bohannan, B. J. M. (2015). Humans differ in their personal microbial cloud. *PeerJ*, 3, e1258. <https://doi.org/10.7717/peerj.1258>

Michelkevičius, V. (2018). *Mapping artistic research: Towards diagrammatic knowing*. Vilnius Academy of Arts Press.

Millei, Z. (2026). Childhood in a bacterial world: Anthropogenic biology for the global studies of childhood. *Global Studies of Childhood*, 16(1), 76–89. <https://doi.org/10.1177/20436106251398515>

Millei, Z., Lee, N., Spyrou, S., Roslund, M., Breinholt, A., Tammi, T., Conklin, B., Alminde, S., Warming, H., & Hohti, R. (2025). Child ecologies in a microbial world: A new imperative for childhood studies. *Journal of Childhood Studies*, 50(1), 34–52. <https://doi.org/10.18357/jcs501202521918>

Mogyoróssy, M. (2024). Through body, mind and soul—Reconnecting with the city. *IN SITU Narrative*. <https://www.in-situ.info/through-body-mind-and-soul-reconnecting-with-the-city>

Morton, T. (2007). *Ecology without nature: Rethinking environmental aesthetics*. Harvard University Press.

Niu, J., Xu, H., Zeng, G., Wang, P., Racine, B., Nawaz, S., Zeng, Z., & Zhao, J. (2023). Music-based interventions in the feeding environment on the gut microbiota of mice. *Scientific Reports*, 13, 6313. <https://doi.org/10.1038/s41598-023-33522-3>

Nordic Council of Ministers. (n.d.). *Facts about Norway*.

<https://www.norden.org/en/information/facts-about-norway>

O'Neill, P. (2012). *The culture of curating and the curating of culture(s)*. MIT Press.

Orbán, K. (2024). Városban a hallgatás erejével: PLACCC Extra. *Revizor*.

<https://revizoronline.com/placcc-extra/>

Ostendorf, Y. (2017). *Creative responses to sustainability: Cultural initiatives engaging with social and environmental issues—Indonesia guide*. Asia-Europe Foundation.

Patmont, E., Jalalizadeh, M., Bokare, M., Needham, T., Vance, J., Greene, R., Cargill, J., & Ghosh, U. (2020). Full-scale application of activated carbon to reduce pollutant bioavailability in a 5-acre lake. *Journal of Environmental Engineering*, 146(5), 04020024.

[https://doi.org/10.1061/\(ASCE\)EE.1943-7870.0001667](https://doi.org/10.1061/(ASCE)EE.1943-7870.0001667)

Project for Public Spaces. (2008, December 1). *What is placemaking?*

<https://www.pps.org/article/what-is-placemaking>

Ratnasari, A., Sitorus, S. R. P., & Tjahjono, B. (2015). Perencanaan Kota Hijau Yogyakarta berdasarkan penggunaan lahan dan kecukupan RTH (Yogyakarta Green City Planning based on land use and adequacy of green open space). *Tata Loka*, 17(4), 196–208.

Redford, K. (2023). Extending conservation to include Earth's microbiome. *Conservation Biology*, 37(3), e14088. <https://doi.org/10.1111/cobi.14088>

Richter, D. (2013). Artists and curators as authors—Competitors, collaborators, or teamworkers? In M. Birchall & D. Richter (Eds.), *On artistic and curatorial authorship*.

[OnCurating.org](https://oncurating.org).

Riva, V., Riva, F., Vergani, L., Crotti, E., Borin, S., & Mapelli, F. (2020). Microbial assisted phytodepuration for water reclamation: Environmental benefits and threats. *Chemosphere*, 241, 124843. <https://doi.org/10.1016/j.chemosphere.2019.124843>

Roslund, M. I., Puhakka, R., Nurminen, N., Oikarinen, S., Siter, N., Grönroos, M., Cinek, O., Kramná, L., Jumpponen, A., Laitinen, O. H., Rajaniemi, J., Hyöty, H., & Sinkkonen, A. (2021). Long-term biodiversity intervention shapes health-associated commensal microbiota among urban day-care children. *Environment International*, 157, 106811.

<https://doi.org/10.1016/j.envint.2021.106811>

Roslund, M. I., Puhakka, R., Grönroos, M., Nurminen, N., Oikarinen, S., Gazali, A. M., Cinek, O., Kramná, L., Siter, N., Vari, H. K., Soininen, L., Parajuli, A., Rajaniemi, J., Kinnunen, T., Laitinen, O. H., Hyöty, H., & Sinkkonen, A. (2020). Biodiversity intervention enhances immune regulation and health-associated commensal microbiota among daycare children. *Science Advances*, 6(42), eaba2578. <https://doi.org/10.1126/sciadv.aba2578>

Salas, C. (2020). What should we expect from art in the next few years/decades? And what is art, anyway? *Medium*.

<https://carmensp.medium.com/what-should-we-expect-from-art-in-the-next-few-years-decades-and-what-is-art-anyway-be9f75c3d1ae>

Sick-Leitner, M. (2015, September 30). SOYA C(O)U(L)TURE—Useful things arise out of waste. *Ars Electronica Blog*. <https://ars.electronica.art/aeblog/en/2015/09/30/soya-coulture/>

Simard, S. (2021). *Finding the mother tree: Discovering the wisdom of the forest*. Alfred A. Knopf.

Smith, V. H., Tilman, G. D., & Nekola, J. C. (1999). Eutrophication: Impacts of excess nutrient inputs on freshwater, marine, and terrestrial ecosystems. *Environmental Pollution*, 100(1–3), 179–196. [https://doi.org/10.1016/S0269-7491\(99\)00091-3](https://doi.org/10.1016/S0269-7491(99)00091-3)

Statista Research Department. (2026, April 8). *Annual carbon dioxide (CO₂) emissions worldwide from 1940 to 2025*. Statista.

<https://www.statista.com/statistics/276629/global-co2-emissions/>

Taylor, A. (2017). Beyond stewardship: Common world pedagogies for the Anthropocene. *Environmental Education Research*, 23(10), 1448–1461.

<https://doi.org/10.1080/13504622.2017.1325452>

Ternai, J. (2021). Több érzékszerven keresztül hatni: Interjú Bubla Évával és Nánay Fannival a Sensing the City eseménysorozatról és a keretet adó PLACCC Fesztiválról. *PRAE.HU*.

<https://www.prae.hu/article/12632-tobb-erzekszerven-keresztul-hatni/>

Thompson, N. (Ed.). (2012). *Living as form: Socially engaged art from 1991–2011*. MIT Press.

Tihanyi, D. (2008). Kreatív stratégiák és a köztéri művészet szerepe a városfejlesztésben. *Építészfórum*.

<https://epiteszforum.hu/kreativ-strategiak-es-a-kozteri-muveszet-szerepe-a-varosfejlesztesben>

Tihanyi, D. (2016). The role of durational art strategies in urban regeneration in Budapest. *SPOOL*, 3(2), 39–58. <https://doi.org/10.7480/spool.2016.2.1393>

Time's Up. (2022). *Futures brought to life: From immersion via agency to engagement* [Symposium booklet]. University of Applied Arts Vienna. [Futures Brought to Life booklet](#)

Tsing, A. L. (2015). *The mushroom at the end of the world: On the possibility of life in capitalist ruins*. Princeton University Press.

Ulfeng, H. (2019, July 23). Ti fakta om matjorda på Gudebergjordet [Ten facts about the topsoil at Gudebergjordet]. *Fredrikstad Blad*.

<https://www.f-b.no/ti-fakta-om-matjorda-pa-gudebergjordet/o/5-59-1557092>

United Nations News. (2022, July 28). *UN General Assembly declares access to clean and healthy environment a universal human right*. United Nations.
<https://news.un.org/en/story/2022/07/1123482>

van der Loo, M. (2021). *The vegetal curator: Plants as agents of decoloniality in curatorial and pedagogical processes*. Aalto University.

Varga, T. (2013). DLA. In Á. Eőri, B. Kicsiny, M. Peternák, Z. Szegedy-Maszák, & R. Szőcs (Eds.), *Hungarian University of Fine Arts Doctoral School* (pp. 27–38). Hungarian University of Fine Arts.

Varga, T. (2019). The power of imagination? Aesthetic autonomy and critique in contemporary art. *antae*, 6(2–3), 74–86.

von Hertzen, L., Hanski, I., & Haahtela, T. (2011). Natural immunity. *EMBO Reports*, 12(11), 1089–1093. <https://doi.org/10.1038/embor.2011.195>

Wei, X., Lyu, S., Yu, Y., Wang, Z., Liu, H., Pan, D., & Chen, J. (2017). Phylloremediation of air pollutants: Exploiting the potential of plant leaves and leaf-associated microbes. *Frontiers in Plant Science*, 8, 1318. <https://doi.org/10.3389/fpls.2017.01318>

World Meteorological Organization. (2025, January 10). *WMO confirms 2024 as warmest year on record at about 1.55°C above pre-industrial level*.
<https://wmo.int/news/media-centre/wmo-confirms-2024-warmest-year-record-about-155degc-above-pre-industrial-level>

Wolverton, B. C., Johnson, A., & Bounds, K. (1989). *Interior landscape plants for indoor air pollution abatement* (NASA Technical Memorandum NASA-TM-101766). National Aeronautics and Space Administration. <https://ntrs.nasa.gov/citations/19930073077>

World Wildlife Fund. (n.d.). *Monarch butterfly*.
<https://www.worldwildlife.org/species/monarch-butterfly>

Yong, E. (2016). *I contain multitudes: The microbes within us and a grander view of life*. Ecco.

legal and policy documents

City of Yogyakarta. (2013). *Peraturan Walikota Yogyakarta Nomor 64 Tahun 2013 tentang Permohonan, Pengadaan dan Pemanfaatan Tanah untuk Ruang Terbuka Hijau Publik sebagai Fasilitas Penunjang Kegiatan Masyarakat* [Mayor Regulation No. 64/2013]. [JDIH Pemerintah Kota Yogyakarta](#)

Paris Agreement. (2015). United Nations Framework Convention on Climate Change.
https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf

The Constitution of the Kingdom of Norway. (1814/2024). Section 112.

<https://lovdata.no/dokument/NLE/lov/1814-05-17>

United Nations Conference on Environment and Development. (1992). *Agenda 21*. United Nations. <https://sdgs.un.org/publications/agenda21>

World Commission on Environment and Development [WCED]. (1987). *Report of the World Commission on Environment and Development: Our common future*. United Nations. <https://digitallibrary.un.org/record/139811>

conferences, public talks, seminars

Attenborough, D. (2018, December 3). *People's Seat Address at COP24* [Speech]. United Nations Framework Convention on Climate Change. <https://unfccc.int/documents/185211>

Gitzen, T. (2026, April 10). *Speculating microbes, speculative ethnography* [Public talk]. Center for the Social Study of Microbes.

Levitas, R., Garforth, L., Coleman, R., & Jungnickel, K. (2024, September 12). *Why we (still) need utopian thinking now* [Plenary session]. Undisciplining II, The Lowry, Salford, Greater Manchester, UK.

research materials, interviews, and fieldwork

SENSING THE CITY: Urban Dialogues (Városdialógusok), 2021–2025

Possible alternatives to agricultural production and the producer-consumer relationship. (2021, September 1). Thematic discussion, SENSING THE CITY: Urban Dialogues. With Fuzzy Earth (Tekla Gedeon and Sebastien Gschanes) and Orsolya Lazányi; moderated by Viktória Lay.

Waste management and circular economy. (2021, September 2). Thematic discussion, SENSING THE CITY: Urban Dialogues. With Katalin Kortmann-Járay, Bálint Katona, Gábor Kanozsai, and László Sámson; moderated by Viktória Lay.

Ecological grief. (2021, September 5). Thematic discussion, SENSING THE CITY: Urban Dialogues. With Kinga Szemessy, Napsugár Trömböczky, Luca Borsos, and Zselyke Molnos; moderated by Marietta Mogyorósy.

The role of long-term artistic experimentation and creative practices in community building. (2021, September 5). Thematic discussion, SENSING THE CITY: Urban Dialogues. With Bori Sinkó, Gyöngyi Barta, Aletta Erdős, Lili Gárdos, Andrea Szakál, and Flóra Madácsi; moderated by Ildikó Fazekas.

Smellwalk and thematic talk. (2022, September 4). Public event and thematic discussion, SENSING THE CITY: Urban Dialogues. With Éva Bubla and Judit Szegő; moderated by Anett Mogyorósy.

Who owns the energy? (2022, September 5). Thematic discussion, SENSING THE CITY: Urban Dialogues. With Seth Honnor and Kata Győri.

The role of green areas in air quality abatement and the urban microclimate. (2023, September 6). Thematic discussion, SENSING THE CITY: Urban Dialogues. With Éva Bubla, Judit Szegő, and Sándor Bardóczi; moderated by Ildikó Fazekas.

The future of water. (2024, September 3). Thematic discussion, SENSING THE CITY: Urban Dialogues. With Anita Patonay, Viktor Bori, and Bence Fülöp; moderated by Marietta Mogyorósy.

Disappearing public spaces & growing urban developments. (2024, September 5). Thematic discussion, SENSING THE CITY: Urban Dialogues. With Boglárka Jakabfi-Kovács and András Lányi; moderated by Péter Hámori.

Talk on microbial art & science. (2024, September 6). Thematic discussion, SENSING THE CITY: Urban Dialogues. With Csilla Hódi / Planty Warhol and István Parádi; moderated by Marietta Mogyorósy.

Layers of Water. (2024, September 8). Thematic discussion, SENSING THE CITY: Urban Dialogues. With Eva Freund, Dóra Gere, and Ármin Tillmann; moderated by Cili Lohász.

Laws of the Dandelion. (2025, September 14). Thematic discussion, SENSING THE CITY: Urban Dialogues. With Viktória Kaslik and Bence Petővári; moderated by Marietta Mogyorósy.

interviews, questionnaires, research workshops

Bubla, É. (2018). *Background interviews and conversations with members of HONF Foundation, Ketemu Space, Limbah Berbunyi, and SURVIVE! Garage* [Fieldwork notes/interviews].

Bubla, É. (2022, January 15–19). *Background interviews and conversations with representatives of Art Collective Compound (ACC), ruangrupa, Selarasa Foodlab, and Gudskul, Jakarta, Indonesia* [Fieldwork notes/interviews].

Bubla, É. (2025). *SENSING THE CITY: Feedback questionnaire with participating artists* [Unpublished research material].

Microbial Childhood Collaboratory. (2022). *On-site meeting #1, Helsinki, Finland* [Research workshop].

Microbial Childhood Collaboratory. (2023). *On-site meeting #2, Hvalsø, Denmark* [Research workshop].

artistic works and projects

Barotti, M. (2018). *Clams* [Kinetic installation]. <https://www.marcobarotti.com/Clams>

Bellinkx, J. (2023). *What is it like to be another living creature? Chapter: Tree* [Artistic research project].

Brother Nut. (2015). *Project Dust* [Performance]. Beijing, China.

Bubla, E. (2022–2023). *Gudebergjordet Protection Agency* [Artistic concept developed for Østfold Internasjonale Teater, Fredrikstad, Norway].

Bubla, E. (2023). *Resting with the Land* [Artistic research project and workshop series]. Gudebergjordet, Fredrikstad, Norway

Bubla, E. (2023–). *Microbial Futures Lab* [Participatory art project].
<http://evabubla.art/microbial-futures-lab>

Bubla, E. (2023–). *Designated Breathing Zone 2.0* [Interactive installation].
<http://evabubla.art/designated-breathing-zone-2>

Bubla, E. (2024–). *Designated Breathing Zone 3.0* [Interactive installation]. Presented at PLACCC Extra, Budapest, Hungary. <http://evabubla.art/designated-breathing-zone-3-0> and <https://www.youtube.com/watch?v=p0laqfQdEDc&t=42s>

Cerpina, Z., & Stenslie, S. (2022). *The Anthropocene Cookbook* [Artistic research project and publication]. MIT Press. <https://anthropocenecookbook.com>

Climaginaires. (2019–). *Carbon Ruins* [Exhibition]. First presented at Lund University, Lund, Sweden, 2019. <https://www.climaginaires.org/carbon-ruins>

Cuevas, M. (2007–). *Seascapes* [Painting, part of *Hydrocarbons Series*].
<https://www.minervacuevas.org/works/serie-hidrocarburos>

Dusts Institute. (2021–). *Dust-free Chamber* [Immersive installation].
<https://dustsinstitute.org/installations>

Esparza, G. (2008–2014). *Plantas nómadas (Nomadic Plants)* [Bio-robotic art and research project]. <https://www.plantasnomadas.com>

Freund, E. (2024). *Layers of Water* [Installation and workshop] Presented at PLACCC / SENSING THE CITY, Budapest, Hungary.

- Fuzzy Earth. (2021). *Not Quite California Wonder* [Research-based art and design project].
- Gosztola, K., & Pálincás, B. G. (2018–). *Wild Garden Utopia*. [Participatory art project].
- GRAM Art Project. (2016). *Grow in India* [Community-based art and farming project]. Paradsinga, India.
- Greenfort, T. (2007/2014). *Exceeding 2°C* [Installation and environmental intervention]. First presented at *Still Life: Art, Ecology and the Politics of Change*, Sharjah Biennial 8, Sharjah, United Arab Emirates, 2007; later presented at *7 000 000 000*, EACC, Castellón, Spain, 2014. <https://www.tuegreenfort.com/exceeding2-degrees>
- Henderson, T. (2023). *Worm Affair* [Installation]. Presented at Helsinki Biennial 2025, Vallisaari Island, Helsinki, Finland.
- Hódi, C., lutz&bog, & Planty Warhol. (2024). *Micro-cruising* [Performative walk]. Presented at PLACCC / SENSING THE CITY, Budapest, Hungary.
- Holten, K. (2025). *Learning to Be Better Lovers* [Participatory art project]. Presented at Helsinki Biennial 2025, Esplanade Park and Vallisaari Island, Helsinki, Finland. <https://www.katieholten.com/forest-thinking>
- Idema, E. (2024). *School of Unlived Worlds* [Participatory artistic project]. <https://www.emkeidema.nl/en/school-of-unlived-worlds>
- Jakabfi-Kovács, B. (2024). *What You See: A Public Affair* [Interactive installation]. Presented at PLACCC / SENSING THE CITY, Budapest, Hungary.
- Jeschaunig, M. (2015–2016). *Oasis No. 8* [Participatory installation and community project]. Graz, Austria. <https://agencyinbiosphere.com/archives/project/oasis-no-8>
- Kaslik, V. (2025). *Dandelion Feast: A Protocol to Eliminate Legal Waste from Earth Bodies* [Lecture].
- Ketemu Project Space. (2015). *Danau Imajinasi Kami (Our Lake of Imagination)* [Community-based artistic project]. Lake Batur, Bali, Indonesia. <https://ketemu.org/id/projects/danau-imajinasi-kami>
- Kortmann-Járay, K., Katona, B., & Kaprinyák, A. (2021). *Fireworks* [Multimedia installation]. Presented at PLACCC / SENSING THE CITY, Budapest, Hungary.
- Lifepatch. (2014). *Jogja River Project* [Community-based artistic research project]. Yogyakarta, Indonesia. https://lifepatch.id/Jogja_River_Project_2014
- LUIT. (2020–). *Manual of Adaptation to the Planet* [Participatory performance]. <https://en.luit.fr/manuel-dadaptation-a-la-planete>

- Microbial Childhood Collaboratory. (2025). *Making Kin with Microbes* [Interactive installation and workshop]. Presented at Hippalot Festival, Hämeenlinna, Finland.
- Microbial Childhood Collaboratory. (2025). *Missing Kins* [Guerrilla poster campaign]. Hämeenlinna and Tampere, Finland.
- MOME. (2021). *Tolna Sound Garden* [Participatory sound art project at Tolna Garden, Budapest].
- Patonay, A., & Bori, V. (2024). *Water Level* [Participatory performance and debate theatre]. Presented at PLACCC / SENSING THE CITY, Budapest, Hungary.
- Saarinen, R. (2025). *Invasive Scent* [Olfactory installation]. Presented at Helsinki Biennial 2025, Vallisaari Island, Helsinki, Finland.
- Serrum. (2015–). *Pasar Ilmu (Knowledge Market)* [Participatory art and educational project]. <https://serrum.id/pasar-ilmu>
- Staal, J. (2019). *Interplanetary Species Society* [Installation and assembly]. Reaktorhallen, Stockholm, Sweden. <https://www.jonasstaal.nl/projects/interplanetary-species-society>
- SVUNG. (2021). *No Endpoint* [Performative vigil]. Presented at PLACCC / SENSING THE CITY, Budapest, Hungary.
- szabadonbalaton. (2021–). *C:N:P bar* [Concept bar]. <https://www.szabadonbalaton.hu/szb%20concept%20bar.html>
- Újirány Group. (2008–2012). *Pre-rehabilitation of Palotanegyed* [Durational public art project]. Budapest, Hungary.
- XXLab. (2015). *SOYA C(O)U(L)TURE* [Research-based art, science & technology project]. Presented at Ars Electronica Festival, Linz, Austria, 2015. <https://ars.electronica.art/aeblog/en/2015/09/30/soya-coulture>

List of images

Figure 1. *Xxlab: Soya C(o)u(l)ture*. 2015. Ars Electronica, Linz, Austria. Photo: Florian Voggeneder. Source: <https://ars.electronica.art/aeblog/en/2015/09/30/soya-coulture>

Figure 2. *Lifepatch: Jogja River Project*. 2014. Yogyakarta, Indonesia. Image source: artist's website. https://lifepatch.id/Jogja_River_Project_2014

Figure 3. *Ketemu: Danau Imajinasi Kami (Our Lake of Imagination)*. 2015. Lake Batur, Indonesia. Image source: artist's website. <https://ketemu.org/id/projects/danau-imajinasi-kami>

Figure 4. *Serrum: Pasar Ilmu (Knowledge Market)*. 2021. Yamaguchi Center for Arts and Media (YCAM), Japan. Photo: Yasuhiro Tani. Source: <https://www.ycam.jp/en/events/2021/knowledge-market>

Figure 5. *Dust Institute: Dust-free Chamber*. 2021. Image source: artist's website. <https://dustsinstitute.org/installations>

Figure 6. Brother Nut, Project Dust, 2015. Performance in Beijing, China. Photo: Dong Dalu/CFP. Source: <https://www.nytimes.com/2015/12/02/world/asia/beijing-smog-air-pollution-artist-brick.html>

Figure 7. *Marco Barotti: Clams*. 2018. Image source: artist's website. <https://www.marcobarotti.com/Clams>

Figure 8. *Gilberto Esparza: Nomadic Plants*. 2008-2014. Image source: artist's website. <https://www.plantasnomadas.com>

Figure 9. *Raimo Saarinen: Invasive Scent*. 2025. Helsinki Biennial 2025, Vallisaari Island. Photo: HAM / Helsinki Biennial / Sonja Hyytiäinen. Source: <https://helsinkibiennaali.fi/en/artist/raimo-saarinen>

Figure 10. *Zane Cerpina & Stahl Stenslie: Anthropocene Cookbook*. 2022. Image source: artist's website. <https://anthropocenecookbook.com>

Figure 11. *szabadonbalaton: C:N:P bar*. 2021. Photo: Neogrády-Kiss Barnabás / szabadonbalaton. Source: <https://www.szabadonbalaton.hu/projektek.html>

Figure 12. *Katie Holten: Learning To Be Better Lovers (Forest Alphabet)*, 2025, detail. Helsinki Biennial 2025, Esplanade Park. Photo: HAM / Helsinki Biennial / Henni Hyvärinen. Source: <https://helsinkibiennaali.fi/en/artist/katie-holten>

Figure 13. *Katie Holten: Learning to be Better Lovers*, June 8, 2025, a forest walk with Katie Holten on Vallisaari island, Helsinki. Photo: ©HAM/Helsinki Biennial/Henni Hyvärinen. Source: <https://www.katieholten.com/forest-thinking>

Figure 14. *Emke Idema: School of Unlived Worlds*. 2024. near Hornhuizen, Groningen. Image source: artist's website. <https://www.emkeidema.nl/en/school-of-unlived-worlds>

Figure 15. *Dominika Tihanyi (Újirány Group) & Tamás Tibor (Rév 8 Zrt.): Temporary 'rehabilitation office.'* 2008. Lumen Cafe, Budapest, Hungary. Photo: Dominika Tihanyi.

Source:

<https://epiteszforum.hu/kreativ-strategiak-es-a-kozteri-muveszet-szerepe-a-varosfejlesztesben>

Figure 16. *Dominika Tihanyi, Árpád Kovács, Dorottya Thurnay: Pollmap – The Interactive Mapping Project*. 2008. Budapest, Hungary. Photo: Dominika Tihanyi. Source:

<https://doi.org/10.7480/spool.2016.2.1393>

Figure 17. *Markus Jeschaunig: Oasis No.8*. 2016. Photo: Simon Oberhofer. Graz, Austria.

Source: <https://agencyinbiosphere.com/archives/project/oasis-no-8>

Figure 18. *Gram Art Project: Grow in India*. 2016. Paradsinga, India. Photo courtesy of the artists.

Figure 19. *Fuzzy Earth: Not Quite California Wonder*. 2021. Placcc 2021, Budapest, Hungary. Photo: Attila Balogh

Figure 20. *Katalin Kortmann, Bálint Katona & András Kaprinyák: Fireworks*. 2021. Placcc 2021, Budapest, Hungary. Photo: Attila Balogh

Figure 21. *Boglárka Jakabfi-Kovács: What You See. A Public Affair*. 2024. Placcc 2024, Budapest, Hungary. Photo: Attila Balogh

Figure 22. *Eva Bubla: Designated Breathing Zone 2.0*. 2023. Placcc 2023, Budapest, Hungary. Photo: Attila Balogh

Figure 23. *Eva Bubla: Designated Breathing Zone 3.0*. 2024. Placcc extra, Budapest, Hungary. Photo: Attila Balogh

Figure 24. *Eva Freund: Layers of Water*. 2024. Placcc 2024, Budapest, Hungary. Photo: Attila Balogh

Figure 25. *Anita Patonay & Viktor Bori: Water Level*. 2024. Placcc 2024, Budapest, Hungary. Photo: Attila Balogh

Figure 26. *SVUNG: No Endpoint*. 2021. Placcc 2021, Budapest, Hungary. Photo: Attila Balogh

Figure 27. *Viktória Kaslik: Dandelion Feast. A Protocol to Eliminate Legal Waste from Earth Bodies*. 2025. Placcc 2025, Budapest, Hungary. Photo: Attila Balogh

Figure 28. *Csilla Hódi, lutz&bog & Planty Warhol: Micro-cruising*. 2024. Placcc 2024, Budapest, Hungary. Photo: Attila Balogh

Figure 29. *MOME: Tolna Sound Garden*. 2023. Placcc 2023, Budapest, Hungary. Photo: Attila Balogh

Figure 30. *Jonas Staal: Interplanetary Species Society*. 2019. Reaktorhallen, Stockholm, Sweden. Photo: Ricard Estay. Source: <https://www.jonasstaal.nl/projects/interplanetary-species-society>

Figure 31. *Tamara Henderson: Worm Affair*. 2023. Helsinki Biennial 2025, Vallisaari Island. Photo: HAM / Helsinki Biennial / Sonja Hyytiäinen. Source: <https://helsinkibiennaali.fi/en/artist/tamara-henderson>

Figure 32. *Artist talk by Eva Bubla to introduce the project*. IN SITU Focus Seminar 2022. Østfold Internasjonale Teater, Fredrikstad, Norway. Photo: ØIT

Figure 33. *Eva Bubla: Resting with the Land*. 2023. Gudebergjordet, Fredrikstad, Norway. Photo courtesy of the artist

Figure 34. *Eva Bubla: Resting with the Land*. 2023. Gudebergjordet, Fredrikstad, Norway. Photo courtesy of the artist

Figure 35. *Eva Bubla: Resting with the Land*. 2023. Gudebergjordet, Fredrikstad, Norway. Photo: Ida Willassen

Figure 36. *Eva Bubla: Resting with the Land*. 2023. Gudebergjordet, Fredrikstad, Norway. Photo: Ida Willassen

Figure 37. *Eva Bubla: Resting with the Land*. 2023. Gudebergjordet, Fredrikstad, Norway. Photo: Ida Willassen

Figure 38. *LUIT: Manual of Adaptation to the Planet*. 2020. Photo: Loic Nys. Source: <https://en.luit.fr/manuel-dadaptation-a-la-planete>

Figure 39. *Climaginaires: Carbon Ruins*. 2019. Installation view, Lund University, Lund, Sweden. Photo: Håkan Røjder. Source: <https://www.climaginaires.org/carbon-ruins>

Figure 40. *Kitti Gosztola & Bence György Pálincás: Wild Garden Utopia. Buckminster Fuller-inspired geodesic dome structure and workshop*. 2019. Morning Boat, Jersey. Photo: Sári Ember. Source: <https://kittigosztola.com/wild-garden-utopia-II> and <https://en.palinkasbencegyorgy.hu/WildGarden.html>

Figure 41. *Eva Bubla: Microbial Futures Lab*. 2023. 1111 Gallery, Budapest, Hungary. Photo: Nyíri Julianna / MKE

Figure 42. *Eva Bubla: Microbial Futures Lab*. 2023. 1111 Gallery, Budapest, Hungary. Photo: Nyíri Julianna / MKE

Figure 43. *Eva Bubla: Microbial Futures Lab. SymbiFarm patient information leaflet.* 2023. 1111 Gallery, Budapest, Hungary. Photo: Nyíri Julianna / MKE

Figure 44. *Eva Bubla: Microbial Futures Lab. SymbiFarm.* 2023. 1111 Gallery, Budapest, Hungary. Photo: Nyíri Julianna / MKE

Figure 45. *Eva Bubla: Microbial Futures Lab. Soil bar.* 2024. BENU Pharmacy / Placcc 2024, Budapest, Hungary. Photo: Attila Balogh

Figure 46. *Eva Bubla: Microbial Futures Lab. SymbiFarm and Designated Breathing Zone household edition.* 2024. BENU Pharmacy / Placcc 2024, Budapest, Hungary. Photo: Attila Balogh

Figure 47. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop.* 2024. KAIR Residency, Kosice, Slovakia. Photo: Peter Michal

Figure 48. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop.* 2024. KAIR Residency, Kosice, Slovakia. Photo: Peter Michal

Figure 49. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop.* 2026. Lehetőségek tere / MKE, Budapest, Hungary. Photo: Viktor Kádár

Figure 50. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop.* 2026. Lehetőségek tere / MKE, Budapest, Hungary. Photo: Viktor Kádár

Figure 51. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop.* 2024. IN SITU Open Day 2024, Pelt, Belgium. Photo: Pedro Morato Gabao & Bryan Lassudry

Figure 52. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop.* 2024. IN SITU Open Day 2024, Pelt, Belgium. Photo: Pedro Morato Gabao & Bryan Lassudry

Figure 53. *Eva Bubla: Microbial Futures Lab.* 2024. BENU Pharmacy / Placcc 2024, Budapest, Hungary. Photo: Attila Balogh

Figure 54. *Eva Bubla: Microbial Futures Lab.* 2024. HAPUfest 2024, Pristina, Kosovo. Photo: Arben Llapashtica / Teatri ODA

Figure 55. *Eva Bubla: Microbial Futures Lab.* 2024. IN SITU Open Day 2024, Pelt, Belgium. Photo: Pedro Morato Gabao & Bryan Lassudry

Figure 56. *Eva Bubla: Microbial Futures Lab. Future Medicine workshop.* 2024. IN SITU Open Day 2024, Pelt, Belgium. Photo: Pedro Morato Gabao & Bryan Lassudry

Figure 57. *Eva Bubla: Microbial Futures Lab.* 2024. KAIR Residency, Kosice, Slovakia. Photo: Peter Michal

Figure 58. *Eva Bubla: Microbial Futures Lab*. 2024. KAIR Residency, Kosice, Slovakia.
Photo: Peter Michal

Figure 59. *Eva Bubla: Microbial Futures Lab. Planetary Healthcare Advisors*. 2025. Photo:
Lilli Lumera

Figure 60. *Microbial Childhood Collaboratory: Making Kin with Microbes*. 2025. Hippalot
Festival, Hämeenlinna – Tampere, Finland. Photo: Eva Bubla

Figure 61. *Microbial Childhood Collaboratory: Making Kin with Microbes*. 2025. Hippalot
Festival, Hämeenlinna – Tampere, Finland. Photo: Eva Bubla

Figure 62. *Microbial Childhood Collaboratory: Missing Kins poster campaign*. 2025.
Hippalot Festival, Hämeenlinna – Tampere, Finland. Photo: Eva Bubla

Figure 63. *Microbial Childhood Collaboratory: Missing Kins poster campaign*. 2025.
Hippalot Festival, Hämeenlinna – Tampere, Finland. Photo: Eva Bubla

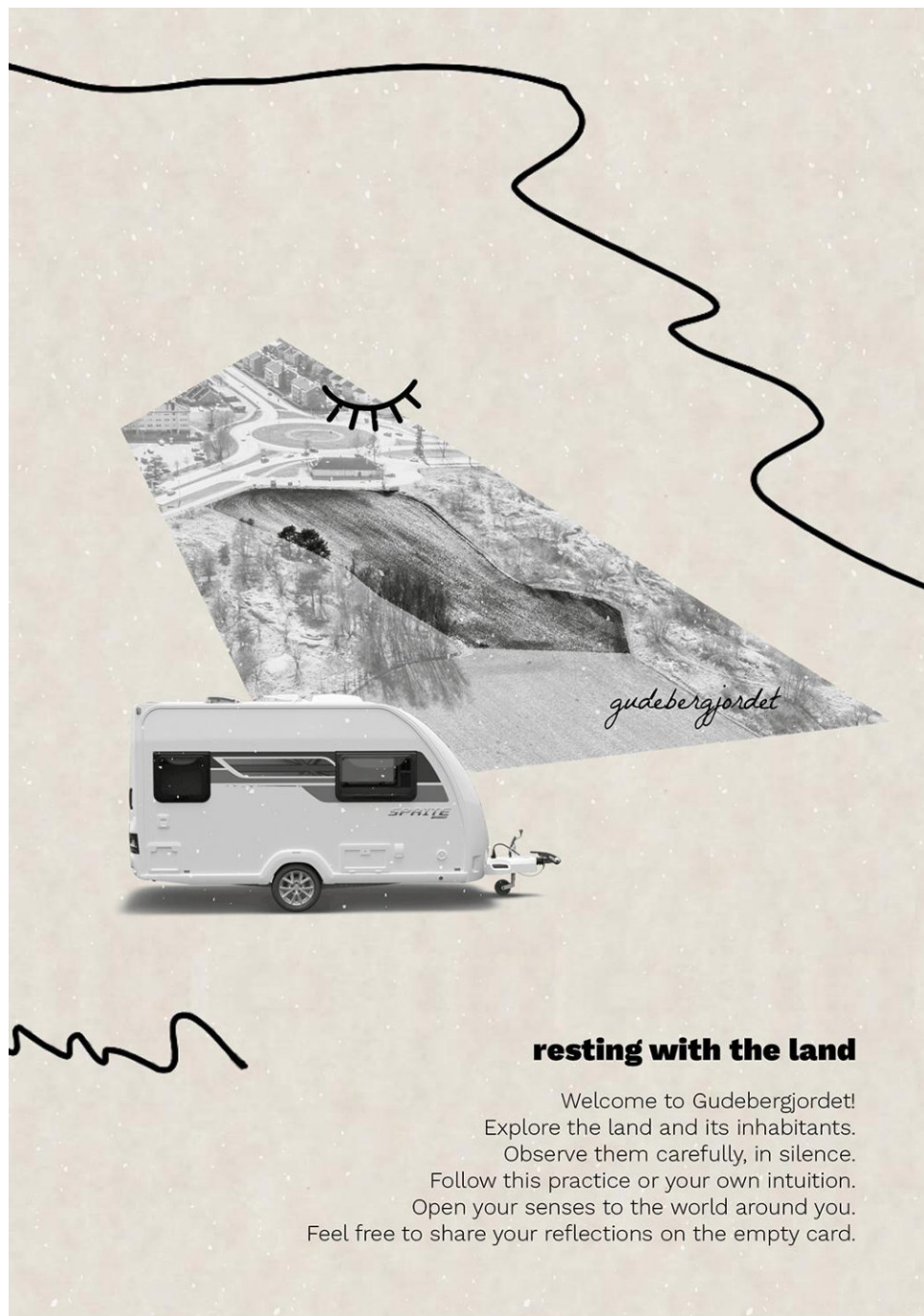
Figure 64. *Microbial Childhood Collaboratory: Missing Kins poster campaign*. 2025.
Hippalot Festival, Hämeenlinna – Tampere, Finland. Photo: Eva Bubla

Appendices

Appendix A. Resting with the Land interaction materials

The following pages present a selection of interaction cards designed to invite participants to engage with their surroundings from different perspectives. Alongside the original prompts, selected completed cards document how participants responded to these invitations during different iterations of the projects. Rather than serving as a systematic evaluation, these reflections offer traces of individual encounters and provide insight into the forms of attention and imagination that emerged through the participatory process.

Appendix A1. Interaction cards (front, English version), Resting with the Land, 2023. Designed by Eva Bubla.



resting with the land

Welcome to Gudebergjordet!
Explore the land and its inhabitants.
Observe them carefully, in silence.
Follow this practice or your own intuition.
Open your senses to the world around you.
Feel free to share your reflections on the empty card.

Appendix A2. Interaction cards (back—sixteen varieties, English version), Resting with the Land, 2023. Designed by Eva Bubla.

01. breathing

Take a deep breath.

Exhale slowly, releasing any tension in your body. Breathe through your nose, in your own rhythm. Imagine what enters or leaves your body by each breath you take.

Think of the organisms - the bacteria, algae and plants - that live in the ocean, in fresh water, and on land.

Acknowledge these non-human lifeforms who keep us humans alive by producing the oxygen we inhale and by cleaning the air from harmful pollutants.

Become aware of what you breathe in. As you exhale, become aware that you have used some of the air to maintain your own systems. With your next inhale, imagine the oxygen coming out of the bottom of the plants' leaves. As you breathe out, you release carbon dioxide back into the atmosphere, which is then used by plants for photosynthesis, for their own survival.

With each inhale, give thanks for clean air, and with each exhale, offer your breath to help plants grow. Notice this interaction and the thoughts and feelings it evokes in you.

Take one last deep breath and express gratitude to your plant collaborators.

evabubla.art
oit.no

02. land breathing

Listen to the sound of the land
breathing.

evabubla.art
oit.no

03. smellwalk

Take a deep breath and focus on the sensations that reach your nose. Observe each scent that passes you. Walk around and do not hesitate to get close to unusual surfaces, to touch plants, or to sneak into hidden places.

Notice what smells surround you as you walk.

Where do they come from, how intense are they, what area do they cover? What stories do they tell?

Describe the scent with an adjective, with personal qualities, characteristics.

Imagine how the scent affects the local landscape and its inhabitants.

What smells, scents are missing?

What would you leave as it is, what would you change? Why?

evabubla.art
oit.no

04. soil rites

Find an unpaved spot and
touch the soil below your feet.

Pay attention to the material you feel on your skin and rub your hands with it. Notice the invisible microbial diversity and the wellness of the community.

Dance with the multitudes of organisms that constitute the soil to boost your immune system.

Or stay still and wait till your hands decompose and nurture the land.

evabubla.art
oit.no

05. imitation

Observe the environment around you. Find an element in it that you look at closely.

What is its shape, movement, sound?

Start to imitate it, and notice the kind of sensations, thoughts that you come across.

evabubla.art
oit.no

06. camouflage

Camouflage yourself in the environment until you disappear.

How does it feel to be the living being you turned into?

evabubla.art
oit.no

07. substitute

Walk around to explore the area and identify what is missing there.

Once you have it, embody it.

evabubla.art
oit.no

08. tracing

Trace a footprint, an animal, a smell, or any element in the environment.

Where does it lead you?

evabubla.art
oit.no

09. cloudwatching

Look at the clouds floating.

Harvest some to cover your soil from direct sunlight.

It creates some fluffy mulch to plant into.

evabubla.art
oit.no

10. root with a tree

Find a tree that calls you. Lean your back on its trunk. Feel as its bark is touching you, as it holds you firmly.

Listen through your skin.

Follow the voices that travel through its roots, its mycorrhizal networks, transporting sugars and nutrients, cues and stories of generations of trees and fungi.

What do you hear?

evabubla.art
oit.no

11. rooting

Stand firmly, putting your weight on all corners of your feet. Feel as you ground yourself, as you grow roots deep down in the cool, moist soil.

Extend your attention to the complexity of your root system, penetrating the earth below you.

Feel its shape, thickness, flexibility, and the strength laying in it.

Find one of your root tips. Taste the wet soil; smell the decaying matter rich in nitrogen and phosphorus. Suck up nutrients and water, moving towards the source, pushing yourself up against the soil. Wherever you sense resistance, just release your chemical stores to dissolve whatever is in your path.

What do you encounter along this journey?

Based on Natasha Myers' *Sensing Botanical Sensoria:
A Kriya for Cultivating Your Inner Plant*

evabubla.art
oit.no

12. grasswatching

Sit still and watch the grass grow.

Let it grow through your skin, gently tickling you to the bones.

evabubla.art
oit.no

13. resting

Think of all the things you want to do.
Now dig a hole in the ground and place them there.

Rest.

Let them sprout as you are energized.

evabubla.art
oit.no

14. more than human perspectives

Get closer to one element in nature, and see it feelingly.

How do you perceive that element?
Feel its shape, form, texture, smell, sound.

Shift perspective.

How might it perceive you and the world around you?

Start a conversation.

evabubla.art
oit.no

15. photosynthesis

Find a patch of sunlight.
Stand firmly, letting your feet sink into the soil below you.

Feel as the sun warms your skin, entering into each cell of yours. Your arms dissolve into leaves, your spine turns into a stem.

You pump water and minerals through your veins, up your stem, into your leaves. You are nourished by moisture and the sunlight flowing through your body.

Enjoy the sunlight through your greening leaves. Feed yourself with the sugar your chloroplasts make.

Treat yourself with some carbon-dioxide while breathing in the air around you. Feel some cool air under the back of your leaves as you release atmospheric vapours. Return some oxygen to your environment.

Based on Natasha Myers' *Sensing Botanical Sensoria:
A Kriya for Cultivating Your Inner Plant*

evabubla.art
oit.no

16. memory of the future

Find a spot on the land that will be your place of observation. Inhabit it at dawn and dusk, mapping the passage of time through changing light conditions.

Extend your awareness on the parts of your body where the light of the rising and setting sun reaches you. Repeat the visits on different days, in different seasons.

What kind of sensations emerge?

Can you anticipate where the light will reach you next time? What does it tell you about time?

Let these experiences dance with you for the earth's rotational rhythms.

Based on Natasha Myers' *Sensing Botanical Sensoria:
A Kriya for Cultivating Your Inner Plant*

evabubla.art
oit.no

— your reflections

Share your thoughts, personal experiences, questions, or your own practice.
Del dine tanker, egne erfaringer, spørsmål, eller din egen praksis.

evabubla.art
oit.no

12 **your reflections**

I can hear it whispering in the wind. A silent choir singing to me the story of life.

Peacefully moving their little
bodies gently in the wind
Dancing and twirling around
each other, empowered by the
sunlight that stripes their
skin.

Carefully forming a communion
with each other, ready to support
one another.

Little Islands of families I can sense

Share your thoughts, personal experiences, questions, or your own practice.
Del dine tanker, egne erfaringer, spørsmål, eller din egen praksis.

The bary skin of our planet

evabubla.art
oit.no

___ your reflections

of the Bull somehow etched
smell/scent unfamiliar to
"read" the landscape
how much this
is a place
of another
tempus by
is a place of
movement
barbaric
by my founders
I am fond of this
vokes images of how a
fertility, fecundity. the image
turned into this soil
connoisseur of soils might
praise. yet I question
for this place. it
by activities
went all around
this
is a place of
movement
barbaric
by my founders
I am fond of this
vokes images of how a

Share your thoughts, personal experiences, questions, or your own practice.
Del dine tanker, egne erfaringer, spørsmål, eller din egen praksis

evaclub.art
oit.no

Share your thoughts, personal experiences, questions, or your own practice.
 Del dine tanker, egne erfaringer, spørsmål, eller din egen praksis

Del dine tanker, egne erfaringer, spørsmål, eller din egen praksis

evabubla.art
oit.no

___ your reflections

To me, Earth is a beautiful element. It comes in different colors and forms, but is somehow all from the same roots. Most noises come from other elements, but they ~~wouldn't~~ wouldn't be around us to make those noises without the earth. But the earth can make noise, like shifting plates. The earth might see me in many ways. The earth below me might see me as a giant who can walk on them, but the earth above me, like trees, might see me as someone to watch over, like an

Share your thoughts, personal experiences, questions, or your own practice.
Del dine tanker, egne erfaringer, spørsmål, eller din egen praksis.

Del dine tanker, egne erfaringer, spørsmål, eller din egen praksis.

entertainment.

evabubla.art
oit.no

___ your reflections

Well, it feels quite good
to like hide from the
outside world, and just
like stay in peace
without any disturbance.
It is also very quite
and just the nature
speaking, and the small
creatures.

Share your thoughts, personal experiences, questions, or your own practice

Del dine tanker, egne erfaringer, spørsmål, eller din egen praksis

evabubla.art
oit.nc

— your reflections

follow the noise cars think of my
desires under mold safely hidden
Breathing is possible more slowness
like an everyday ritual becomes
more like a practice the
practice turns into everyday
ritual a mantra a prayer
a piece of a verse of a song
my song my own voice
sharing the wind air breath
willingly where do I begin and
this around me begin where do
we meet or are we one
I feel alone when invited into

Share your thoughts, personal experiences, questions, or your own practice.
Del dine tanker, egne erfaringer, spørsmål, eller din egen praksis.

evabubla.art
oit.no

silence should like the world
at present to be more silent
like leaving the silly desk
with the computers getting
wet and moldy let it become
an overgrown workspace without
other purpose than being
fluffy and green hidden
under a tree or a huge
really surrealistic mushroom
I draw labyrinthical inner
spaces with wooden sticks
and small artifacts to create
small inner landscapes
as if to control all that
is part of it delicate
smooth beautiful personal

— your reflections

I saw a dead tree.
Dead. Not killed.
Deceased. Not diseased.
My life filled hands.
Offered nothing but reminders
that once which is dead
Remains dead.
But, how shall it survive
Beyond its time in the sun?
Did it perish from too
Much fun?
I see. I smell. I breathe.
For it can't.

Share your thoughts, personal experiences, questions, or your own practice.
Del dine tanker, egne erfaringer, spørsmål, eller din egen praksis.

evabubla.art
oit.no

Is a tree ever young/old?
A sapling perhaps is young, but
it is an inconsequential period
in the grand life span of
the life of a tree.

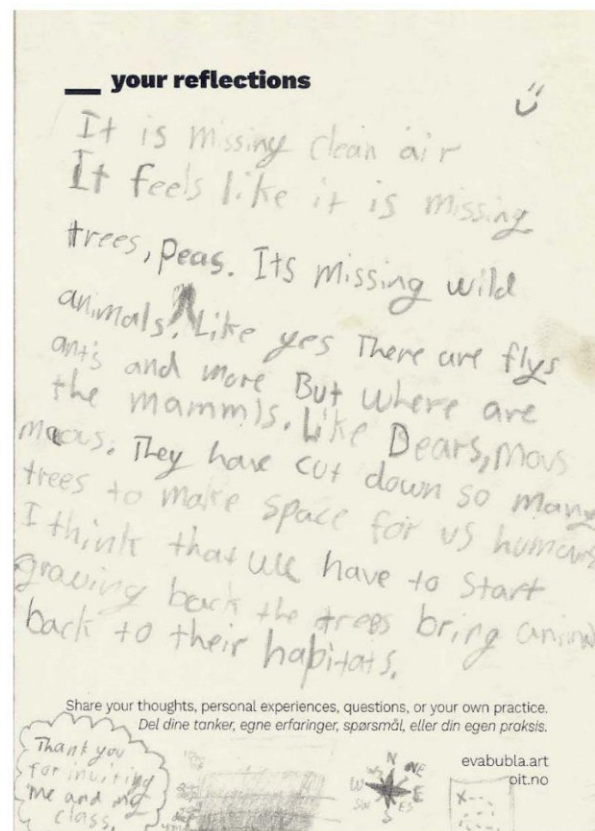
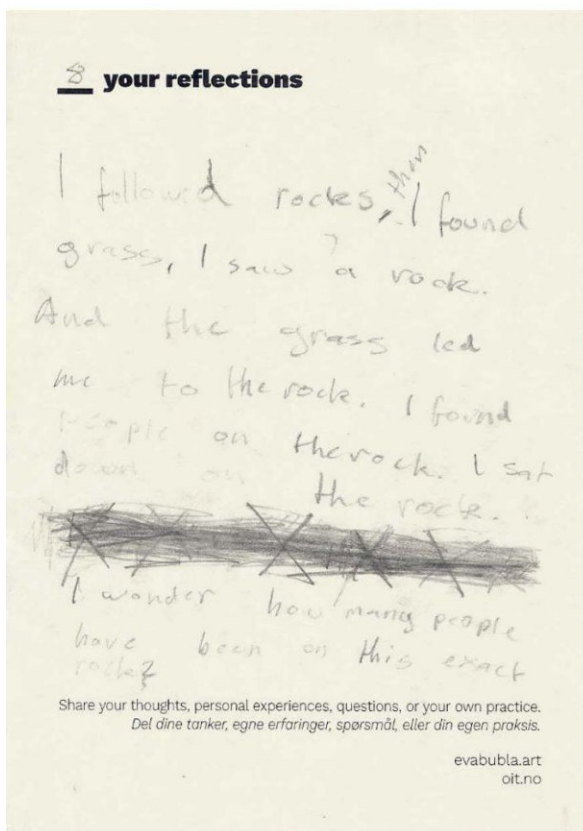
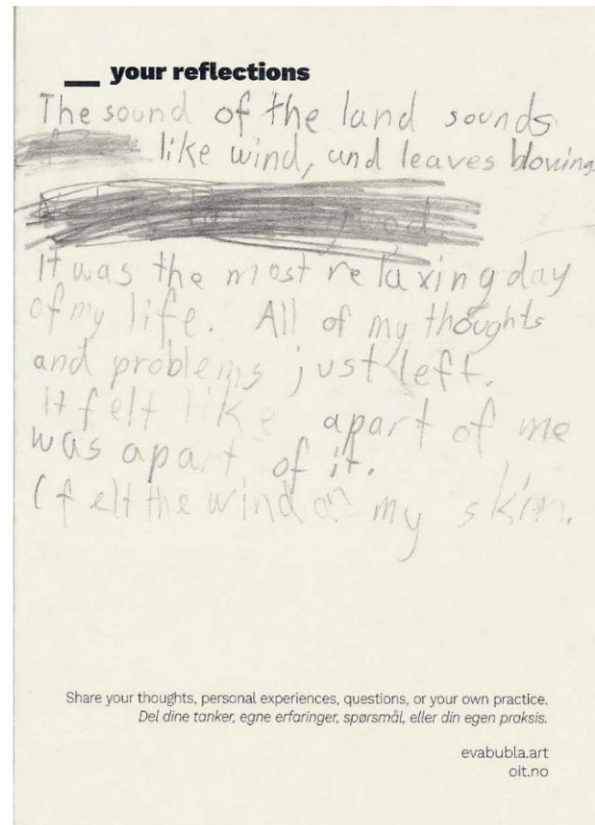
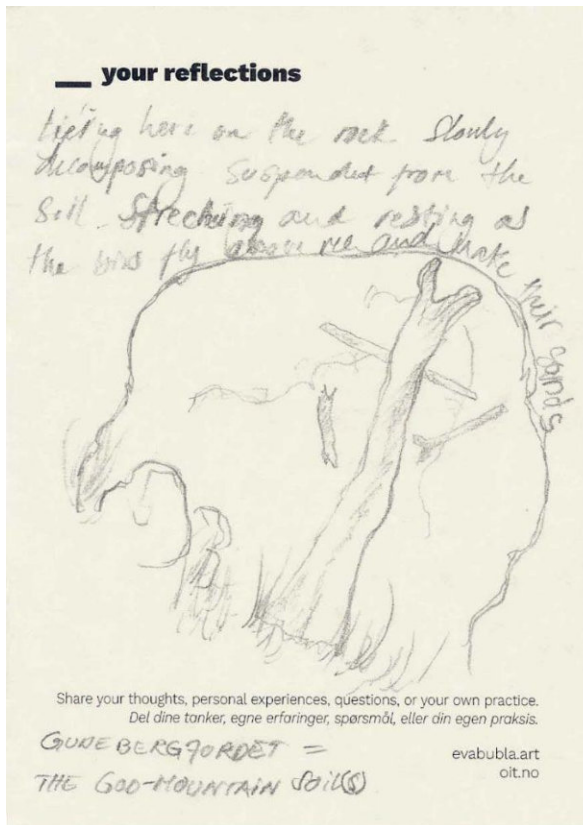
What does it mean to be
young?

↳ vulnerable, uncertain,
weak?

And, what intern does it
mean to be old?

↳ strong, certain, wise?

Could this paper be considered
a dead tree?



Appendix A5. Question cards, Resting with the Land, 2023. Designed by Eva Bubla.

The following question cards were developed as a facilitation tool to support the participatory conversations and provide possible starting points in case dialogue needed prompting. They were not intended as a fixed structure or questionnaire. In practice, the conversations unfolded more organically than anticipated, shaped by participants' experiences, interests, and responses to one another. The cards therefore remained mostly in the background; nevertheless, many of the questions they contained emerged naturally over the course of the discussions.



**What is the first word that comes to
your mind when you hear the word
“garden” or “farm”?**

*Hva er det første ordet du tenker på når du hører
«hage» eller «gård»?*

evabubla.art
oit.no

**Is it important to have
farms in the city? Why?**

Er det viktig å ha gårdsbruk i byer? Hvorfor?

evabubla.art
oit.no

Where do you get your food from?

Hvor skaffer du maten din?

evabubla.art
oit.no

**Have you tried
growing your own food?
What were your experiences?**

*Har du forsøkt å dyrke din egen mat?
Hva var erfaringen din?*

evabubla.art
oit.no

**What would you eat if
the borders of Norway closed?**

*Hva ville du spist dersom alle Norges grenser ble
stengt?*

evabubla.art
oit.no

**What kind of stories, memories do you
have about Gudebergjordanet?**

*Hvilke minner og historier ha du
fra / om Gudebergjordanet?*

evabubla.art
oit.no

**What would Gudebergjordanet tell us
if it could speak?**

*Hva tror du Gudebergjordanet ville fortelle oss om
det kunne snakke?*

evabubla.art
oit.no

**How do you see Gudebergjordanet
in 20 years?**

*Hvordan ser du for deg Gudebergjordanet
om 20 år?*

evabubla.art
oit.no

Appendix B. Microbial Futures Lab: Future Medicine workshop materials

Appendix B1. Patient information leaflet template used in the Future Medicine workshop (English and Hungarian version), Microbial Futures Lab, 2023-ongoing. Designed by Eva Bubla.

PATIENT INFORMATION LEAFLET		
Read this leaflet carefully before you start using this medicine or treatment because it contains important information for you. - Keep this leaflet. - Ask your healthcare professional - a doctor, an elder, a healer or a pharmacist - and attune to your microbiome if you need more information or advice. You must get in contact with a professional if your symptoms worsen or do not improve, or if you get any side effects not listed in this leaflet.	Children and adolescents Other medicines and treatments Please inform your healthcare professional about any past, current or future use of other medicines, including ones obtained without a prescription.	
IN THIS LEAFLET - What this medicine or treatment is for - Before you take the medicine or start the treatment - How to take the medicine or apply the treatment - Possible side effects - Storing the medicine - Further information 1. WHAT THIS MEDICINE OR TREATMENT IS FOR	The medicine with food, drink, alcohol Pregnancy and breastfeeding Driving and using machines	
2. BEFORE YOU TAKE THE MEDICINE OR START THE TREATMENT No need to take the medicine or start the treatment if	3. HOW TO TAKE THE MEDICINE OR APPLY THE TREATMENT	
Warnings and precautions	If you take more medicine or overuse the treatment	
Take special care with the medicine or treatment if	If you forgot to take the medicine or apply the treatment	
4. POSSIBLE SIDE EFFECTS Very common: may affect more than 1 in 10 users Common: may affect up to 1 in 10 users Uncommon: may affect up to 1 in 100 users Rare: may affect up to 1 in 1,000 users Very rare or not known: may affect less than 1 in 10,000 users or frequency cannot be estimated from the available data Reporting of side effects If you get any side effects, talk to your healthcare professional and help provide more information on the potential of this medicine. This includes any possible side effects not listed in this leaflet. 5. STORING THE MEDICINE		6. CONTENTS OF THE PACK AND FURTHER INFORMATION What the medicine contains Active ingredient: Further ingredients: Packaging Research License Holders Manufacturer This leaflet was last revised in .../...



BETEGTÁJÉKOZTATÓ: INFORMÁCIÓK A FELHASZNÁLÓ SZÁMÁRA

Mielőtt elkezd alkalmazni ezt a gyógyszerkészítményt vagy kezelést, olvassa el figyelmesen az alábbi betegájékoztatót, mert az Ön számára fontos információkat tartalmaz.

- Tartsa meg a betegájékoztatót.
- További információért forduljon egészségügyi szakemberhez - kezelőorvosához, gyógyszerészehez, gyógyszerjához vagy közössége időseihez -, és hangolódjon a mikrobiomjára. Forduljon szakemberhez, ha tünetei súlyosbodnak vagy nem javulnak, illetve ha olyan mellékhatások jelentkeznek, amelyek nem szerepelnek ebben a betegájékoztatóban.

A BETEGTÁJÉKOZTATÓ TARTALMA

1. Milyen típusú gyógyszer vagy kezelés, és milyen betegségek esetén alkalmazható?

2. Tudnivalók a készítmény vagy kezelés alkalmazása előtt

3. Hogyan kell alkalmazni a készítményt vagy a kezelést?

4. Lehetséges mellékhatások

5. Hogyan kell a készítményt tárolni?

6. A csomagolás tartalma és egyéb információk

1. Milyen típusú GYÓGYSZER VAGY KEZELÉS, ÉS Milyen BETEGSÉGEK ESETÉN ALKALMAZHATÓ?

2. TUDNIVALÓK A KÉSZÍTMÉNY VAGY KEZELÉS ALKALMAZÁSA ELŐTT

Nem szükséges az alkalmazása

- Ha

Figyelmeztetések és óvintézkedések

Fordítson különös figyelmet a gyógyszerkészítmény szedésére vagy a gyógyszerkezelés alkalmazására

- Ha

Terhesség, szoptatás, termékenység

Gyermekek és serdülők

Egyéb gyógyszerek és gyógyszerkezelések

Feltétlenül tájékoztassa egészségügyi szakemberét jelenleg vagy nemrégiben szedett, valamint szedni tervezett egyéb gyógyszereiről, valamint kezeléseiről, beleértve a vérnyomást kaphatókat és igényelhetőket is.

Különböző ételek, italok és szerek hatása a készítményre vagy kezelésre

A készítmény vagy gyógyszerkezelés hatása a gépjárművezetésre és a gépek kezeléséhez szükséges képességekre

3. HOGYAN KELL ALKALMAZNI A KÉSZÍTMÉNYT VAGY KEZELÉST?

Ha az előírtnál több készítményt vett be vagy több kezelést vett igénybe

Ha elfelejtette bevenni készítményt vagy alkalmazni a kezelést

4. LEHETSÉGES MELLÉKHATÁSOK

Nagyon gyakori:
10 betegből várhatóan több, mint 1 tapasztalja

Gyakori:
100 betegből várhatóan legalább 1, de legfeljebb 10 tapasztalja

Nem gyakori:
1000 betegből várhatóan legalább 1, de legfeljebb 10 tapasztalja

Ritka:
10.000 betegből várhatóan legalább 1, de legfeljebb 10 tapasztalja

Nagyon ritka vagy nem ismert:
10.000 betegből kevesebb mint 1 tapasztalja, vagy a rendelkezésre álló adatok alapján nem állítható meg

Mellékhatások bejelentése
Ha Önnek bármilyen mellékhatás jelentkezik, tájékoztassa egészségügyi szakemberét, és hozzájárulhat ahhoz, hogy minél több információ álljon rendelkezésre a gyógyszerben rejlő lehetőségekről. Ez a betegájékoztatóban fel nem sorolt bármilyen lehetséges mellékhatásra is vonatkozik.

5. HOGYAN KELL A KÉSZÍTMÉNYT TÁROLNI?

6. A CSOMAGOLÁS TARTALMA ÉS EGYÉB INFORMÁCIÓK

Mit tartalmaz a készítmény?
A készítmény hatóanyaga:

Egyéb összetevők:

Csomagolás:

A forgalomba hozatali engedély jogosultja

Gyártó

A betegájékoztató legutóbbi felülvizsgálatának dátuma:/...../.....

MICROBIAL FUTURES LAB

MEDICAL PRESCRIPTION

PATIENT NAME:
AGE:
GENDER:
DRUG ALLERGIES:
INSURANCE NUMBER:

DATE:

Rx

CLINICAL DESCRIPTION:

TREATMENT:

SIGNATURE

MICROBIAL FUTURES LAB ORVOSI VÉNYE											
Az orvos adatai:											
Beteg neve, címe:						Születési dátum:					
						ENY:					
EU:											
Varázslatkezeléskor azonosító (IA) száma:				INC#:		Külföldi dátuma:				Nem bevetett albi	
Jogcímkék:		Non- mativ	Fényes tápl.	HMA	Köz- priorit	Ünemi határ	EL- szórakoz	EL- szórakoz	EL- szórakoz	Tervez P.	
Szakorvosi javaslatokra vonatkozó adatok:			Különböző orvos azonosítói:			Javaslat kiállításának dátuma:			Betegállapotú személy neve/címe:		
Rp.											
P.H. beteg aláírása termék átvevőjének aláírása orvos aláírása											
Kiadás dátuma: A termék kiadójának bélyege: A retaxát végző bélyege:											

Extra vonalkód:

The following selection presents examples of medical prescriptions developed by participants during the Future Medicine workshop. They are included to illustrate the range of patients, diagnoses, speculative responses, and future imaginaries that emerged through the participatory process.

[illegible]

