Universitat Autònoma de Barcelona

(Re)searching for Transformations: Collective Nurturing of Knowledge for Environmental Justice

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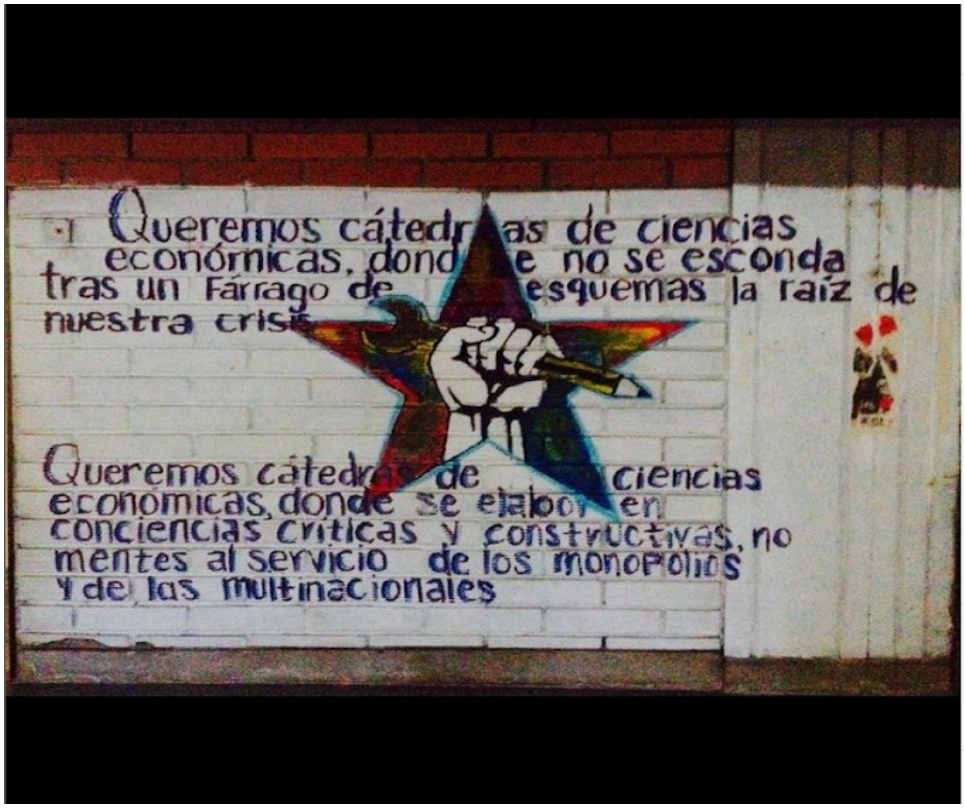

(Photo of graffiti on a wall at the University of Medellin, Colombia, 2018. Photo credit Lena Weber.)

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A thesis submitted in fulfillment of the requirements for the degree of PhD programme in Environmental Science and Technology (Ecological Economics and Environmental Management) in the Institut de Ciència i Tecnologia Ambientals (ICTA)

ICTA Institute of Environmental Science and Technology - UAB

UAB Universitat Autònoma de Barcelona

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"Queremos cátedras de ciencias económicas, donde no se esconda tras un fárrago de esquemas la raíz de nuestra crisis. Queremos cátedras de ciencias económicas, donde se elaboren conciencias críticas y constructivas, no mentes al servicio de los monopolios y de las multinacionales"

-Grafiti pintado por una pared en la Universidad de Medellín, Colombia (2018)

[In academic settings and this program] I can feel very distraught, [I feel] distant from a lot of where I feel like I came from. And that can feel very lonely and very disheartening and sad and makes me feel angry because it shouldn't be this gap. […] Sometimes [in class] it's so frustrating feeling like we aren't talking about anything real, like everything is up in the air and philosophical but we're talking about these really intense, heartbreaking topics but in this really abstract way….And then sometimes it feels like the most important thing.

-Masters student in Human Ecology, Lund University, interview (2015)

"Cuando escribimos hacemos transformaciones sociales. Que tenemos mucho poder para aportar al país o llevarlo a la tierra. De tolerar y ser cómplices de grupos de poder o presentar la información tal como es, en el caso de los territorios, que están despojando a la población de sus propias tierras y de los recursos naturales."

-Investigative Journalist in Honduras, interview (2018)

ABSTRACT

Critical, transformative approaches to research aim to transgress the failing structures of mainstream science and academia in order to more effectively address today's pressing socio-ecological issues. They aim to be transformative through process as well as results, prioritizing issues of social and environmental justice. These critical approaches see academic theory and political practice as inherently intertwined, and position their practitioners as activist-academics fighting to create a more socially and environmentally just world. Due to mainstream science's contribution to the current socio-ecological crisis, and the pressing need for strong, transformations-oriented alternatives, it is strategic and pressing to focus on strengthening our transformative research work.

This thesis contributes to collaborative knowledge theory and methodology for transformative research. It aims to act as a pedagogical thesis- operating from a place of praxis for change-making. To do so it dives into communities of academic and non-academic researchers across the globe to learn from their experiences working to transform diverse socio-ecological issues. Combining wisdom from our scholarly elders with insights from young boundary-crossing activist researchers nurturing alternative-building and navigating repression on the frontlines of environmental conflicts, the thesis weaves together lessons learnt, obstacles, and opportunities from almost every continent. It concurrently offers examples of how these experiences can be translated into pedagogical activities and research methods for the next generation of researchers resisting and creating on a dying planet.

The main contribution of this thesis is the conceptualization of a transdisciplinary methodology that can be used to further transformative research goals, called Collective Nurturing of Knowledge for Environmental Justice, in response to the identified need for innovative, critical methodologies for Transformative Science. This methodology departs from a visionary, relational axiology guided by environmental justice goals. As the insights it offers come from ecological

economists, environmental justice scholars, conflict transformation practitioners, critical environmental education specialists, among others, the methodology has a great deal to offer transdisciplinary, environmental justice-oriented research in general.

The thesis also identifies key challenges of this type of research, outlines key principles for the political peer review process, deepens our understanding of the concept of political rigor, elucidates how transformations researchers navigate relationships in order to counter remoteness, and shows how funders and institutions can better support CKEJ and research for transformations. Finally, it applies aspects of the Alternatives Transformation Format to examine the current standing of CKEJ as a true alternative methodology, and to identify avenues for improvement and future research needs.

Gratitude

There are so many people and places that have inspired me, collaborated with me, and supported me along this journey. Barcelona, the ACKnowl-EJ network family, in particular Leah Temper for her guidance and support as my mentor and director, the ENVJustice project, the broader Transformative Knowledge Network community, the wonderful souls from the Environmental Learning Research Centre, the Living Aulas crew, all my co-conspirers in researching and writing, the Lund Human Ecology program for providing my foundation and then welcoming me back, and for all the other activists and radical alternative-builders encountered along the way….

In particular, I want to express gratitude for the love and support during these years from my family and friends: Brototi, Camila, and Lara - my Barcelona constants, Anna and family for being my second family, Dyl for their joy, encouragement and inspiration, my Mexico City crew-Yasmin, Madlyn and Fernando- for distracting me when I most needed it, and my sweet love and wife, Mykel, for seeing me through to the end.

Finally, an immense gratitude for the ways the Earth held me up, kept me nourished, moved me forward, and allowed me to rest.

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Acronyms

ACKnowl-EJ: Activist-Academic Co-Production of Knowledge for Environmental Justice
CKEJ: Co-Production of Knowledge for Environmental Justice, or Collective Nurturing of Knowledge for Environmental Justice
EJAtlas: Environmental Justice Atlas
ISSC: International Social Science Council
PNS: Post-Normal Science
SEE: Social Ecological Economics
TKN: Transformative Knowledge Network

PREFACE[1]

A. The Pluriversity for stuck humxns

One day you wake, roll out of bed,
a groan, a shake, turn of the head.

The sun seems changed- though that can't be

-it's all arranged for half past three.
Another meeting, then a test
- someday, you swear, you'll need to rest.

Most days your soul feels far away
-your chest, crushed - the future, gray.

Today, you think, will be the same -
screens and walls, no hope for change.

So, one by one, you shuffle your feet
into the morning's unseasonable heat.

1 Within the preface, the poem was originally written by me and published as a tiny book during the Living Aulas alternative research school in Colombia, 2018, and then was included, with edits from co-authors, as the beginning of our chapter in The Pluriversity for Stuck Humxns: A Queer EcoPedagogy & Decolonial School, in Springer Nature Switzerland AG 2021, J. Russell (ed.), Queer Ecopedagogies, International Explorations in Outdoor and Environmental Education 8, https://doi.org/10.1007/978-3-030-65368-2_10#DOI.

Co-authors of this chapter were Dylan McGarry, Lena Weber, Anna James, Injairu Kulundu-Bolus, Taryn Pereira, Shruti Ajit, Leah Temper, Thomas Kloster-Jensen Macintyre, Tania Villarreal, Susanne C. Moser, Rebecca Shelton, Martha Cecilia Chaves Villegas, Kuany Kiir Kuany, Jessica Cockburn, Luke Metelerkamp, Shrishtee Bajpai, Stefan Bengtsson, Saskia Vermeylen, Heila Lotz-Sisitka, Ethemcan Turhan, and Tshego Khutsoane.

The second part of the preface is based on a blog entry I wrote that was originally published on the Transformative Knowledge Networks website in 2017. The original version can be accessed here: https://transformationstosustainability.org/magazine/taking-transformation-seriously-dreams-speculations-alternative-building-academia/

Then upon reaching the university stairs -
you pause again to smell the air.

How strange,
what normally smells stale and old -
today gives whiffs of stories untold.

And before you can reach up to knock
the door is opened by grandfather clock:

"My post has changed, my ticking stopped-
no need for keys, now nothing's locked…

"Come in, come in there's much to see
your payments late? But school's now free!"

You cross the threshold - hands clenched tight -
what's going on? this can't be right…

The hall: a garden - the offices: gone…
and now… what's this? a sense that you belong?

You see beneath a poplar tree
gathered groups of twos and threes…

A waving flag above them spells
'Welcome to the Department of Raising Hell'…

And there-a herd of cows "moo" in,
through the Department of the More-Than-Human.

Off to learn the art of dilemnic farting
In the department of Transgressive Gardening

And over there-by the hedge
'the Department of Sticky Privilege'

Where students wash off their entitlement,
that sticky grime from colonial 'enlightenment'.

What appears to be a walking gut
calls "don't be shy, step right up!"

And gently moving to your side
says "welcome home, I'll be your guide".

You begin to walk as the gut gestures
"things are changing, rest assured" -

And just then you see,
a quite uncanny similarity

between a giant moss covered-rock,
and that handsy prof who always just 'wanted to talk'

"Over here!" the gut whispers, in your ear
"presentations have begun, we must go near" ...

"In the Department of Uncertainty
we both accept and critique -
the uncertainty in our work and world"
said the department's feet

"To recognize our inner wisdom
in the Department of Intuition
we learn to trust our instincts
to bring our desires to fruition…

Here we learn from error,
in the Department of Meaningful Mistakes-
we set aside our egos
to give more than which we take.

World-shaping is what we do
in the Department of Careful Crafting,
with threads of old we weave the new
remembering our grandmothers' darning.

Together we are powerful,
our differences make us strong-
'Coalescing of the Marginalized'
is where we all belong.

Realizing we cannot live in a bubble
in the Department of Empathetic Echolocation
We stay with the hot stinky trouble.
Practicing "call and response" education.

Appropriate strategically,
but don't become their fool-
these are the tactics we discuss
in Department of the Master's Tools"

And now we draw to a close
at least for today,
why yes, it is quite early,
but we all need time to play -

And to live other parts of life,
spend time with our loved-ones,
but worry not, my dearest peers,
the Pluriversity has just begun!"

If you find yourself lost in the struggle,
With all those things you carefully juggle,
Embody the tenaciously gifted cockroach,
Who is our ultimate queer survival coach...

...And now, kind reader, we end these rhymes-
with an invitation during these hard times-
full of yearning, for you, yes you, to join us in our quest
to shape the future of learning, no less!

B. On Taking Transformations Seriously

In *Rewriting the future*[2] Walidah Imarisha says that when she tells people she's a prison abolitionist, they look at her as though she "rode in on a unicorn sliding down a rainbow." Envisioning a future without prisons is indeed a radical vision, but, Imarisha argues, those are exactly the visions we need to be having. She and 'visionary movement strategist' adrienne maree-brown[3] co-edited an anthology entitled *Octavia's Brood: Science Fiction Stories from Social Justice Movements*[4], where they gather stories to collectively dream up a better future. Because, as they argue, organizing is science fiction. We dream the impossible, 'mining the past' for examples along the way, in order to build alternative ways of being.

Imarisha and maree-brown link into a wider international web of writers, artists and activists that use magical realism, fantasy, and sci-fi (or, as new climate change-related sci-fi is called, 'cli-fi') as a tool for transformation. In contrast to more 'mainstream' science-fiction, this writing, including sub-genres like afrofuturism and queer speculative fiction, centers voices and identities often absent in the utopic/dystopic/space-society stories we often see on TV or in the bookstores. And the transformative potential of these radical imaginings cannot be underestimated. After all, if technological inventions are often inspired by science-fiction stories their inventors read growing up[5], shouldn't we assume that our change-makers, activists, and community organizers can also invent, recreate, or defend ways of being and interacting that defy current hegemonic structures based on visionary stories? And what about academic researchers? How visionary can we be, and how can we contribute to radical alternative-building?

At the start of my PhD journey, I represented the Activist-Academic Co-Produced Knowledge for Environmental Justice – ACKNOWL-EJ network at our sister project T-LEARNING's summer research school in Visby, Sweden. Participants included T-Learning's international community of researchers and a member of the third

2 https://www.bitchmedia.org/article/rewriting-the-future-prison-abolition-science-fiction
3 adrienne maree-brown as well as queer theoriest fairn herising (cited later on in this thesis) both purposefully leave their names uncapitalized.
4 http://octaviasbrood.com/
5 http://www.smithsonianmag.com/science-nature/ten-inventions-inspired-by-science-fiction-128080674/

Transformative Knowledge Network project, PATHWAYS to Sustainability. ACKnowl-EJ, T-Learning and PATHWAYS were the three pilot projects of the Transformations to Sustainability (T2S) program funded by the International Social Science Council.[6] While each of our three projects were different in many ways, commonalities included a strong belief in the need for radical transformations of current dominant structures and systems in times of climate change, a willingness to dream big, and a thirst to use our research as a transformative tool in and of itself, even (especially) if these utopic visionings of research's potential draw scoffs from the mainstream.

I use the term 'critical transformations researchers' as an umbrella term for researchers who, whether affiliated primarily to academic institutions or to activist organizations/movements, or both, or neither, aim to transform the toxic structures and systems at the root of the current socio-ecological crisis through their research processes and outcomes. These researchers reject mainstream discourses that frame climate change and environmental destruction as isolated problems and move beyond mainstream sustainability discourses. Instead, they turn to existing and emergent critical theoretical works, practice and activist movements that identify and challenge the underlying structures we must transgress and transform to create real change (e.g. Plumwood 2002, Di Chiro 2008, Harvey 1996, Correa Bernier n.d., Walia 2014, Appadurai 2014, Schlosberg 2007, Klien 2014, Hornborg 2001, Weber & Hermanson, 2015). A part of this is the recognition of the need to transgress and transform dominant forms of knowledge 'production' and transcend the limitations and failures of mainstream scientific paradigms.

Instead of just studying, observing, and reporting, these researchers work to both understand and aid transformations through their nurturing of knowledge. Throughout my days together with other members of the Transformative Knowledge Networks in Visby, Sweden, we spoke about the critical methodologies and theories used by TKN project members, which seem to respond to Imarisha's call for visionary future-building. Counter-hegemonic cartographer Million Belay, for example, described working with

6 In 2014 the International Social Science Council launched the Transformations to Sustainability (T2S) programme, which was piloted as a way to put social scientists in leadership positions for global, inter- and transdisciplinary environmental change and sustainability research

communities across East Africa to map out the past, present, *and* future from their own perspectives, while I shared the scenario-building and backcasting method used by ACKnowl-EJ partners in Turkey in collaboration with an activist group resisting the construction of coal power plants and other ecologically destructive activities in their region. Other members stressed the centrality of conducting participatory, collaborative research to their vision of collective, transformative knowledge-building and sharing. As a new PhD student who often felt lost and hopeless about conducting academic research, I was inspired to meet so many researchers dedicated to norm-breaking and envisioning and building radically different forms of academia.

Perhaps what was most inspiring to me throughout the T-Learning research school at the start of my PhD journey was the energy poured into alternative-building every step of the way, including the very organization of the school itself. In defiance of the norms for typical academic conferences and meetings, the school's organizers invited us into ways of being and interacting that speak to the very transformations they see as necessary in the wider world. These included an initial silent walk and reflection led by Martha Chaves to acknowledge and invite the other (nature, spirits, the non-human) into our gathering and ask permission for our presence in a different territory from our own, incredibly creative and engaging sessions to share research methodologies and research updates, a (literally) glass-breaking group dance energizer, and collective strategic analysis of case study research using a variety of media.

Our first evening together, T-Learning coordinator Professor Heila Lotz-Sisikta stressed the *seriousness* of the project's work, the need to take advantage of the short, precious time the T-Learning project members could all gather together in order to engage in deep, important and fruitful discussions around their research. And yet, while in typical academic research conferences the term *seriousness* might manifest as something very different (often reinforcing harmful dominant structures around what is considered 'professional', 'respectable', and academic, and what isn't), in this space it opened up room for creativity and reflection in a unique way. I left the school understanding that these networks of researchers take transformation very seriously, and that includes taking

transgression, creativity, and *alternative ways of interacting, learning, and sharing* seriously.

And so I returned home almost feeling as though I had just lived through one of the stories Walidah Imarisha writes about: a beautiful piece of magical realism and speculative fiction on academia and research for, and with, transformation. The 'unicorn-rainbow' glances we received from others we came into contact with, as though they couldn't quite believe what they were seeing or overhearing, opened the door for rich discussions and exchanges on who we were, why we were doing what we were doing, and how serious we were about it. I don't think I am alone in feeling that this reminder on how to dream big and build as we go left me with a renewed energy and guiding vision for what transformative and transgressive academic research can look like. As Imarisha paraphrases Arundhati Roy in saying, "other worlds are not only possible, but are on their way—and we can already hear them breathing." As researchers, we can ask ourselves: are we just listening to their breathing? Or are we helping to pump fresh air into their lungs?

This thesis is another step on a journey to understand how we, as researchers, can 'pump fresh air' into the lungs of worlds worthy of our longing.

All The Flying Things/Wake Up Before It's Too Late. Commentary on Climate Change. Analog Collage, 2021. Lena Weber.

1. INTRODUCTION

We urgently need a paradigm shift. Extreme hurricanes, flooding, drought, snowfall, and other 'once in a lifetime' weather events take place with recurring frequency, making it increasingly hard for even the most privileged classes to ignore climate change. Climate-related disasters have increased by 80% over the past twenty years.[7] Environmental justice conflicts are reaching levels of violence previously unheard of or unrecorded– each year offers a new, wrenching record for the number of environmental and land defenders killed[8] in the interest of greed and capitalist profit. As I write this, gas prices around the world have skyrocketed due to Russia's recent invasion of Ukraine and the subsequent changes to global trade patterns, with longstanding anti-fossil fuel activists suddenly spotlighted in front of larger audiences than perhaps ever before. This is the 'fast', attention-grabbing violence of climate change and environmental injustice, but we must not ignore the horrific slow violence of gradual environmental degradation and pollution, either (Nixon 2011, Pain & Cahill 2022).

Amongst these complex, interlocked global and local landscapes, it is also becoming increasingly hard to ignore mainstream science´s failure to address these crises (Saltelli and Funtowicz 2017) and the contribution to their (re)entrenchment (Haller 2020, Spash 2021).

For researchers motivated to transform the realities around them, there is a need to transgress these failing structures of dominant forms of science (Lotz-Sisikta et al. 2015, Temper et al. 2019), including employing increased transdisciplinarity and Post-Normal and justice-oriented approaches to transcend these limitations (Saltelli & Funtowicz, 2017). An anti-hegemonic approach to the nurturing of knowledge must seek to be transformative through process as well as results.

Transformations as a term has largely grown from the intersection of sustainability

7 https://e360.yale.edu/digest/extreme-weather-events-have-increased-significantly-in-the-last-20-years
8 See, for example, Global Witness' annual reports over the past seven years https://www.globalwitness.org/en/about-us/global-witness-annual-reports/

science and social science, with a more critical approach drawing from and resonating with academic movements that have fought to nurture different research cultures, sometimes called alternative, de- or anticolonial, activist, militant, or critical scholarship (eg. Hale 2006, Borras 2016, Mignolo & Escobar 2010, Suoranta 2022, Watts & Hodgson 2019). Overlap certainly exists with the theories and practice in methodologies like participatory action research, co-production of knowledge, Environmental Justice approaches, and Post-Normal Science.

Critical transformative approaches tackle the negative aspects of dominant academia and scientific paradigms, arguing that these largely eurocentric and (neo)colonial forms of knowledge 'production' are designed to benefit military, state and corporate interests above all else (Peake and Kobayashi 2002, Strega and Brown 2005), and are inadequate to address our current socio-ecological crisis (Carpenter and Mojab, 2017). New approaches must counter these failures and limitations in order to more effectively address the issues we face and help create and nurture alternative paths forward.

This thesis contributes to collaborative knowledge theory and methodology for critical, environmental justice-oriented transformative science and research. It aims to act as a pedagogical thesis- operating from a place of praxis for change-making. To do so it dives into communities of academic and non-academic researchers and students across the globe to learn from their experiences working to transform diverse socio-ecological issues. Combining wisdom from our scholarly elders with insights from young boundary-crossing activist-academics and investigators nurturing alternative-building and navigating repression on the frontlines of environmental conflicts, this thesis weaves together lessons learnt, obstacles, and value-imbued approaches to critical research from almost every continent. It concurrently offers examples of how these experiences can be translated into pedagogical activities and research methods for the next generation of researchers resisting and creating on a dying planet.

The main contribution is the conceptualization of a transdisciplinary methodology that can be used to further transformative research goals and fit within a structured

methodological pluralism for a more explicitly environmental-justice oriented Transformative Science approach. As the insights it offers come from ecological economists, environmental justice scholars, conflict transformation practitioners, critical environmental education specialists, and more, who live, work, resist, and research around the world, the methodology has a great deal to offer transdisciplinary, environmental justice oriented research in general.

To introduce this thesis to my readers, I first outline the foundational assumptions and logical path for designing this work, present the research questions, explain the structure of the thesis, and position myself. Then, Section One of the thesis presents the key theoretical frameworks and concepts employed as the foundation for this work. Section Two presents the overarching methodology and methods for answering my research questions, and then the results are presented in Section Three as this thesis' 4 main chapters. Finally, Section Four discusses the key insights from the results, highlighting how they answer my research questions, and concludes.

Foundational Assumptions

My foundational assumptions and the logical path of designing this thesis are as follows:

1. The slow and fast violence of ecological degradation and climate change are real, urgent, and life-threatening (to all life on this planet). (Nixon 2011, Pain & Cahill 2022, IPCC 2022, Global Witness 2022).
2. This overarching crisis is a crisis of relationships, at its roots. (Plumwood 2002, Plumwood 2005, Potts & Brown 2005, Weber & Hermanson 2015).
3. Dominant forms of science are not only failing to adequately understand and address this crisis, but in fact are re-entrenching and (re)producing it. (Peake and Kobayashi 2002, Strega and Brown 2005, Carpenter and Mojab 2017, Saltelli and Funtowicz 2017, Haller 2020)
4. Therefore, researchers, research institutions and funders have an ethical responsibility to seek, develop, support and teach new paradigms that can

adequately address this crisis, and to do so urgently (Lotz-Sisikta et al. 2015, Temper et al. 2019).

5. Transdisciplinary research, Transformative Science and Environmental Justice scholar-activism are approaches well-positioned to tackle the wicked problems we currently face, particularly in dialogue with one another, with certain key questions and gaps that can be addressed to strengthen them. (Schneidewind 2016, Temper et al. 2019, Palmer and Hemstrom 2020, Lotz-sisikta et al. 2015, Blythe et al. 2016).
6. This includes the need for a strengthened identity for critical approaches to transformative science via: centering environmental justice and relational approaches, developing a better understanding how extended peer networks function and the challenges they face, more deeply engaging with bodies of critical social theory, understanding how these researchers navigate the political and academic aspects of their work, developing more structured methodological approaches, and identifying a clearer and more explicit shared, yet plural, value system (axiology). (e.g., Blythe et al. 2018, Hale 2006, Borras 2016, Schneidewind 2016, Clark 2007, Cunliffe 2003, Wittmayer and Schaepke 2014, Palmer and Hemstrom 2020).
7. By exploring research networks engaged in diverse, transdisciplinary, critical approaches to research for transformations and engaging with an array of existing and emergent bodies of critical social theory, we can draw out key lessons and insights to help synthesize a common foundation for environmental justice-oriented transformative science and research better able to address the current crisis.
8. In order to aid in the needed paradigmatic shift we should simultaneously include examples of methods for teaching, learning and practicing this type of research.

These foundational assumptions informed the overarching research questions and structure of the thesis, which are outlined below.

Research Questions

Primary research questions:

1. What are the key principles, values and challenges of an transdisciplinary, collaborative, relationship-centered research praxis for socio-ecological change-making?
2. How can we conceptualize a methodology for a relationship-centered research praxis aimed at transforming the current socio-ecological crisis?

Sub-research questions:

1.Which values and principles are common across diverse critical approaches to transformative research?
3. How do environmental justice-concerned transformative researchers navigate relationships -with others, with themselves, knowledge, and the Earth- -in their work for change-making?
2. How do environmental justice-concerned transformative researchers navigate the political and academic aspects of their work?
4. How can we teach, learn and implement this type of research?

Thesis Structure

In order to answer these questions, the thesis is structured as follows:

SECTION 1: In this section I provide an overview of the key theoretical frameworks and concepts that form the foundation of this thesis. I overview the concepts and frameworks of Environmental Justice, Transdisciplinarity and Co-Production, and Transformative Science. I finish by identifying the specific gaps and needs that this thesis attempts to address.

SECTION 2: This section presents the overarching methodology for this thesis, and then highlights key methods employed and limitations. These fit within a relational, emergent Transformative Knowledge Paradigm approach. My ‘objects’ of study are

transformations-oriented environmental justice research networks. I largely categorize my methods as systematized, radical reflexivity. Specific methods include semi-structured interviews, action-oriented focus groups, creative methods for generative reflections, and collective writing.

SECTION 3: This section consists of the four main chapters, presenting the results of the thesis research.

Chapter 1, *From Academic to Political Rigor: Insights from the 'Tarot' of Transgressive Research,* is a modified version of the final draft of an article published in *Ecological Economics* of which I am third author (co-authored by Leah Temper and Dyl McGarry). This chapter examines the foundation of research for socio-ecological transformations, overviewing diverse critical existing and emergent scholar-activist approaches and centering these under the concept of political rigor. It draws from a literature review and insights gleaned from a co-developed pedagogical activity for researcher reflexivity, and results in the development of a 'tarot' deck of transformative research approaches, along with the listing of 10 key principles and values of research approaches for transformations. It also defines and offers the concept of politically rigorous peer review as an essential process within transformations research, and elucidates key relational insights. Please cite the published version when citing material from this chapter.

Chapter 2 is a modified version of a final draft of a co-authored book chapter of which I am the first author entitled *Transforming the Map? Examining the political and academic dimensions of the Environmental Justice Atlas*, published in *Crowdsourcing, Constructing and Collaborating: Methods and social impacts of mapping the world today* (deSouza et al., 2021). This chapter examines how political and academic goals and aspirations converge and sometimes conflict in the creation and continuation of the EJAtlas, a global mapping database of environmental conflicts and resistance processes, highlighting the tensions and complementarities between academics and politics that arise as we attempt to map environmental conflicts for transformative goals. To surface these reflections, I systematized and analyzed data from a multi-year user survey. The chapter

shows that in such co-production processes such tensions and contradictions are expected. It deepens our understanding of the concept of political rigor initially developed in Chapter 1 by giving us practical examples, and shows the frequent trade-offs one must make between different priorities and aspects of work which is both politicized and academic. It also surfaces key shared values and relational aspects of this work. Please cite original version of this work when citing material from this chapter, other than material from the final section surfacing shared values, which is a new addition.

Chapter 3 is a co-authored article of which I am first author entitled *Research Worthy of our Longing: Insights for relationship-centered transformations research*. This chapter provides an alternative collaborative pedagogical process for radical reimagining of scholar-activism and engaged involvement in socio-ecological transformations. Specifically, this chapter, co-authored by a global network of early career transformations researchers, describes four methodologies created and practiced for researcher-learning which center epistemic agility, methodological and situational groundedness. These methodologies challenge our research to become accountable to its practice in the world. With an understanding of the learnings from the co-production process of the EJAtlas, and engaging with the Living Aulas Research school, this chapter is based on a collaborative process to examine personal and collective experiences of conducting research on socio-ecological transformations and exploring transgressive research for sustainability from a relational perspective. It provides insight into what a transgressive paradigm can look like in action for up-and-coming transformations researchers and the central challenges, opportunities and institutional changes needed.

Chapter 4 is a modified version of a co-authored book chapter accepted for publication of which I am first author entitled *Co-production of knowledge for environmental justice: Key lessons, challenges and approaches in the ACKnowl-EJ project,* co-authored with Mariana Walter, Leah Temper, and Iokiñe Rodriguez. This chapter examines the uniqueness of co-production of knowledge for environmental justice, how and when this process holds the most transformative potential and the obstacles it faces. The chapter presents the results of the multi-method reflexive process documentation of the

ACKnowl-EJ project. To do this analysis, I designed and facilitated a process for ACKnowl-EJ researchers to engage in on-going reflexive activities to document our research practice, the concept of co-production, our ethics and processes, and relationships with ourselves, others, and knowledge production over the course of the 3.5-year project. I then conducted the analysis on these results to surface key reflections. The reflections include: 1) a definition of Co-Production of Knowledge for Environmental Justice (CKEJ), including key aspects and transformative potential 2) an outline of this type of co-production's key values, and 3) identification of some of CKEJ's key challenges and ways to navigate these.

SECTION 4: The thesis wraps up with a discussion and conclusion, highlighting the key contributions from each chapter towards answering my research questions. It argues that CKEJ (which I propose re-naming Collective Nurturing, or Co-nurturing of Knowledge for Environmental Justice) could be considered a key methodology within a structured methodological pluralism of an Environmental-Justice oriented approach to Transformative Science. I offer a framing of the interconnectedness of CKEJ, its axiology, the politically rigorous peer review process and extended peer networks, and its plural methods. I propose we think of the axiology as The Map, extended peer networks as Critical Cartographers, the politically rigorous peer review process as ongoing Critical Cartography and Journey-making, CKEJ as The Journey, and the coherently plural methods as the diverse forms of tools, nourishment, rest and companionship that help us along this journey (with all of these existing in dialectic, conversational relationships to one another). Finally, I apply aspects of the Alternative Transformations Format to CKEJ as a methodology, identifying its current standing as a true alternative as well as its shortcomings, and the needs for future research to deepen its transformative potential.

Positionality

Photo by James Allen Teague. 2021. Edited by Lena Weber.

I'm a queer, interdisciplinary artist and writer born and raised as part of a settler family in various parts of the region often called the United States and particularly influenced by my German heritage and the landscapes I grew up in; the northern part of the Chihuahuan desert that extends into New Mexico, the swampy sub-tropical city of Houston, and a small island in traditional Suquamish territory by Seattle. My academic writing is a political project; it explores the intersection of academica, ecological destruction, climate change, and activism, aiming to contribute to movements transforming mainstream academia and how research is taught. In my art and poetry, I draw from dreams, memories and lived experience, using mixed methods to explore climate change, queerness, intergenerational trauma, the body as contested territory, and the dreamscape as a place where we meet ourselves. When possible, I try to combine my art, poetry, and academic work. This thesis is almost entirely the latter, but draws from some of the same

sources: a deep grief surrounding climate change and greed, a belief in the interwoven nature of emancipatory struggles and that we can collectively dream better worlds into being, and an interest in the role transgression plays in this world-building. I include some pieces of original art throughout the thesis in order to continue to 'position myself' in relation to the academic writing, as the pieces allow me to express certain key, non-verbal emotions surrounding the issues discussed, drawing from my personal experiences and feelings around the ongoing socio-ecological crisis. As such they should simply be interpreted as an ongoing positioning and personal expression.

SECTION ONE

Houston Floodwaters. Analog Collage, 2021. Lena Weber.

1. KEY THEORETICAL FRAMEWORKS AND CONCEPTS

Environmental Justice and the rise of transdisciplinary, transformative science to address wicked, post-normal problems

In the context of climate change, massive ecological destruction, and widespread social injustice, the world currently faces immense challenges (Future Earth 2014). While terms like the 'Anthropocene' place responsibility for this socio-ecological disaster on humanity as a whole (Malm and Hornborg 2014), critical activists and academics call for us to examine and challenge the structures and systems at the root of this crisis (e.g. Plumwood 2002, Di Chiro 2008, Harvey 1996, Walia 2014, Appadurai 2014, Schlosberg 2007, Klien 2014, Hornborg 2001). This includes recognizing the need to transgress failing structures of dominant science that have contributed to marginalizing other ways of knowing, entrenching and shaping the current socio-ecological crisis and proving their inability to address the 'wicked problems' surrounding us (Saltelli and Funtowicz 2017, Klein 2015, Haller 2020, Spash 2021, Rittel and Webber 1973).

Instead, scholars, activists, and scholar-activists are increasingly turning to transdisciplinary, transformative approaches to science (Clark 2007, Schneidewind 2016, Temper et al. 2019, Palmer and Hemstrom 2020, Lotz-Sisikta et al. 2015, Lang et al. 2012), including conceptions of Post-Normal Science (PNS) (Funtowicz and Ravetz 1994), Environmental Justice (Rodríguez-Labajos et al. 2019; Conde 2014), and Co-production of Knowledge (Palmer and Hemstrom 2020, Conde and Walter 2022).

Wicked problems are those issues that are so complex and messy that conventional science simply cannot solve them alone, including issues around climate change and sustainability challenges (Rittel and Webber 1973, Palmer and Hemstrom 2020). They highlight the need for a transformations research agenda (Clark 2007), and are related to the conceptualization of Post-Normal

Science (PNS). PNS argues that normal science fails to address modern environmental problems because of their specific characteristics including strong uncertainty and high risks (Spash 2012). As defined by Healy (1999), a post-normal situation is one in which spheres of facts, politics and values become muddled, and which threaten disastrous outcomes if not remedied. PNS tends to be exemplified by global environmental change and many modern environmental management issues (ibid.).

Environmental justice activists and movements have grappled with these post-normal, wicked problems on the ground through diverse forms of mobilization (Temper 2018, EJAtlas 2022, Conde and Walter 2022), while academia has responded with the fostering of sustainability science as a field, the incorporation of transdisciplinary research approaches (Lang et al. 2012, Schneidewind 2016a), and a more recent push to adopt transformative science and support research for transformations (Schneidewind 2016a, b). I will now briefly outline each of these approaches.

1.1 Environmental Justice as a movement-informed theory and theory-informed movement

Environmental Justice (EJ) is both a theory-informed movement and movement-informed theoretical framework (Martinez-Alier et al. 2014, Temper and Del Bene 2016) that addresses multiple root causes of the current socio-ecological crisis (Di Chiro 2008, Scholsberg 2004, Weber and Hermanson 2015).

The term ‘Environmental Justice’ originated in Black and Brown communities in the United States resisting disproportionate pollution and contamination of their environment compared to their white counterparts (e.g. Bullard 1993, Bullard et al. 2008, Bullard and Wright 1990, Pulido 2000). This emergent movement focused on issues of fairness, environmental protection, and social equity, surfacing political and ethical concerns around ‘who gets what, when, why, and

how much' (Bullard 2001). Key early concepts included that of 'environmental racism', a conceptualization that grew from a United Church of Christ report on toxic waste and race and now has grown to examine and explain how structural and hegemonic racism shapes the disproportionate exposure to pollution and environmental degradation in racialized communities (Pulido 2000).

Over the years, the movement and framework have expanded and been adopted in diverse contexts, cross-pollinating with academia and related, though unique, movements around the world (Sikor and Newell 2014, Walker 2009, Del Bene 2018, Martinez-Alier 2014, Temper et al. 2015, Sze and London 2008). Certain authors argue that environmental justice cannot be universalized but rather is site-specific (Debbane and Keil 2004, Williams and Mawdsley 2006), yet evidence has been presented of a *global* environmental justice movement (Martinez-Alier et al. 2016). This is a result of the expansion of the original EJ movement and cross-pollination with academia and other like-minded movements around the world, with certain shared concepts that transcend local sites of resistance and are nurtured in gathering spaces and conversations on a global scale. (ibid., Martinez-Alier et al. 2014)

In contrast to mainstream environmentalism, environmental justice movements, even while globalizing, resist uniformity by tackling multiple root causes of the social-ecological crisis (Di Chiro 2008, Schlosberg 2004) in their own specific contexts, building off of pre-existing and intersectional anti-racist, feminist, and economic justice movements, among others. As an analytical framework, it helps us understand the relationships between environment, race, class, gender, and social justice concerns (Taylor 2000).

Taylor (2000) has described Environmental Justice as a 'master frame' because of its ability to link these issues together within one framework. She argues that it is the first framework to explicitly examine human-human and human-nature relationships through the lens of race, class, and gender. The trivalent framework

for justice within EJ that differentiates between distribution, recognition, and representation/participation (Fraser 1995, Scholsberg 2007) has become a staple of the body of theory, though it has faced criticism from decolonial perspectives (e.g. Coulthard 2014, Temper 2018, Álvarez and Coolsaet 2017).

Temper (2018), for example, argues that EJ should move beyond distribution, participation and recognition, to consider relational ontologies of nature, self-governing authority, and epistemic justice, while other authors continue to disturb 'western' conceptualizations of environmental justice, drawing on plural conceptualizations of justice from the Global South (De Sousa Santos 2002, 2014) and calling attention to how diverse emancipatory practices can be informed by non-dominant, non-western epistemologies and ontologies (Escobar 2007, Vermeylen 2019, Mignolo 2011, Álvarez and Coolsaet 2017). Álvarez and Coolsaet (2017) criticize a dynamic in more mainstream Environmental Justice approaches that reproduce the idea that knowledge growing from communities in the global south is inferior and only useful for observation, while theoretical frameworks have to come from 'Western' science. Zeitoun et al. (2019) also argue for an expansion of our understanding of justice that transcends time-bound conceptions.

In order for environmental justice to be transformative, it must recognize plural epistemologies and ontologies, and both the situated and networked aspects of these struggles (Vermeylen 2019). This does not mean acceptance of uncritical plurality and rejection of common threads, however. For example, critical understandings of Environmental Justice increasingly hold plural conceptions of justice dependent on specific contexts and power relations, while tending to center intergenerational well-being as a key value and vision, departing from a relational perspective on how we are (inter)connected (Del Bene 2018, Temper and Del Bene 2016).

It is important to understand the rich role of activist-led science in the nurturing of these shared concepts. Martinez-Alier et al. (2014) have highlighted the activist-led science present in EJ, demonstrating how concepts birthed and nurtured by environmental justice activists (for example, *biopiracy, ecological debt, climate justice,* and *food sovereignty*) have later been adopted by academia. On the other hand, Conde and Walter (2022) call attention to the growing scholarly interest in the role of scientists in Environmental Justice Activism, noting that about 41% of cases registered in the EJAtlas show the involvement of scientists and professionals in EJ movements (EJ Atlas 2021 in Conde and Walter 2022), with the involvement of these actors becoming a key strategy of EJ struggles (Conde 2017). The relevance of the dialogues between knowledges held by local activists and those held by scientists and professionals has been noted (Agrawal et al. 2008, Peluso 1995, Harding 2011, Frickel 2011, Jasanoff 2009 in Conde and Walter 2022).

Del Bene (2018) argues that Environmental Justice can be considered transnational and transdisciplinary in character, shaped by this active involvement and dialogue between activists, scholars, and organizations. It can thus be used as a lens of analysis regarding the praxis of political and environmental transformations, bridging scientific research and social mobilizations. Rich learning can happen when these different worldviews and movements come into dialogue with one another, due to the sense-making that happens when there is tension between 'common sense' (stemming from hegemonic relationships) and 'good sense' (popular practice) (Cox 2014, Gramsci 1991, Conway 2006).

In order to reach overarching EJ goals, it is necessary to restructure dominant economic, social, and institutional systems through a transformative approach rather than an affirmative (reformist) one, in which there are attempts to reduce inequalities without tackling underlying social relations (Fraser 1995, Temper 2018). The transformative restructuring of dominant economic, social and

institutional systems for environmental justice goals must also apply to our knowledge production institutions (Bonta 2009, Harvey 1996) and so we must address the underlying social relations present in knowledge production processes. One way to do so is through deepening our understanding of these dialectical knowledge production processes within and between environmental justice movements, and their relationships with dominant knowledge production institutions.

However, while EJ scholarship is increasingly recognizing the dialectical richness and benefits of activist and academic collaborations and cross-pollination, it is not without controversy in broader academic circles, particularly the increasingly blurred lines between scholars and activists, and the rise of the 'scholar-activist' identity (Schneidewind 2016a). The interplay between different types of scholar-activists, while little understood, likely plays a key role in social transformation (Borras 2016). One central challenge identified has been the probable 'dual loyalties' scholar-activists face between institutional and movement needs (Hale 2006). Thus, a key issue for environmental justice-oriented scholar-activists is how to navigate these tensions in order to conduct theoretically sound political work, *and* politically sound academic work on environmental justice issues in a transdisciplinary approach (Weber et al. 2020), as well as to deepen our understanding of the common threads across plural movements and approaches.

1.2 Transdisciplinarity and Co-Production

Within academia, transdisciplinarity responds to the identified need to combine different ways of knowing and to involve non-academic actors in the knowledge production process in order to more effectively address pressing, real-world sustainability challenges, integrating questions of socio-political justice in research (Moser et al. 2013, Lotz-Sisitka et al. 2015, Kates et al. 2001, Lang et al. 2012, Palmer and Hemstrom 2020, Schneidewind 2016a, Funtowicz and Ravetz

1994). It has been defined as “a reflexive, integrative, method-driven scientific principle aiming at the solution or transition of societal problems and concurrently of related scientific problems by differentiating and integrating knowledge from various scientific and societal bodies of knowledge” (Lang et al. 2012, 26-27).

By combining different ways of knowing and learning, social actors can collaboratively address complex challenges even while facing uncertainty and limited information (Kates et al. 2001). Nowotny, Gibbons, and Scott (2001) argue that when lay perspective knowledge and alternative knowledge are recognized, a shift occurs from solely ‘‘reliable scientific knowledge’’ to inclusion of ‘‘socially robust knowledge’’ that transgresses the expert/lay dichotomy while fostering new partnerships between the academy and society. Within this transdisciplinary paradigm, and “socially distributed” knowledge production, tacit knowledge is as valid/relevant as codified knowledge (Gibbons 1994, 3); quality control is exercised by a community of practitioners rather than by the logic of narrow disciplinary academic criteria (Gibbons 1994, 33) and success is defined in terms of societal usefulness and problem-solving ability.

Since a landmark conference held in Zurich in 2000 on “Transdisciplinarity: Joint Problem Solving among Science, Technology and Society”, transdisciplinary research as a discourse has continued to expand (Klein et al. 2001, Schneidewind 2016a), with its basic principles now adopted by international science programmes like Future Earth, embracing concepts like ‘Co-Design’ and ‘Co-Production’, explicitly fostering roles for non-academic actors within research processes (Schneidewind 2016a, Conde and Walter 2022).

Theories of ‘Co-production’ are present across disciplines beyond sustainability science, including public administration and science and technology studies (Miller and Wyborn 2020 in Conde and Walter 2022, Bell and Pahl 2018). The term however usually tends to be associated with Science and Technology Studies (Galopin and Vesuri 2006), a fairly young field that examines knowledge

societies and the connections between knowledge, culture and power (Jasanoff et al. 1995). Jasanoff (2004, 2) defines co-production as 'shorthand for the proposition that the ways in which we know and represent the world (both nature and society) are inseparable from the ways in which we choose to live in it.' The concept of co-production helps us highlight power, knowledge, and expertise in 'shaping, sustaining, subverting or transforming relations of authority.' (*Ibid*, 4). It is an approach increasingly used by activist researchers collaborating with environmental justice movements and investigating issues around environmental degradation, in a transdisciplinary format (e.g. Conde and Walter 2022).

While there is a strong body of research on the challenges of transdisciplinary co-production (Lang et al. 2012; Pohl and Hirsch Hadorn 2008; Pohl et al. 2017), there is no general agreement on terms/definitions, standards for researchers and funders, and processes and methods have to be tailored to specific problems and contexts (Palmer and Hemstrom 2020). Further, there is a little attention to how co-production specifically oriented towards increased environmental justice works in practice, and how researchers engaged in these processes navigate their own ethics and the challenges and opportunities presented. New understandings of the roles of researchers in knowledge production processes can be visibilized and examined, particularly regarding the engagement of extended peer communities in post-normal contexts (Funtowicz and Ravetz 1993, Schneidewind 2016a, Wittmayer and Schäpke 2014).

It has been argued that reflexivity regarding knowledge and knowledge production, including on researcher roles and methodology, is a crucial skill for transdisciplinary and sustainability-oriented researchers working with change-oriented agendas (Fortuin and Coppen 2015, Knaggård et al. 2018). This includes the explicit articulation of values, assumptions and normative orientations; and renewed attention to asymmetries in power amongst participants engaging in new approaches, methodologies, and processes of co-production (Temper et al. 2019, Fortuin and Coppen 2015). Researchers are taking on a whole new range of

competencies within these complex and uncertain systems in participatory knowledge production processes (Loorbach et al. 2011), though we still lack a deeper understanding of how these roles manifest and what they look like in practice. Furthermore, there has been a lack of attention to methods for the operationalization of reflexivity, with research students particularly struggling to reflect upon the interests, norms and values that shape scientific research (ibid).

1.3 Transformative Science and Research at a Crossroads

The term *transformative research* is described by the German Advisory Council on Global Change in their flagship 2011 report as research that examines the causes, conditions and development of transformation processes while actively contributing to these processes. (WBGU 2011). In this sense, transformative research seeks to understand transformations while striving to be transformative in and of itself (Wiek et al. 2012).

Transformative science is proposed as a somewhat broader term, building on transformative research to recognize that all knowledge production processes are embedded within scientific contexts (Schneidewind 2016a). It is defined as a:

"specific type of science that does not only observe and describe societal transformation processes, but rather initiates and catalyze them. Transformative science aims to improve our understanding of transformation processes and to simultaneously increase societal capacity to reflect on them." (Ibid., 6)

It supports transformation processes by applying transdisciplinary methods and involving non-academic stakeholders. *Transformation research,* meanwhile, centers on understanding the "basic principles, conditions and progression of transformation processes" (WBGU 2011, 351).

Transformative science, while transdisciplinary by nature, goes beyond transdisciplinarity's primary goal of new knowledge production to focus on an

explicitly interventionist approach, attempting to act as a catalyst for social change (Schneidewind et al. 2016b, Moser 2016). It builds upon the idea of reflexive modernity and a new role for science to transcend its typical functions and work in a transdisciplinary approach to collaboratively achieve normative, shared goals around sustainability challenges (Beck et al. 1996, Reid et al. 2010 in Schneidewind et al. 2016b, Spiering and del Valle Barrera 2021, Schneidewind and Singer-Brodowski 2013). Impact is achieved through different levers, including the coining and development of new terms, frames, narratives and methodologies (Schneidewind et al. 2016a, 2016b).

Furthermore, transformative science contributes to knowledge democratization (Jaeger et al. 2011) and aims to develop new methodological approaches to facilitate the shift from procedural analysis to transformative processes (WBGU 2011, Schneidewind 2016a). There is increasing focus on and funding for transdisciplinary, co-produced approaches for 'transformations' (Future Earth, Schneidewind 2016b), however, amongst those conducting transformative science and research for transformations there is a lack of ontological and axiological coherence, evidenced by the purported end goals of different approaches. For example, many in transformative science use discourses around an end goal of 'sustainable development' (e.g. Spiering and del Valle Barrerra 2021, Bremond et al. 2019) and 'transitions' (e.g. Schneidewind 2016a), and continue to propose and develop transformative science methods to those ends (Spiering and del Valle Barrerra 2021). Others depart from a much more critical understanding of 'transformations' and claim an end goal of environmental justice, social justice, and 'alternatives' to development (Stirling 2014, Lotz-sisitka et al. 2015, Temper et al. 2018, Escobar 1992, Latouche 2009). The lack of conceptual clarity around the term 'Transformations' can hinder its ability to contribute to change-making (Brand 2016, Holscher et al. 2017).

The first approach remains more firmly rooted in sustainability science (Schneidewind 2016a, Holscher et al. 2017) and tends to focus more on technological innovation, and incremental, top-down processes for change

(Holscher et al. 2017). The second, more critical approach, stems in part from critical education (Carpenter and Mojab 2017) and explicitly anti-capitalist, anti-oppression scholarship (Lotz-sisitka et al. 2015), and positions 'transformation' as a radical alternative to neoclassical 'business as usual' and the concept of 'development' (Escobar 1992, Latouche 2009).

Post-development scholars like Escobar (1992), Rahnema and Bawtree (1997) and Rist (1990) put forth that the so-called global North's socio-economic model is one of colonization and that, by deconstructing it, we can offer a matrix of alternatives (Latouche 2009 in Beling et al. 2017). Indeed, the increasing intensity of the global socio-ecological crisis has called attention to the inevitability of a 'Great Transformation' of current 'development' patterns either by 'design or disaster' as Reißig (2011) puts it. Escobar (2015) teaches us that discourses of transformation are not new, but rather a constant aspect of humanity's ongoing longing for more emancipatory and enlightened alternative ways of living. They often stem from marginalized majority groups within a population and root their critiques of social injustice within critiques of social pathologies, necessarily departing from the Western-style idea of development, contesting the hunger for unlimited growth and blind faith in mainstream science. (Beling et al. 2017)

In this understanding, transformation refers to a process of challenging and reconfiguring neoliberal capitalism as the current dominant global political economic system, along with its authoritarian tendencies. These processes of radical challenges to dominant structures are diverse, disruptive, and emergent, characterized by social innovation rather than technological innovation. Transformation is further characterized by contributing to the emancipation and autonomy of individuals and collectives, through shifting value and belief systems, management and governance regimes, and social behavior. (Westley et al. 2011 in Temper et al. 2018). Key components of transformations include deep social change and inevitable political questionings, particularly about the unsustainability of the current dominant socio-ecological order (Avelino et al.

2016 in Pelenc et al. 2019).

Despite a growing visibility of this more critical approach, within Transformative Science many are using the terms ‘transitions’ and ‘transformations’ almost interchangeably (Holscher et al. 2017), or discuss using transformative approaches FOR transitions (e.g. Schneidewind et al., Loorbach et al 2017, Petridis et al. 2017, Avelino 2017), while others draw an explicit distinction between a transformative vs. transitions approach, arguing for an increased engagement with environmental justice and other critical research approaches and bodies of social theory (Temper et al. 2018, Temper et al. 2019).

The tensions between these different approaches and the resulting confused identity of ‘Transformations’ (Blythe et al. 2016) is similar to a tension within the field of Ecological Economics. The adoption of this field as an emergent, alternative paradigm to mainstream economics has been characterized as hesitant and incomplete, with some practitioners continuing to use neoclassical models and methods, while others adopt a much more radical stance that aims to completely differentiate itself from the neoclassical paradigm (Spash 2020, Spash and Guisan 2021). This has led to calls for a common ontological and axiological foundation and the development of a structured methodological pluralism coherent with these foundations in order to avoid counterproductive uncritical pluralism (Dow 2008, Spash 2012, 2020).

We could thus understand these same calls as similarly relevant for transdisciplinary, Transformative Science, which could be seen at a crossroads to either continue down a more mainstream path very much in line with the concept of sustainable development, drawing from pre-existing methodological approaches, or to embrace a more critical stance focused on environmental justice and alternatives to development. Currently, transformative research continues to primarily draw upon methods from transdisciplinary sustainability science (Clark 2007), though it aims to transcend this approach, and there are explicit calls to develop new methodological approaches for addressing the

socio-ecological crisis (Schneidewind 2016a, Spiering and del Valle Barrera 2021, Caniglia et al. 2020).

Not only could transformative science strengthen a more critical identity by explicitly centering *environmental justice* as an end-goal instead of *sustainable development* via transitions, it could look to Environmental Justice as a guide to avoid an uncritical approach to pluralism that could lead to its misuse. This is because Environmental Justice as a dialectical movement-framework has nurtured shared concepts and strategies while working to maintain a rich pluralism (for example, the plural conceptualizations of justice and recognition of multiple ontologies).

A more critical approach to pluralism would not aim to propose or foster a 'monoculture of norms and values' (Vermeylen 2019) and methods, but rather would aim to identify a common foundation across approaches, even while maintaining that these are still plural and context-dependent. In this way, I attempt to contribute to efforts to avoid uncritical pluralism that would allow for co-optation and a watering down of the radical potential of transformative science and research. Questions around this include: What does a structured methodology look like that is still plural, context-dependent, and generative for adoption, adaptation and growth across contexts, without opening itself up to misuse? What does a shared approach look like that refuses to be impositional or prescriptive, but is rather both situated and networked? Can we hold an understanding of multiple ontologies, axiologies and methods that still have key common threads, while rejecting an uncritical approach to pluralism within Transformations that would allow for acceptance of explicitly harmful ontologies and approaches that reinforce the current socio-ecological crisis?

Another concern is the noted slow diffusion of transformative science in research practice and across projects, which Schneidewind et al. (2016b) attribute to the obstacles in place in mainstream scientific institutions for this type of research. However, it would be interesting to identify the challenges this type of research faces more clearly, and promote its adoption through the diffusion of methods to

teach, learn and implement it.

1.4 Exisiting Gaps and Needs

In order to urgently address the current socio-ecological crisis, we desperately need to understand, develop, and teach more effective ways of doing research. Transdisciplinary, transformative, environmental justice oriented approaches are well-situated to tackle wicked problems, particularly in dialogue with one another. In particular, there is an opportunity to address the crossroads present within Transformative Science and urge it down a more critical path. However, this section has identified specific questions and issues that need to be addressed regarding transdisciplinary research within Environmental Justice and Transformative Science. By doing so, we can strengthen our understanding of an environmental-justice oriented approach to transdisciplinary, transformative science.

In summary, the specific conversations and gaps that this thesis aims to contribute to are:

-A deeper engagement between transdisciplinary, transformative science and research for transformations with critical social science and Environmental Justice approaches
-A deeper understanding of transdisciplinary, scholar-activist extended peer networks and how they operate in post-normal contexts
-A deeper understanding of how environmental justice and transformations scholar-activists navigate the tensions in work that is both political and academic in nature, including their changing roles and engagement with radical reflexivity
-An attempt to understand common values across approaches in order to contribute to a structuring of a shareable methodology
-Insights into tangible methods for teaching, learning and practicing this type of research, with a particular focus on methods for the operationalization of reflexivity

In the following section, Section Two, I describe the methodology and methods I implemented in an attempt to address these gaps.

SECTION TWO

The Last Butterflies. Analog Collage, 2021. Lena Weber.

2. METHODOLOGY AND METHODS

This thesis used a mixed-methods approach informed by diverse theoretical and analytical frameworks coherent with an emergent Transformative Knowledge Paradigm. Transformative Knowledge Paradigms typically imply the use of mixed methods as a way to understand the complexity of the issues they address and propose solutions (Mertens 2012). Critical Transformative research is utopic through goals and action: it aims to contribute to social and environmental justice goals with its results, but also through its very design and implementation.

In this way, the thesis is dialectic, acting as both an exploration and application of a transformative knowledge paradigm that centers relationships and works towards increased environmental justice. In my case, it works towards increased environmental justice via trying to better understand and strengthen the transformational work of researchers working with environmental justice movements. It is important to clarify that while I position this thesis as dialectic and my methodology as in line with transformations approaches, I am not applying the methodology that this thesis later conceptualizes as Collective-Nurturing of Knowledge for Environmental Justice (CKEJ). Rather, my approach here was used to *surface* CKEJ. Methodology to surface methodology.

Instead, I categorize my approach in line with the traditions of Participatory Action Research (PAR) and Queer Methodology, departing from an ethical position (guiding axiology) in line with transformative knowledge paradigms that research should contribute to broader emancipatory goals (Chilisa & Kawulich 2012, Mertens 2012, Escobar 2015). The specific goal I aim to contribute to is the needed transformation and transgression of dominant structures of knowledge production that contribute to (re)entrenching the current socio-ecological crisis. Drawing from my foundational assumptions, I aimed to carry out a relational approach that involved consistent and radical group and individual reflexivity, using the mixed methods approach to draw out rich insights to answer my research questions.

I understand PAR and my application of it as (in line with my master's thesis approach):

"[...] a commitment to deconstructing researcher-researched power structures and embodying a "practice of researching with rather than on, participants" (Lykes 2000 in Cahill, Quijada Cerecer & Bradley 2010, 411). With a commitment to self-reflexivity and the goal of working towards social justice as understood by antiracist and critical feminists, in this project, along with many other PAR projects, echoing Guishard (2009) I seek to "'do something' within a context in which it is urgent" (Cahill, Quijada Cerecer, & Bradley 2010, 407). Cahill, Quijada Cerecer, and Bradley write that PAR "follows in the footsteps of feminist and critical race scholars, who have shown how women and people of color entering the academy not only have an opportunity to transform themselves but also effectively transform the institution. (Hill-Collins 2000; Kelley 1998)" (2010, 410)." (Weber & Hermanson 2015, 26-27).

I understand Queer Methodology in line with fairn herising's (2005) positioning of it on '*thresholds*', queering the power dynamics and divisions between researcher and researched. Queer methodologies allow us to see the indeterminate and socially constructed nature of identity, and to see the potential for transformative research that centers reflexivity (herising 2005, Haritaworn 2007). Participants are seen as "active producers of their own interpretations" within the research process, while recognizing that the researcher "has the last word at the stage of analysis" (Haritaworn 2007, 4).

The queer methodological concept of 'ex-centricity' pushes us to see research as a way to "disrupt the processes that enable the academic to maintain its exclusion of ideas and knowledges that conflict with existing established knowledges" (herising 2005, 143). Queer flexibility, another conceptual tool proposed by herising, shows

us that methodology can adopt a stance of opposition to the status quo, and be used to disrupt normative and hegemonic systems. (ibid.)

I also turn to Maria Heras' (2014) assertion that the path towards transformations is a circular and dialectical relationship between engagement, action, emotions, and knowledge, and that processes that create transformational meaning and learning center on connecting knowledge with emotions, experiences, and critical reflection, while strengthening humans' relational connections to each other and to the Earth.

Thus, I situation my particular methodology in this thesis as inspired by PAR and Queer Methodology within an emergent Transformative Knowledge paradigmatic approach.

2.1 'Objects' of study

My 'fieldwork' focused on research networks and research projects as my objects of study, all of which I personally formed part of. Specifically, these were the Environmental Justice Atlas and its contributor network, the Living Aulas network of early career transformations researchers, and the ACKnowl-EJ network of researchers, with insights from the broader Transformative Knowledge Network Community, as well.

The Environmental Justice Atlas is a global project mapping environmental justice conflicts hosted at the Institute of Environmental Science and Technology Studies (ICTA) at the Autonomous University of Barcelona. With hundreds of contributors and thousands of conflicts mapped, it has become an activist-academic database of reference for environmental justice scholars, practitioners, and affected communities. It thus is an opportune project to study in order to gain insights surrounding activist-academic research with explicit transformational goals on an international scale.

Meanwhile, the two networks selected for study formed part of the Transformative Knowledge Networks (TKN) funded by the International Social Science Council. TKN networks were selected for funding via a rigorous selection process. The ISSC took a novel approach of funding three pilot projects with a global membership focused on sustainability and led by social scientists and activists instead of by natural scientists. The three funded projects were the ACKnowl-EJ Network, the T-Learning Project, and PATHWAYS to Sustainability. Early career researchers from all three networks conformed the Living Aulas network, for which the ISSC funded an alternative research school.

The rigorous selection process for funding and social-science orientation along with the inter/transdisciplinary make-up, 'activist'-academic leanings and widespread nationality of the member researchers (each network was co-led by a group from the 'global south' and one from the 'global north'), created an ideal selection of networks to study in order to understand cutting-edge transformations research from an interdisciplinary, global, social-science oriented perspective.

2.2 Methods of data collection and analysis

In order to study these groups, I adopted a mixed methods approach. In line with transformative approaches to research and informed by anti-oppression and queer theory, alternative and multiple methods of data collection can help mitigate negative power dynamics and produce analytically rich results (Weber & Hermanson 2015). Because each chapter only briefly mentions the methodology and methods employed, here I present the key methods employed:

2.2.1 Survey analysis and Google analytics

Data presented in Chapter 2 was collected via survey analysis and Google analytics. The survey used was designed prior to my start of the PhD by the EJAtlas team, in order to understand who was using the Atlas, why they were using

it, and how it could be improved. I took this data and sorted responses into Excel sheets and then cleaned the data set, with 429 total responses once clean. These were sorted into six categories based on respondent identifiers and analyzed. Analysis was further supported by our access to the Google Analytics of the EJAtlas website.

See Annex 1 for survey questions.

2.2.2 Literature reviews

Relevant literature was reviewed consistently and included throughout the thesis. My approach to literature reviews is in line with a meta-synthesis, narrative review approach. In this approach I do not attempt a comprehensive review of all existing relevant literature (due to the breadth of disciplines I engage with this would be quite unrealistic), but rather aim to analyze relevant qualitative literature in order to understand, apply, identify gaps and build upon existing concepts and ideas (eg. Danson & Arshad, 2015; Paré and Kitsiou, 2017).

Paré and Kitsiou (2017) explain that a narrative review is a 'traditional' approach for qualitative interpretations of existing literature, summarizing this interpretation without attempting to present cumulative knowledge. They note that while this is a rather unstructured, subjective approach that could lead to biased interpretations and gaps, this type of review is quite useful in terms of synthesizing insights from a large volume of literature in order to offer a background of understanding for the reader. They also note that narrative reviews are favored by teachers as a way to introduce their students to peer-reviewed literature, and that this style of review helps researchers identify gaps or inconsistencies in order to determine research questions and form hypotheses. (Ibid.)

2.2.3 Systematized, radical reflexivity

An overarching method for this thesis, systematized reflexivity refers to structured approaches to both group and individual reflexivity that can draw out key insights and lessons to inform research design, implementation, and analysis, as well as relevant bodies of theory. Other than the literature reviews and the specific methods employed for the EJAtlas chapter, the other 'data' emerged via processes of systematized group and individual researcher reflexivity, directly engaging with the researchers involved.

My approach to understanding reflexivity draws from England (1994) and Cunliffe (2003).

Feminist scholar Kim England defines reflexivity as a "self-critical sympathetic introspection and the self-conscious analytical scrutiny of the self as researcher" (1994, 244). Reflexivity as a method, she explains, was proposed to try and address power dynamics between researchers-researched and how difference impacts experiences in the world. According to England, reflexivity guides us to consider a researcher's position in relation to her context and overarching social dynamics, and then to understand the possible impacts that said researcher's position can have on the research process.

Taking this process further, Cunliffe (2003) offers us a conceptualization of *radical* reflexivity, with seven interrelated elements:

(1) questioning our intellectual suppositions;
(2) recognizing research is a symmetrical and reflexive narrative, a number of "participant" stories which interconnect in some way;
(3) examining and exploring researcher/participant relationships and their impact on knowledge;
(4) acknowledging the constitutive nature of our research conversations;
(5) constructing emerging practical theories rather than objective truths;

(6) exposing the situated nature of accounts through narrative circularity; and
(7) focusing on life and research as a process of becoming rather than the already established truth.

Cunliffe's approach would have us reflect upon ourselves to deconstruct our own constructions of identities, knowledge, and realities.

I categorize the following methods under the umbrella of systematized, radical reflexivity, since they all were implemented as a way to guide researchers to reflect upon themselves and their individual and group processes and experiences directly related to their research (and not, say, to reflect upon issues unrelated to research and their identities as researchers, which would be harder to specifically categorize as reflexivity as currently understood within the social sciences).

2.2.3.1 Process Documentation

Within the umbrella of systematized, radical reflexivity, there is another overarching method used: Process Documentation.

I position this as another overarching method, because of the variety of sub-methods I employed. Process Documentation was the primary method of systematized, radical reflexivity employed within the ACKnowl-EJ project to surface the insights gathered and presented in Chapter 4 of this thesis. I designed and facilitated the process, and carried out all data collection and analysis, with support from project co-coordinators Leah Temper and Ashish Kothari, employing jointly defined and shaped concepts and methods.

Within ACKnowl-EJ, we defined process documentation as *an active reflection on the knowledge practices involved in environmental justice struggles and research and our intention to transcend disciplinary silos and overcome the activist-*

academic dichotomy, while creating emancipatory theory and a new (critical) research praxis based on an 'ecology of knowledges' (de Sousa Santos 2014).

Drawing from and aiming to more deeply develop the concept of Political Rigor (Borras 2016), ACKnowl-EJ researchers engaged in a variety of process documentation activities over the span of the 3-year project. These activities included semi-structured interviews, written reflections, focus groups, and creative activities, among others.

Below, I explain several of these.

Written reflections

To document their research processes, ACKnowl-EJ teams were asked to keep written documentation regarding a series of questions that had been circulated to aid in guiding their reflexive processes.

A first set of responses was requested from each team on at least one of their ACKnowl-EJ activities in January 2018 in order to reflect on our process documentation thus far and refine the process moving forward. Teams could respond to a set of seven baseline guiding questions or a more in-depth list of 11 further questions. Three teams responded to the seven baseline questions (UK/Bolivia, Turkey, and Lebanon), while two responded to the 11 in-depth question list (India and Spain). Responses spanned both case study work (UK/Bolivia and Turkey) and EJAtlas activities (Lebanon, Spain, India). I then collated and synthesized the results of these reflections, using them as a basis to develop further questions for the semi-structured interviews to follow, and returned the results to the team.

See Annex 2 for the written response questions.

Semi-structured interviews

I conducted interviews with members of every ACKnowl-EJ team, in some cases multiple members (11 total), in order to guide and gather their reflections regarding the relational aspects of their research world and their understanding of co-production of knowledge for environmental justice. I then synthesized and collated their responses to return them for collective reflection at our final project meeting in Istanbul, Spring of 2019. The semi-structured interviews were individual one-on-one sessions held virtually due to the international nature of the network, in order to create space for reflections that may not have emerged in the other, more collective spaces of reflection.

See Annex 3 for the semi-structured interview questions and concept note.

Reflexive, Action-oriented Focus Groups

Focus groups were another method employed as part of ACKnowl-EJ process documentation, as a way to foster collective analysis and reflection and then produce key, collective results. An example is a group activity I designed and facilitated at the final project meeting in Istanbul, 2019, to offer back to the group a synthesized version of their individual and team reflections surfaced through the written reflections and semi-structured interviews. The focus group in this case was used as a method for review of data collection and then to reach group consensus regarding key results of our process documentation, including a joint definition of Co-Produced Knowledge for Environmental Justice. In this way, it was action oriented; the focus group was not held simply to surface and extract information in a group setting but rather to help us reach a specific, collective goal.

2.2.3.2 Alternative Research School design and implementation

I was part of a small team of early career researchers spanning the three

Transformative Knowledge Networks (T-Learning, ACKnowl-EJ, and Pathways) that collaboratively designed and implemented the Living Aulas Alternative Research School for our early-career network peers in Quindio, Colombia, 2018.

I present this as a key method, because of its purpose in setting the needed stage for the generative, reflexive knowledge nurturing that took place at the school, which then served as the basis for our collectively written article (Chapter 3).

The collaborative and experimental nature of the design and implementation, a methodology we call 'Growing Transformative Research Cultures' in the Living Aulas article, could serve as an example for other groups of transgressive, experimental researchers interested in fostering similar collective spaces to generate reflexive knowledge.

See Annex 4 for the Living Aulas description and agenda.

(Participants in the Living Aulas Research school in Quindio, Colombia, 2018. Photo credit: Andres

2.2.3.3 The Tarot Process

The Tarot process is a creative, generative method designed by myself, Leah Temper and Dyl McGarry. It is a simple, arts-based activity for structured reflexivity, that guides researchers and/or activists through a process of reflection into their roles and actions in their work, helping to identify core values. Using the medium of collage (and poetry in some workshops), researchers can tap into their individual and collective inner worlds in different ways in order to surface novel insights and help define their role as scholars and activists navigating post-normal contexts and wicked problems. Because the way we conducted the workshops was always in a group setting, the sharing process amongst an extended peer network played a key role in helping the researchers put their work into words. The act of naming themselves and their role based on their collage and writing also helped surface the core of their reflexive act.

See Annex 5 for an example of a guide to facilitate this activity.

Lund University MSc. Human Ecology Students after participating in a modified version of the Tarot activity including poetry for a methodology course on activist research in 2019. Photo credit: Lena Weber.

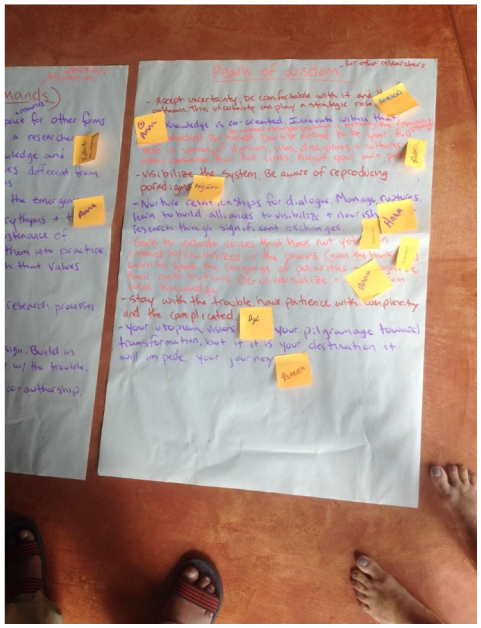
2.2.4 Collective writing

There are many ways to approach collective writing, and several different ways were used throughout this thesis. For example, for the Tarot process, Leah Temper, Dyl McGarry and myself spent some days holed up together in a small house in the mountains of Lebanon after an ACKnowl-EJ meeting in order to foster an intimate, in-person space for collaborative reflection, analysis, and writing. The chapter on the EJAtlas and on the results of ACKnowl-EJ's process documentation were written in a different format, in which the lead author conducted analysis and wrote first drafts that were then contributed to by co-authors, with specific parts assigned amongst co-authors, and with co-authors also being involved in determining specific directions of analysis and other aspects of the research and writing but to a lesser extent than in processes like the Tarot paper and the Living Aulas paper. Here I would like to highlight the method used for the Living Aulas process, because I believe it offers a creative and generative option for other researchers to adapt to their contexts.

To begin, I designed and co-facilitated a session at the Living Aulas research school in order to decide how we wanted to approach a collaborative paper and what insights we wanted to include. We started by dividing into groups, discussing, and then each offering a title back to the main group. With a collection of working titles, we were able to have an overarching idea of the ideas and approach we wanted to take. Then, the researchers decided which paper they would each like to collaborate on. We then decided to identify pearls of wisdom and thorny questions we collectively surfaced during the school, and the main collaborative paper grew organically from that basis. Other proposed titles turned into non-academic outputs like blog entries, while ideas generated by another title provided a basis for a future collective book chapter with many of the same co-authors.

In the collective paper that now forms part of this thesis, we used a collaborative writing style in line with an experimental dialogical style used by members of the T-Learning project (eg. Kulundu et al. 2017 and McGarry et al. 2021). This style aims to maintain individual writing styles instead of homogenizing them for a more uniform presentation.

(Living Aulas researchers participate in a collective writing activity designed to reflect upon the knowledge and reflections generated at the school and organize these into a collaborative article. Photo credit: Lena Weber)



(A close up image of some of the reflections surfaced and collected for our collaborative article. Photo credit: Lena Weber)

2.3 A note on the collaborative approach to my thesis work

All knowledge is collaboratively produced, because we do not exist in individual isolation. Ideas and knowledge emerge from our conversations and contact with others and the world surrounding us, whether through reading, interviews, analyzing or observation from a distance, or simply through our everyday relationships, including our relationship with the Earth. However, activist research approaches tend to more explicitly center the transformational potential of intentionally collaborative knowledge cultivation, as well as more openly and actively acknowledging the collective nature of the work instead of taking an individual focus. This might be called movement knowledge, co-production, participatory action research, or might be through the recognition of and/or nurturing of an extended-peer network.

It only makes sense that a thesis on the relational aspects of transformations research would aim to center relationships throughout the research design and

process, including co-authorship and collaboration. A methodological decision I made at the beginning of this PhD journey was to co-research and co-write all the main chapters of my thesis, in line with how I conducted my masters work at Lund University (where I co-authored the entire thesis with Anna Hermanson).

This methodological decision stems primarily from the belief that working as part of a team can increase both the academic and political rigor of research and writing. My masters thesis included a structured reflection on the process of co-authorship as a method, which reaffirmed the argument by Cahill, Quijada Cerecer & Bradley (2010) that co-writing is one way to transgress and challenge the dominant tendency of academia to value individualism (Weber & Hermanson 2015). Despite much of the material being co-authored, I do believe the work represented and my specific leadership and contributions are at par with more individually authored theses in my institute. Furthermore, while co-design and analysis is a central aspect of participatory, transdisciplinary and co-produced approaches to research, it is much less common that the community members/activists/participants are recognized as co-authors. I engage with researchers and research networks, so it is perhaps more straightforward to take a co-authorship approach, but I see my role as in line with the role of researchers in other PAR processes in which co-design and analysis is a central part of the process, whether those that participate are officially recognized as co-authors or not. For example, not all co-authors on the Living Aulas paper participated in the writing process itself, but recognizing the whole collective as co-authors is a way to recognize their role in the surfacing and analysis of the knowledge included in the paper. The amount of effort that goes into designing and implementing collaborative methods (including writing), especially emergent, experimental methods, is quite significant! I hope that this section on methodology and methods provides some insight into that. I also celebrate that it is not at all uncommon within my institute for theses to include co-authored material. Co-authorship does not mean less work went into a section than if it had been individually authored. Instead, in my experience, the amount of personal intellectual energy, attention and

analysis that goes into co-authored work is at par or greater than my individually authored work, due to the inevitable discussions and debates between co-authors that take place. It brings aspects of the peer-review process directly into the researching and writing processes, whereas in individual work that process often happens later on.

2.4 Limitations

There are several limitations to this thesis project that I would like to highlight here.

1) Because the thesis engages with a wide array of critical bodies of theory and approaches to research, it offers more of a 'breadth' of perspective rather than 'depth', as it would if it had engaged more deeply with one or two bodies of social theory or approaches in particular. I believe there is a great deal of potential to dive deeper into Queer Theory, for example, placing it in more meaningful dialogue with Research for Transformations. I hope to do so in the future.
2) The thesis centers on scholar-activists and environmental justice knowledge associated with the Environmental Justice Atlas (EJAtlas) and the three Transformative Knowledge Networks funded by the International Social Science Council. While on the one hand I believe that it provides insights from researchers on the cutting edge of transformations work, it also limits its perspective to these networks and could be greatly enriched in the future by engaging with other communities and networks of researchers outside of these. It thus cannot currently be considered a comprehensive review and study, but instead is a contribution to ongoing conversations regarding these topics.
3) Returning to the issue of 'breadth', another limitation is that there are many other critical works, authors and bodies of theory that I simply did not have the capacity to engage with in a meaningful way in the analysis stage, but that could further strengthen and enrich these discussions. These include deeper engagement with the tradition of participatory action research

(PAR), decolonial theory, queer theory as mentioned above, and critical pedagogy. And so, again, this thesis should be viewed not as a comprehensive engagement with useful critical theories and methodologies, but instead a continuation of an ongoing conversation that contributes specific insights from those bodies it does engage with.

4) Perhaps the largest limitation is that, by centering attention on the formal networks of researchers, the other voices of the members of these researchers' extended peer networks, including many of those most affected by the environmental injustices discussed, are not directly included. This is a serious weakness that should be addressed in future research. As the thesis identifies the multi-levelled nature of extended peer networks, this work should be understood to only engage with and elucidate reflections from certain sectors of these extended peer networks most closely affiliated with research institutions, and not the comprehensive networks themselves.

SECTION THREE

Queer visions. What is natural, what is transgression? Analog collage, 2021. Use of photographic material from Eliya Akbas. Lena Weber.

3.1 Chapter 1

From Academic to Political Rigor: Insights From The 'Tarot' of Transgressive Research

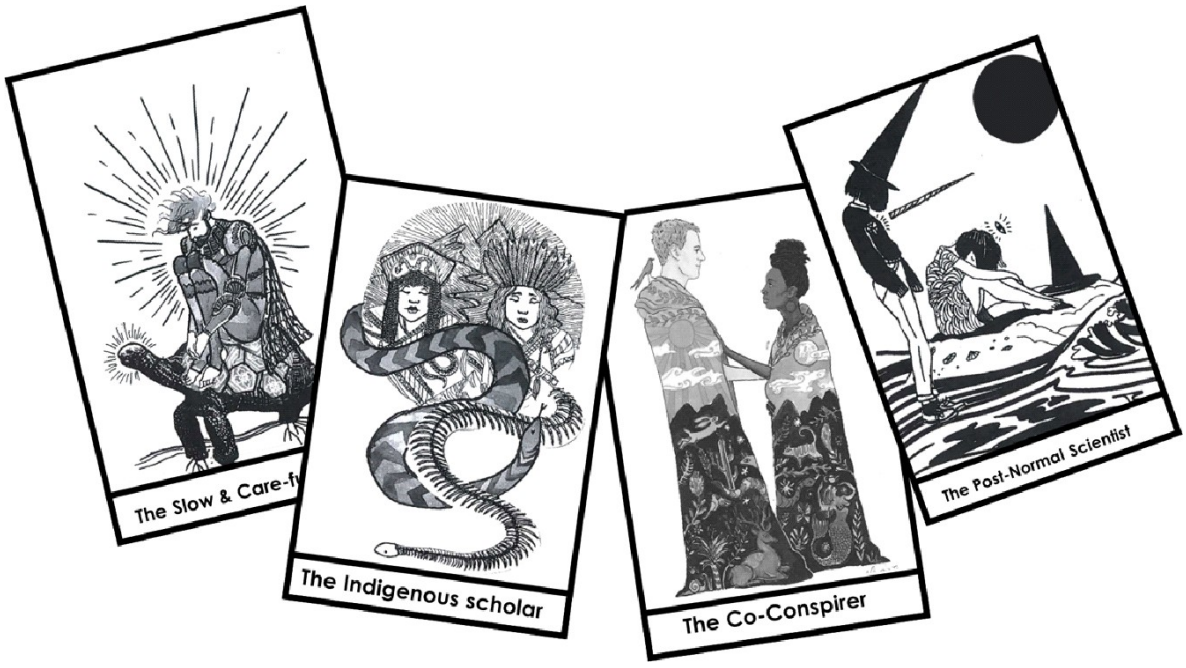


Figure 1: The Tarot Deck of Transgressive Research (all images by Dyl McGarry)

3.1.1 Introduction: The Point is to change it

In the context of climate change, massive ecological destruction, and widespread social injustice, the world currently faces immense challenges (Future Earth 2014). While terms like the 'Anthropocene' place responsibility for this socio-ecological disaster on humanity as a whole (Malm and Hornborg 2014), critical activists and academics alike increasingly call for us to turn attention to the structures and systems at the root of this crisis, recognizing that true transformation will depend on identifying and resisting the entrenched power interests that dominate our personal and professional landscapes (Temper et al. 2018).

Within this transformation, the role of science and knowledge production itself is at a crossroads, as societal transformation calls for challenging dominant forms of knowledge production and the established protocols and discourses that have contributed to marginalizing other ways of knowing (Klein 2015). The critique and diagnosis of the current crisis in science (Saltelli and Funtowicz 2017) has led to calls for trans-disciplinarity, conceptions of post-normal science (Funtowicz and Ravetz 1994) to deal with wicked problems that cannot be solved by purely scientific-rational approaches (Rittel and Webber (1973), the rise of activist-led sciences such as degrowth (Weiss and Cattaneo 2017) and environmental justice (Rodríguez-Labajos et al. 2019; Conde 2014), and a discourse on the need for "transgression" of academic protocols.

Trans-disciplinary research, which integrates knowledge from various scientific and societal bodies of knowledge and includes participation of actors from outside of academia to create legitimacy and ownership, is increasingly seen as necessary for addressing and responding to sustainability challenges, and also for integrating questions of socio-political justice in research (Moser et al 2013, Lotz-Sisitka et al, 2015), and as such contributing towards a new scientific paradigm based on very different principles from those dominant today.

Other scholars are putting forward the notion of transgressive learning and science, which refers to boundary crossing and challenging oppressive normative structures, and is defined by Lotz-Sisitka et al (2016:51) as "critical thinking and collective agency and praxis that directly and explicitly challenges those aspects of society that have become normalized, but which require challenging for substantive sustainability transformations to emerge (e.g. colonial practice or epistemology, gender and race relations, social exclusion,, environmental injustice) (Hooks, 1996; Dei, 2012)". It focuses specifically on structures of privilege, hegemonies of power, and innovative strategies to arrest systemic dysfunction or systemic violence, and it foregrounds epistemic, social and environmental justice (Hooks,

1996; Dei, 2012; Lotz-Sisitka et al, 2015). Finally, transformative research is a concept that delineates a new role for science, which goes beyond observing and analyzing societal transformations to act as a catalyst for social change (Schneidewind et al 2016). While the primary goal of transdisciplinary science is to produce new knowledge based on a scientific or societal question, transformative research and education takes a key role in establishing creative laboratories and room for experiments in a broader societal context. According to Pennington et al. (2013), transdisciplinary science and the engagement with stakeholders it entails can provide opportunities for the "disorienting dilemma" that can lead to transformative learning through the restructuring and integration of concepts, data, and methods.

The call for transgressive and transformative science while novel, extends and echoes a long tradition of scientists and scholars openly and unapologetically committed to radical social change (Marx 1980) that has been variously denominated as militant, emancipatory and solidarity-based research, and which we refer to as engaged or activist-scholarship. While approaches like Post-Normal Science (PNS), often embraced by ecological economists (eg Silva and Teixeira 2011), hold potential for navigating activist research environments in which facts and values are so closely intertwined, a key problem with PNS is that it does not offer a clear theory of science and methodology remains underdeveloped (Spash 2012), Further, it as of yet lacks meaningful engagement with other schools of radical scholarship. Indeed, until the present there has been minimal engagement and synthesis between transdisciplinary sciences such as ecological economics (Costanza 1991; Shi 2004) and the diverse modes of radical and transgressive scholarship we explore here.

In this article, we argue that the discourse and practice on the needed transformation of science must bring these diverse activist and transgressive approaches into dialogue. This includes learning from activist, queer, feminist, indigenous and non-Western approaches and methodologies, embodied ways of

knowing, and further openness to novel approaches and experimentation. We do not propose acceptance of the uncritical plurality argued by Dow (2007) and Spash (2012) as counterproductive, but the opposite. We argue that a deeper engagement with diverse approaches, and the identification of shared principles, perspectives, and methodological approaches can bring greater theoretical and methodological clarity and coherence to activist-scholarship.

This paper is our offering to researchers interested in conducting research for transformation under this evolving paradigm, where resources and information can be difficult to find. While many agree on the need to enhance and complement the sole focus on traditional 'scientific' rigor within a positivistic framework (Taconi 1998), alternative quality standards for transformations research remain only partially developed. We therefore gear this paper towards activist-scholars and other socially engaged researchers navigating this new post-normal world.

For the purposes of this article, we consider the activist scholar as one who learns about the world through transforming it (and vice versa), inevitably transforming herself in the process. Our aim is therefore to explore the concept of transformative and transgressive activist scholarship, and to provide a roadmap of sorts for the intrepid researcher that is aiming to do both politically rigorous and scientifically robust research.

After positioning ourselves and our motivations, we propose the concept of 'political rigor' as a necessary component of transformations research and explain the methodology of the collaborative reflexive process of the Tarot. We then provide a 'guide' to some of the critical, theoretically-informed activist-scholar approaches being adopted by environmental justice and sustainability researchers. To do this, we use both the metaphor and the practical device of the tarot deck to draw from and point to diverse literature largely absent until the present in mainstream sustainable environmental sciences research. These include feminist scholarship and ethics of care, indigenous and decolonizing methodologies, critical

realism, queer theory, embodied research, environmental education, and anti-oppressive research.

We conclude by arguing that these tangible examples of how activist-scholars are engaging with the complex spaces they live and work in can significantly improve the understanding of what a transgressive knowledge paradigm centered on the concept of political rigor may look like in practice and how it can be mobilized for social change towards environmentally just outcomes. Deeper engagement and analysis of shared aspects of praxis amongst these diverse approaches also brings greater clarity regarding methodological coherence for transdisciplinary sciences like ecological economics. We define and present political rigor as a tool for bringing reflexivity and consciousness to every step of the research process we are engaged in and call for the elaboration of other tools, disruptive practices/pedagogies, games and exercises that can help guide a reflective process of political rigor.

3.1.2 Positioning Ourselves

We are three scholar activists who have been engaging with and mixing different approaches to environmental science, transgressive social science, education, art, activism, teaching, and transformations research. We come from inter/transdisciplinary backgrounds: ranging from ecological economics, environmental science, biology, educational sociology/art and human geography. Understanding social and political dimensions of sustainability, we have worked carefully with our peers to develop a device for carefully engaging with the reflexive rigor needed to respond to the social and political dimensions of the environmental crisis.

After facilitating a reflexive collaborative process with a wide spectrum of academic activists in Beirut Lebanon, in 2017, we went on to refine and develop this process in South Africa, Mexico, Canada, Sweden, Spain, Colombia and the

UK, with other academic activists and sustainability practitioners. We have developed the tarot as a metaphor and device for making the socio-political and ethical engagement with the social challenge of sustainability more accessible, reflexive and attentive.

This paper serves as a theoretical base for this process and arises from our experiences of having to transgress typical roles and responsibilities of researchers in the academy, where the concerns, needs, tensions and issues we are working with, as well as our personal contexts, demand counter-hegemonic approaches. At the same time, some of our peers (often bound by bureaucratic, cartesian and positivist orthodoxies) sometimes struggle to support us as early career researchers working on these issues. We are also inspired by the errors we have made, the struggle of dealing with the imperfectness of working with 'wicked problems' (a term Rittel and Webber (1973) used to describe the complexity of social and environmental problems which could not be solved by purely scientific-rational approaches.) that are in a constant state of flux; as well as what is emerging from our research community: we see our peers grappling with similar struggles and having to navigate these issues in a similar way, and so this paper has emerged as a way to acknowledge these struggles and open up communal reflexivity.

3.1.3 Literature Review: Juggling Academic and Political rigor

It is increasingly acknowledged that trans-disciplinary research (TD) necessitates new forms of radical reflexivity (Cunliffe 2003). This includes the explicit articulation of values, assumptions and normative orientations; and renewed attention to asymmetries in power amongst participants engaging in new approaches, methodologies, and processes of co-production. Such reflexivity signals the need to move beyond principles of academic rigor such as internal validity, external validity, reliability and objectivity integral to a positivist framework, to include new approaches of assessment centered on accountability to the communities we work with and for, as well as accountability to ourselves as

individuals and to informed by our values, knowledges and belief systems. Rather than a dichotomy, these new approaches can be synergistic.

There have been proposals to critically evaluate transformative research, its methods, processes, impacts and ways of engaging with other knowledge holders, that we may draw from in this endeavor. Merton's "ethos of science" (1973) proposed the acronym CUDOS, standing for values such as Communalism (a scientist ought to make knowledge accessible to other scientists, as knowledge is common ownership), Universalism (scientists ought to assess knowledge claims based on pre-established objective criteria), Disinterestedness (a scientist may not hold conflicts of interest that can corrupt the research results) and Organized Skepticism (scientists ought to conduct organized quality control of knowledge claims.) (Merton 1973).

Nowotny, Gibbons, and Scott (2001) argued that when lay perspective knowledge and alternative knowledge are recognized, a shift occurs from solely ''reliable scientific knowledge'' to inclusion of ''socially robust knowledge'' that transgresses the expert/lay dichotomy while fostering new partnerships between the academy and society. Within this trans-disciplinary paradigm, and "socially distributed" knowledge production, tacit knowledge (i.e. unwritten, unspoken, and hidden knowledge held in practice by very normal human beings, can include emotional knowledge, emotions, experiences, insights, intuition, observations and internalized information) is as valid/relevant as codified knowledge (Gibbons 1994:3); quality control is exercised by a community of practitioners rather than by the logic of narrow disciplinary academic criteria (Gibbons 1994:33) and success is defined in terms of societal usefulness and problem-solving ability.

Van der Hel (2016) identified questions of accountability, impact and humility as the key logics within knowledge co-production. Other frameworks for critical evaluation of TD research include Mitchell et al's (2015) outcome spaces framework for purposive transdisciplinary research, Pereira and Saltelli's (2017) call for reflexivity, quality assurance and an ethos of care in post-normal science, and Kønig et al´s (2017) ethos of post-normal science. Writing on the crisis of

science, Saltelli and Funtowicz (2017), drawing from Mellanby et al (1971) point out that the replacement of the 'Gemeinschaft', the community of scientists whose personal acquaintance kept them committed to a high moral standard, by a 'Gesellschaft', where the worth of each member is evaluated by 'objective' metrics, has led to degeneration and corruption of the practice of science. They offer several correctives on how to cope with the democratization of expertise, and the need for new forms of peer review and quality control as a partial resolution to the impasse.

However, while these scholars and others propose a variety of tools for doing and critically evaluating transdisciplinary and activist research in a post-normal context, there has been a lack of engagement to date between this literature and an array of long-standing and emergent activist-scholar approaches that could have important relevance for mainstream science's need to understand and address sustainability as a social challenge, not just an environmental one.

This includes a body of literature dedicated to the relationship between research and politics; ranging from the emancipatory praxis advocated by Freire (2000) and other participatory action researchers (Chambers, 2009, Fricker, 2007) to a rich body of work on the problematic of politically committed research (Gramsci 1971) and on questions such as methodological implications and negotiation of power relations within the research process; how questions are formulated, which publics they serve (Potts and Brown 2005), how participatory the approaches are (Lotz-Sisitka, 2009; McGarry, 2013), to more practical questions such as how to deal with risks of activism such as threats and silencing tactics (Flood et al 2013), to how science can be mobilized and led by activists to serve their needs and contest pollution (Conde 2014).

Literature on scholar-activism has also examined the challenge of the "dual loyalties" (Hale 2006) that scholar-activists must juggle while trying to ensure both academic and "political rigor".

Scientific rigor can be defined broadly as "the development of new knowledge and innovation using a methodology that ensures the reliability and relevance of results". It differs amongst disciplines but may entail application of the scientific method, substantiating assertions, referring to sources and the broader literature, distinguishing between facts and interpretations and clearly presenting how you arrived at your results. Rigor demands robustness, meticulousness and carefulness theoretically, methodology and empirically. It guards against recklessness, cherry picking, lack of attention and groundless conclusions. It also demands openness to fallibility – "the destruction of beautiful ideas by facts."

While laudable, it is important for scientific rigor not to become rigid. Along with rigor, vigor is also key. And scientific rigor alone is often not enough. In his "Manifesto of Trans-disciplinarity", Nicolescu (2002) posits that the three characteristics of a transdisciplinary perspective are rigor, opening and tolerance. According to him, the rigor of transdisciplinarity goes even deeper than scientific rigor, "to the extent that it takes into account not only things but also beings and their relations to other beings and things. Taking account of all the givens present in a particular situation is a characteristic of this rigor. It is only in this way that rigor is truly a safe-guard against all possible turns. Opening brings an acceptance of the unknown, the unexpected and the unpredictable (p.120).

Along the same lines, Jun Borras (2016:33), argues that political rigor

"means being politically informed and thorough, sensitive and nuanced, and timely and relevant. It should be the opposite of a post-mortem way of thinking and doing things. It means taking a position on political processes that are being researched which in turn runs the risk of compromising the rigor of the academic dimension of the research."

In this paper, we extend the concept of political rigor, as one that can be potentially

fruitful to guide intrepid transformative activist-scholars through the tough choices they must make about where, with whom and how they engage in their quests to transform the world. Political rigor uses as its departure point the acknowledgement of the inherently political and culturally and historically situated nature of knowledge production (Haraway 2003) and the observation that all research, science and forms of knowledge production are inherently political enterprises, impacted by unequal power relations. We do not in this paper shun positivistic science, rather we draw inspiration from the creative expansion of science through critiques of normal science, and critical social theories and methodologies in post-normal social science (Dean et al. 2006).

We take inspiration from Roy Bhaskar's (2016) critical realist theory of ontology, that recognises that our perceptions of reality are inherently ontological and influenced by multiple renderings or perceptions of truth. Political rigor could therefore be seen as a critical realist mechanism that is reflexive and critical of our stance of 'truth' and opens up the possibility for multiple truths (of which Bhaskar identifies four distinct forms). Here multiple pathways to truth ()can be critically and rigorously observed through understanding their ontology, epistemology and rationality- and the context that these knowledge(s) emerge and respond to. Political rigor therefore undermines our dogmatic positivistic assumption that there is one overarching truth attained through pure 'scientific' objectivity (Bhaskar 1993; Rabinow 1996; Lotz-Sisitka 2009b).

While academic rigor is ensured through the scientific method and verified through a process of peer review, there is no preconceived system of ensuring political rigor nor for navigating the potential trade-offs and complementarities between academic and political rigor; as the forms of knowledge needed by diverse constituencies will not necessarily align (Borras 2016). We thus argue that further development of a reflective and iterative framework for assessing "political rigor" can be put to use to address the tensions and synergies and challenges of activist and transformations research. This includes mechanisms more able to identify how

future research may generate findings that can inform politics and practice.

Beyond this, the development of a political rigor framework can address ways to bridge discourses between the interests and needs of social movements and academia while building trust (Edelman 2009); can expose potential contradictions, ineffectiveness and hypocrisies while supporting a political struggle (Vinthagen 2015); and can provide a critical perspective on participation and its constraints, and on the limits and challenges of developing an emancipatory research program within neoliberal academic institutions and disciplines that continue to be structured by power interests and hierarchies (Temper and Del Bene 2016, Chatterton, Hodkinson and Pickerill 2010). Finally, it can address how overburdened academics can find space for joy in reflexivity, supporting struggles and collective action amidst precarity and the pressures of the academic publish or perish rat-race.

In the next section, we offer tangible examples of what political rigor looks like in practice through an exploration of the diverse roles that researchers are adopting under the new paradigm, and how they are navigating these uncharted waters. In the discussion, we open a dialogue through a reflection on these roles and how they can inform the development of a politically rigorous praxis for transformations research.

3.1.4 Method: The Tarot Deck of Transgressive Research

In this paper we propose the tarot as a device for exploring diverse approaches to research. The Tarot is a set of playing cards, usually consisting of a pack of 78 figures or symbols which is traditionally used as a way to awaken the intuition of the reader and the "querent" as a means to improve their understanding of a situation or provide an answer to a question. The cards, divided into the minor and major arcana, represent a variety of different situations, archetypal concepts, and/or personality traits, such as "the Lovers", "the Hermit", "Death" and "the Fool", that

can be read as a language, composed of symbolic representations like notes in a musical scale, each one having a different effect on the reader of the cards (Giles 1994).

The tarot cards can thus be seen as keys which aim to unlock intuition by challenging the reader to confront symbols they would not normally consider. In this way the tarot can lead to new insights, out-of the box thinking and a new perspective. Each card or character will prompt in the reader a different interpretation and association informed by her life experiences, stories and personal narrative.

Inspired by the use of the Tarot as a narrative device, a descriptive tool, and a way for the researcher to connect with their intuition, we suggest that the tarot and its characters can be used by researchers struggling, as do we, with defining their role as scholars and activists in a transforming world in several ways. This includes surfacing and exploring their own positionality and roles as researchers, contributing to a definition of the diverse considerations inherent in politically rigorous research and helping to define the values that inform and guide their own research.

To this end, we created an exercise employing arts-based methods that invites researchers to define and explore their own roles and responsibilities and identities as scholars. During workshops held in Beirut, Barcelona, South Africa and Lund, Sweden, we invited researchers to reflect on the following key questions, and to create their own "tarot card", using a process of collage that involves selecting from symbolic images provided or ones they had gathered that speak to the research identities, tensions, questions and concerns in their work.

- What character or role do you identify with in your research/activism up to this point?
- What images surface for you when you think of your work?
- What challenges and tensions come into play when you adopt this role?

The exercise led to the creation of a space for reflexive exploration into each researcher/activist's unique and plural expressions of their roles and actions, both ideal and actual, that were generatively surfaced in this simple process. (Figure 2)

Figure 2: The Arts-based tarot exercise

In this paper we highlight seven "characters" that we have seen both within our own research communities and in critical literature, each of which embodies diverse aspects of academic and political rigor in their own way. There are obviously many more and it should be noted that these characters should be considered as emergent, flexible, and often contextually specific. We do not suggest researchers limit themselves to identifying with one "card" or the other, instead we propose that researchers use the characters presented to observe and reflect on the variety and diversity of approaches and roles that can exist in different moments throughout the research process.

3.1.5 Results: Our Tarot Deck

The Post-Normal Scientist

Figure 3: The Post-Normal Scientist

Like the fool in the first card of the tarot, the post-normal scientist is one who is venturing into the unknown, or what Sardar (2010) calls the post-normal times characterized by complexity, chaos and contradictions. She becomes what Funtowicz and Ravetz (2003) call "The Post Normal Researcher" who is aware that the paradigm of normal science and its problem-solving approach is obsolete. This character emerges out of critical realism literature (Bhaskar 1993, 2009, 2010, 2016), and out of the post-normal science canon (Ravetz and Funtowicz (ibid); Dean et al. 2006; Sardar 2010).

This researcher, navigating these conditions of transition, uncertainty, shifting power dynamics, high stakes yet urgent need for decisions, relies on tremendous creativity, imagination and acknowledgement of her own ignorance.

Regarding academic rigor, the post-normal scientist recognizes that problem definition, the choice of what gets measured and how, how values are defined and how decisions regarding this incommensurability are resolved, intrinsically entail a normative and political aspect, and require a sharp critical sensitivity to these norms.

This activist-scholar offers to a political rigor framework the need to transgress the boundaries of her own epistemic community and to reinvigorate debate among an extended peer community of "othered groupings" that bring their own diverse and situated perspectives and experiences (Salleh 2015). In this sense, the reading of the Tarot card of the Post-Normal Scientist acts as a first step; an umbrella-card of sorts, and an invitation to engage more deeply with any number of other transgressive characters in order to guide us through our journeys, including those we dive into now, for which we highlight their background, their specific contributions to a conceptualization of political rigor, and challenges that might emerge within their approach.

The Indigenous scholar / ally

Figure 4: The Indigenous Scholar

The indigenous scholar Tarot card teaches us how we can do research in culturally embedded ways and what we need to unlearn and let go of before we can do so. Indigenous communities have suffered inordinately from the "extractivist" nature of traditional research that has often imposed negative stereotypes, disempowered communities and "compiled useless knowledge" (Deloria 1973) that brought no tangible benefit back to the community.

In response, Indigenous scholars have developed decolonizing methodologies that aim to place indigenous voices and epistemologies at the center of the research process (Smith 1999; McKenzie, 2009). Importantly, as put by Tuck and Yang (2012), decolonization is *not* a metaphor: these methodologies fall under wider strategies of decolonization, which work to 'unsettle' very specific socio-historical contexts, including the indigenous scholar who prioritizes revitalizing knowledge that can be there for cultural resurgence. Makoonz Geniusz (2009) does this

through "*Biskabiiyang*" which means "returning to ourselves" to pick up the things we were forced to leave behind [like] songs, dances, values or philosophies, and bring them into existence in the future." (Geniusz 2009:49). Through *Biskaabiiyang* methodology, the researcher personally evaluates how they have been impacted by colonization, rids themselves of the emotional and psychological baggage they carry from this process, and then returns to their ancestral traditions".

Simpson also introduces two related Nishnaabeg concepts that can inform politically rigorous research. These are Naakgonige and Naanaagede'enmowin. The first means "to carefully deliberate and decide when faced with any kind of change or decision"; while the second is "the art of thinking to come to a decision" (Simpson 2011: 56-57).

Weber-Pillwax (2011:31) describes indigenous methodologies as founded on principles of interconnectedness, the impact of motives and intentions, research centered on lived indigenous experience, theories grounded in indigenous experience, research as transformative, sacredness and responsibility of maintaining personal and community integrity, and language and culture as living processes. These methodologies are embodied practices designed primarily to guide researchers in their work in their own communities and personal process of decolonization.

Naakgonige and *Naanaagede'enmowin* ask the person to reflect on a problem to figure out what needs to be done. According to Simpson, this is a rigorous culturally embedded process that requires deliberation not just in an intellectual sense but using their emotional, physical and spiritual beings as well. Similarly, the researcher should also engage body, heart and mind to evaluate the wide-ranging and long-term potential impacts of their research practices, and how their research may contribute to putting in place the transformation they would like to see in the world.

As Linda Tuhiwai Smith (1999) explains in Decolonizing Methodologies, traditional research on Indigenous peoples, or "research through imperial eyes", marginalizes the stories of the Other within a claim of universal truth. She exhorts Indigenous researchers and "other researchers committed to critique their own gaze and to rethink how their work can support alternative readings and bring forth silenced voices." Her work provides guiding questions for shaping the research process in a politically rigorous way, prompting us to consider aspects like accountability, support systems, worthiness and relevance of the study, and possible positive and negative outcomes. (Smith 1999:173)

However, according to Simpson (2011), *Biskaabiiyang* entails not just an evisceration of colonial thinking before a new research project begins; it is a constant continual evaluation of colonialism within both individuals and communities. It also encompasses a visioning process where we create new and just realities and in which our way of being can flourish. Biskaabiiyang echoes the concept of decolonization, however Simpson explains how for her it represents a way of grounding resurgence and decolonization within a "new emergence".

The Anti-oppressive researcher

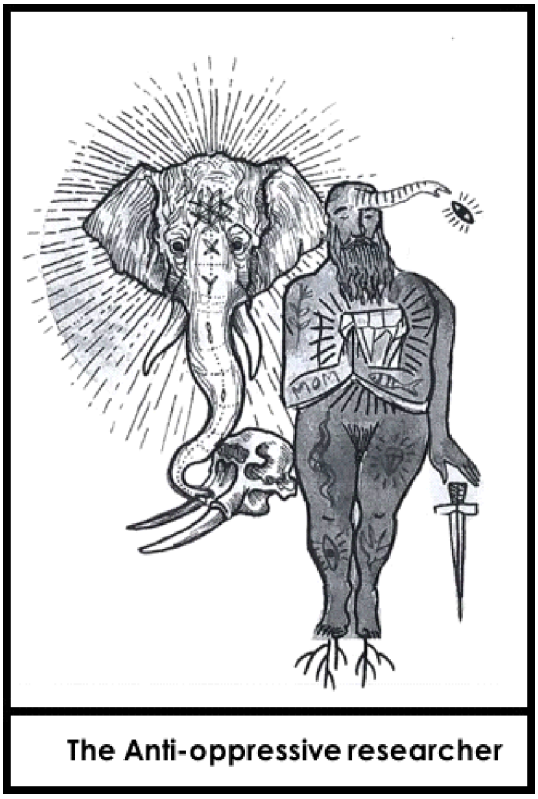


Figure 5: The Anti-oppressive Researcher

The anti-oppressive researcher responds to calls from environmental justice groups and critical academics to investigate and resist oppressive social systems at the root of the current ecological crisis (Plumwood 2002, Di Chiro 2008, Walia 2014), including their manifestations within academia and dominant processes of knowledge production. (Strega & Brown 2005). This Tarot card can help guide scholar-activists through positionality and power relations within research processes, prompting them to center interpersonal relationships, reflexivity, the question of whose interests are served by research outputs and design and whose are not, and the identification of the research process itself as a site for resistance and transgression.

Anti-oppression as a theoretical framework stems from anti-oppression discourse and practice within the field of critical social work, which highlights difference and

diversity of human experience as an attempt to avoid reproducing harmful structures of power, exclusion and marginalization (Brown 2012). Derek Clifford (1995), inspired by Black feminist thinking, argues that an 'anti-oppressive' practice would be one that focuses on manifestations of racism, classism, sexism, and other forms of discrimination in interpersonal or organizational interactions where concentrations of rewards and services go towards powerful groups, while considering social divisions like race, gender, class, disability, age, and sexual orientation as connected to broader social structures.

The anti-oppressive researcher pays particular attention to the shaping of the research agenda, examining who is and who is not involved in picking the topic, whose interests are served and whose are not, and what is and what is not explored. By constantly asking questions, the researcher seeks to bring to light the assumptions about people, power, knowledge and relationships that they hold, thereby identifying how power relations shape the research process. This attentiveness allows a reconceptualization of research as an emergent process, not a linear, predetermined one. An anti-oppressive researcher sees themselves as both oppressor and oppressed, depending on the context, and considers that in order to challenge power relations in knowledge production, one must also challenge the dominance of current paradigms of research. (Potts & Brown 2005).

Drawing from Indigenous theory, feminism, critical race theory, Marxism, poststructuralism, and postcolonial thought, anti-oppressive research (AOR) can act as one strategy to challenge toxic social relations via knowledge production processes (Potts & Brown 2005). The framework demands methodologies that resist dominant interests and powers within and outside of academia, centering reflexivity and consent (Strega & Brown 2005) and should avoid both essentialism and subjectivism (Brown 2012). In this way, AOR acts as an intervention; a way for researchers to ask questions, seek answers, and develop new questions all while focusing on relationship-building (Potts & Brown 2005).

One potential pitfall of the anti-oppressive researcher is the over-simplification or generalization of experiences of oppression and power based on pre-set identity categories, even when using an intersectional lens (as proposed by Kimberlé Crenshaw in 1991). They also risk becoming so focused on disrupting and opposing the status quo that they fail to critique new normalizations and power structures emerging within their opposition.

The Co-Conspirer

Figure 6: The Co-Conspirer

The Co-conspirer is an activist that conducts research to enrich the justice movement that she is specifically immersed and implicated in. She seeks to amplify the knowledge held in marginal spaces that sits outside of the hegemonic meaning-making machine (Kulundu 2016; Kulundu 2018). She collaboratively struggles to understand the concerns, challenges and transgressive practices of those that she is bound with in solidarity in their quest for emancipation. She conspires with those in the fringes of society with the intention of building a

counter-hegemonic expression and practice that emerges from their epistemic beliefs and ontological yearnings of those that she is in solidarity with, and she struggles with others to build on the emerging language and practice (Kulundu 2016). This way of working believes that without a flourishing understanding of who we are, we lack the epistemological roots to guide or trace our way forward.

The Co-conspirer works to help regenerate and reproduce the collectively imagined and desired emancipation of those she is working with. She takes careful and incremental ontological steps with the collective to build creative and revolutionary praxis. She sees imagination as a key tool in shifting dominant hegemonic discourse (Smith 1999:39) as she understands re-imagining processes as not just a re-thinking of how one sees the world; but expanding our way of being by opening ourselves up to alternatives and bringing these alternatives to life through our writing, our art making and our performance.

In particular, the co-conspirer raises concerns over the discarding of human embodiment of the environmental imaginary and she encourages an embodied ecological citizenship, that attends sufficiently to body, place, and politics, especially as these are understood as different modes of engagement with the world within history (Reid and Taylor 2000: 440). Like the trickster, personified as the jackal in many African stories, she is able to move between worlds with ease, in this case the existing hardened socio-economic and political histories that we respond to daily, while maintaining a deeply connected and sensorial relationship with the wider natural ecology. She responds to the cultural and political "body-blindness" we see in technocratic environmental responses connected with the disparagement of local knowledge and personal forms of knowing and capacities not only in the policy system, but also in education and even in the larger environmental movement (McGarry 2013). The co-conspirer challenges body-blind, non-dualistic understandings of the individual within a matrix and subject/object dualisms, and connects this to democratic freedom (Reid and Taylor, 2003)

She is sensitive and observant to surface native meanings from what we might think is routine and mundane and reveals the innate knowledge that colors it (Fricker, 2007). She understands that erotic knowledge (i.e. embodied, intuitive and instinctive ways of knowing) (Lorde 2007) of this nature is a vital resource; it is cultural capital that holds power that grows as it is consistently surfaced and acknowledged as knowledge, and sees this knowledge as a 'hermeneutical resource' (Fricker 2007: 155). The co-conspirer opens up what Homi Bhabha calls the generative 'third spaces' that go beyond dominant discourses and binaries in educational research, and draws from phenomenological and sensual renderings of the world (Merleau-Ponty, 1968, Cobb, 1977; Abram, 1988, 1996). This phenomenologically shaped third space generates new possibilities by questioning entrenched categorisations of knowledge systems and cultures and opens up new avenues with a counter hegemonic strategy (Breidlid 2013: 626).

The co-conspirer is implicated in the movement/action and so needs to maintain a healthy connection to her own identity and autonomy. The co-conspirer also might find that she can get lost in the generative emergent processes of the group and should strike a balance between lifting out erotic knowledge systems (Lorde 2007:59) and personal agency with the need to transfer these knowledge(s) into collective actions and agency (Kulundu 2018). The Co-Conspirer might be overwhelmed with emotional, traumatic or difficult forms of knowledge that might emerge from her transgressive practice and she must be able to find psycho-social support when necessary to hold and recognise these emotionally complex knowledge(s).

The Responsible Participant

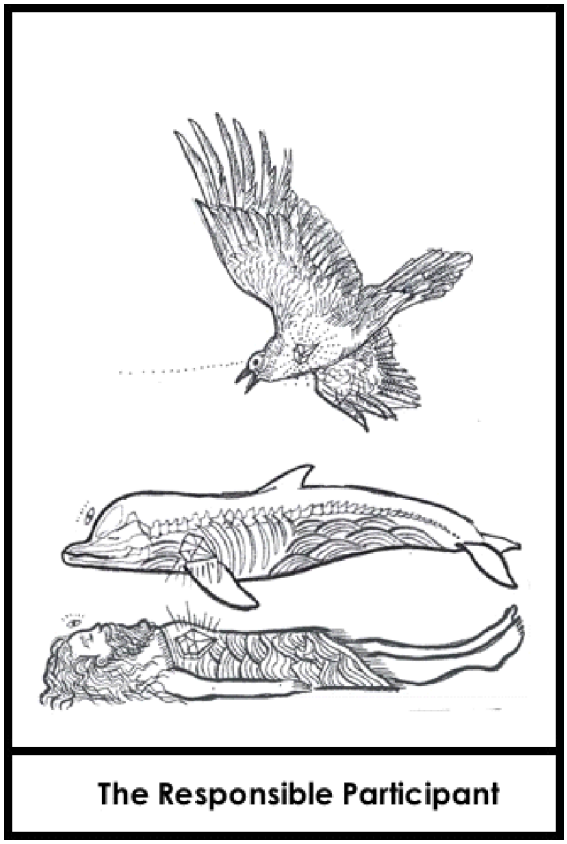


Figure 7: The Responsible Participant

The Responsible Participant strives to participate in and hold a transformative and connective social space, that is cognizant of parity, inclusion, reflexivity, empathy and intuitive imaginal thought (McGarry, 2013; 2014), and that disrupts hegemonic or 'taken-for-granted' social forms of engaging. The Responsible Participant - originally coined by Shelley Sacks (2011) - refers to the researcher as reflexive practitioner/intervener/facilitator in an emergent research process rather than the dominant force controlling the shape of the process.

The Responsible Participant aims to remain present, by being present with her own senses and sensibilities (see Otto Scharmer 2007 in working with the concept of 'presencing' as part of his "U-theory"). In this way she becomes an apprentice to her own intuition, imagination and empathic capabilities, as well as an apprentice

to the participants' ontologies that she is working with (McGarry, 2014). She ensures that the pressures of moral imperatives do not govern her praxis alone, but rather her personal ability to act in an intuitive, reflexive and caring way, which guide her participation beyond a basic commitment to do-no-harm (McGarry, et al, 2017). As Social Development practitioners and authors of 'artists of the invisible', Kaplan and Davidoff (2014) quote Rudolf Steiner's (1995) insistence of an 'intentional wakefulness' that ensures they are vigilant in avoiding strengthening the very patterns and behaviors that they have set out to change.

A primary aim is to reduce the power of the researcher as facilitator and to avoid the facilitator's potential capacity to manipulate - or what Chambers (2009) calls *facipulation* (manipulated facilitation). This character calls for sensitivity to the tyranny of participation (Hickey and Mohan 2004) by relying on generative and accessible facilitative forms, such as connective aesthetics (Gablik 1992) and/or social sculpture methodology (Beuys 1977; Sacks 2011; McGarry 2013). The Responsible Participant sees the aesthetic as the opposite of anesthetic (Benjamin, 2008; Buck-Morss 1992; Sacks 2011). The aesthetic is therefore an enlivening, sensorial and awakening force that can create spaces of extra-social authority that exist outside of a human being, and within a collectively agreed upon culture of engagement around a central connective image/space or a sculptural object.

Through a combination of internal and social reflexivity, the Responsible Participant is able to navigate their power and thus to hold the learning/transgressive space on the behalf of the whole, allowing the researcher to participate in a more equitable (less-dominant) form in the learning/exchange. McGarry (2013, 2014) highlights the potential for this approach in collaborative practice-based research for developing methodologies and pedagogies for embodied ecological citizenship (Reid and Taylor 2000).

We have also seen the Responsible Participant as responsible for carefully disrupting normative absences through applying disruptive pedagogies that lift out

the systemic causes for significant ills plaguing a group or a community. A simple example is removing the waste bin from a household which removes the possibility to have a place to throw away and therefore absents waste, which could lead to generative new possibilities of avoiding waste. In the same way the Responsible Participant is constantly collaboratively seeking out ways to absent the "absences" (Bhaskar 2016) inherent in driving many of our daily social and environmental problems.

The Responsible Participant needs to avoid becoming over-reliant on exercises, procedures, games, models and frameworks that she uses in her repertoire (Kaplan and Davidoff 2014: 4). While these instruments are useful for engendering participative thinking and action, they should not be dogmatically applied to all manner of situations as techniques that must always resolve both our social and ecological dead-ends (Chaves et al, 2015), there are many subtle and nuanced paradoxes that come with being human (Kaplan and Davidoff 2014: 4) and she should find a balance between the instruments/processes she uses with their intuitive, empathetic and imaginal reflexive capacities, that allow for innovation and emergence.

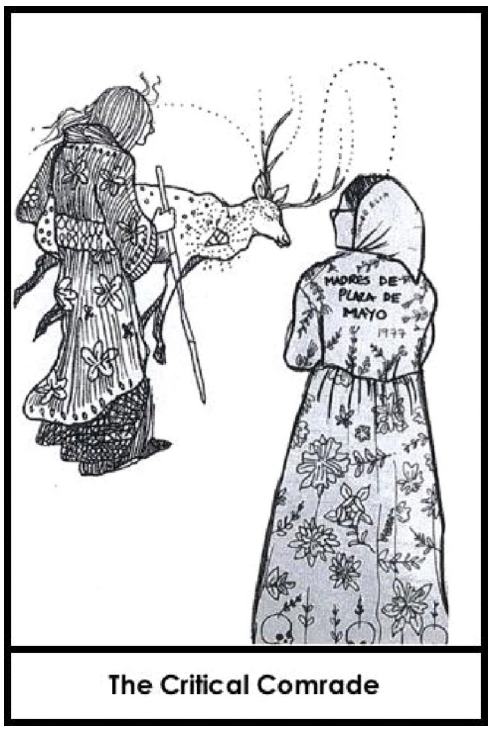


Figure 8: The Critical Comrade

The critical comrade is a character that allows us to think through and deal with both the synergies and potential tensions that may arise when juggling the dual roles of movement activist and professional academic / researcher. The critical comrade is committed to help generate knowledge which would be useful to social movements from below, however she acknowledges that while the collaborations between scholars and activists can be immensely fruitful, they can also be knotty and problematic and loyalties to both aims may conflict as there can exist significant differences in objectives, outputs and time frames. For example, activists often need to take decisions urgently and hope that academic research will be able to inform struggles in the moment; they can be unaccustomed to the slow pace of meticulous research. Other tensions entail the researcher's propensity to probe which may entail asking uncomfortable questions and lead to frictions, either because of a lack of delicacy; insufficient relationship building; or because of a hesitance to engage with difficult questions within the movement.

Every academic invested in social movement struggle continually needs to question how her research will be used to advance the cause or how it may be wielded politically – this is what we term the political impact and rigor of research. As Edelman (2009: 249) points out this leads to the need to avoid on the one hand an approach "which in its more extreme manifestations critics sometimes characterize as 'self-censorship', 'uncritical adulation' or even 'cheerleading'" and on the other to make sure that the research does not unwittingly strengthen the analytical capabilities of repressive forces, state surveillance, elite interests, or other hostile opponents, providing fuel against the movement and leading to divisiveness. Perhaps the most challenging for the engaged researcher is to find the way to be critically constructive, and to offer analytical and theoretical insights that can enrich the movement. In this, the critical comrade must rely on his own judgment as well as on a form of peer review that takes place through a dialectical process of debate, joint analysis, strategizing and discussion within movement spaces

As Bond (2015) writes , "To fail to offer critical perspectives on movements against power is as serious an intellectual flaw as suffered by so many of our colleagues who write uncritically about the status quo, succumbing to flatteries gained by serving power". Bond elaborates 10 sins that sympathetic academics must avoid when working alongside social movement agents, these include hijacking, in which a researcher takes ownership of a movement and its interpretation; **substitutionism**: whereby the researcher replaces local understanding with his own vision; **Ventriloquism**: re-phrasing of movement texts in his own (academic) words; **careerism through parasitism**: technicism, hucksterism, divisiveness, and betrayal. Within this the cardinal sin is perhaps "**Failure of analytical nerve**: inability (often due to fear) to draw out the fully liberatory potentials of the movement and its struggles or offer comradely critique of those movements ." In this line, Edelman (2009) points out that one of the most productive contributions of researchers can be to identify exclusions and imbalances or organizational patterns through candid discussions with potential

members who feel alienated, uninvolved or disaffected. Such insights that may be difficult to identify from within.

The Queer Enquirer

Figure 9: The Queer Enquirer

The Queer Enquirer sees opportunity for resistance in every step of the research process, using their position at the margins to creatively challenge hegemonic norms present in research institutions.

Queer theorist Fairn herising (2005) proposes the possibility of ex-centric research and queer flexibility as one way to respond to calls to challenge current dominant research paradigms. An ex-centric researcher uses their research process to disrupt the academy's exclusion of marginalized voices by centering subjugated knowledges and advocating for their epistemic value, while queer flexibility implies an on-going opposition to the status quo by challenging the idea of identity as static, and provides for transgressive methodologies that can be used as tools to

disrupt hegemonic, normalized, and naturalized structures within academia. Through a lens of ex-centricity and queer flexibility, methodology becomes a radical strategy of resistance while adding transformative possibilities into a researcher's toolbox (Ibid.)

Queer Enquirers reject binaries and recognize the value of experiential knowledge. They build and imagine alternative worlds out of necessity and center the concept of consent as active and enthusiastic. Just as there are many more ways to love and express ourselves than the options presented to us as children, Queer Enquirers know there are limitless alternatives to normative scientific research. While underlying values, ethics and standards exist, there is no one 'right' way to be a researcher. They notice similarities between the punishment, exclusion, and severe pressure to conform to normative gender and sexuality (Elia 2003) and the risks faced by scholar-activists (Flood et al. 2013) who fall outside of the 'charmed circle' (Elia 2003) of 'acceptable' academic behavior.

These researchers "advocate for humane, equitable change and conceive of ways research, texts, and bodies can serve as sites of ideological and discursive 'trouble'" (Burlington & Butler, 1999; Munoz 1999; Solis, 2007 in Adam and Jones 2011 p 110). However, they must avoid the traps of whiteness, elitism, and coloniality associated with some discourses around Queerness (Adam and Jones 2011, Haritaworn 2008, Elia 2003), and should constantly seek to avoid (re)creating hierarchies within heterogeneous marginalized groups.

Queer Enquirers see knowledge production as a performance, with the potential to both perform the world we live in as well as the world we *might* live in. (Gibson-Graham 2008). Through embracing the transgressive potential of the latter, Queer Enquirers engage in imaginative processes of activism (Hwang 2013) that seek to open new possibilities and support the building of alternatives (Gibson-Graham 2008).

The Slow and Care-full scholar

Figure 10: The Slow and Care-full scholar

The slow and care-full scholar seeks to create spaces for care and caring relationships amidst the demands of the neo-liberal university that tends to devalue such relations and practices (Mountz et al 2015). She resists these demands by prioritizing well-being, including one's own, in a space that would see the researcher primarily as a source of labor, and those she engages with in research processes as subjects to extract from.

This scholar rejects the dehumanization of herself and others, embodying an ethics of care that directs attention towards the most vulnerable amongst us. This can include our own students, anonymous scholars seeking critically constructive revisions, or adjuncts and teacher's assistants who are struggling with precarity. It may also include ourselves, and the challenge becomes how to engage in these relations of care while also practicing "self-care", being cognizant that "care work is work. It is not self-indulgent; it is radical, necessary and risky, imposing a

burden on those who undertake it." (Ahmed 2014). Or to be even more provocative in Ahmed´s words (2014) echoing of Audre Lorde (2007), "self-care is also warfare" for those whose self-preservation acts as a form of resistance against a neoliberal system that threatens their very existence.

The slow and care-full scholar advocates for slowness not just as a form of resistance but also as a way to improve the quality and depth of scholarly material. Instead of rushed, superficial readings and interactions, she engages deeply and care-fully with texts and her research communities, taking time to think, consider, critique, and create (Mountz et al 2015).

Care means accepting and embracing failure, it entails guarding against self-exploitation of care work and strategies to respond to the dictates of academic orthodoxy and success. It can mean a process and labor of creating new metrics and fostering a culture of appreciation for collective authorship, mentorship, collaboration, community building, and activist work in the germination and sharing of ideas and for convivial resistance to the current models of knowledge production. As Mountz et al (2015) explain, "Care-full scholarship is also about engaging different publics...refining or even rejecting earlier ideas, engaging in activism and advocacy, and generally amplifying the potential impact of our scholarship rather than moving on to the next product that "counts" to administrators."

The heroine who rejects the conformity and the metrics of the neoliberal university and focuses instead on relations of solidarity and a revalorization of marginalized caring activities inevitably faces a struggle to thrive and flourish within the university (Kronlid 2009). In response she actively continues to remake the university, to at least name and acknowledge the power hierarchies she may be unable to confront (Temper and del Bene 2016), and to avoid academic 'counting culture' that breeds institutional shaming and self-audit, instead counting friendships, collaborations, and thank yous (Mountz et al 2015).

The slow and care-full scholar might become so focused on care, however, that they become averse to the challenges, frustrations, and risk-taking often necessary to move through complex research processes.

3.1.6 Discussion: Political rigor

Perhaps one or several of the archetypes included in this paper rang true to you, or, perhaps you would identify with a very different approach and would want to add your own character to the growing tarot deck of transgressive research. These characters are intended to prompt an ongoing conversation, inviting us to consider how we see our scientific practice, our engagement with other agents within the process of research, how values are reflected in the work we do, and how we sense that research leads to social and political change and transformation.

The Tarot exercise is just one example of a tangible strategy to open up space for individual and collective, collaborative reflexivity in our research communities. This exercise is a way to explore our own positionality and can be used as one piece in a more comprehensive effort to be more intentional in our research and activism practices. It also aims to awaken ourselves to the other senses that come into play in our research practices, including our bodies, our emotions, and our intuitions.

In this way the tarot serves as a device and an entry point for exploring the "political rigor" of our knowledge practices. By drawing out key aspects of diverse transgressive research approaches, some of which we include in this paper, we can begin to give shape to this concept and how it can be applied.

Similarly to how scientific rigor can be defined as the application of the scientific method to ensure robust experimental design, methodology, analysis and reporting of results, we define political rigor as the application of methods of reflexivity in

knowledge creation through which power relations and explicit values and aims of societal transformation are identified, reflected on, socialized and evaluated among an extended peer community, and reflected in the research design, methodology and research outputs.

If the methodology of the scientific method ensures the reliability and robustness of results for scientific rigor, for political rigor, a process of radical, intentional and inclusive reflexivity is what ensures accountability for the practical and political outcomes of the knowledge creation process. While scientific rigor uses peer review as a means of verification, political rigor is verified through an iterative cycle of political peer review.

Like scientific rigor, political rigor also entails substantiating assertions, referring to sources and broader literature and discussions, distinguishing between facts and interpretations, but does so through a lens of power analysis, rejecting neutrality and false objectivity, and purposefully seeking out those voices often excluded in dominant science. In this way, political rigor uses scientific rigor strategically as a counter-hegemonic tool. In this way scientific and political rigor can be synergistic. While tensions surely exist, these are approached through being explicit and intentional with our biases and aims and clearly positioning ourselves. Political rigor makes space for the existence of multiple truths and uncertainty, but not uncritically. Above all, political rigor is fluid and heavily dependent on context.

Political rigor involves embedding active, strategic reflexivity into every step of the research process and entails social evaluation of the research among an extended peer community. It is process-oriented, not outcome oriented. It is a key consideration in a new knowledge praxis and includes consideration of epistemic justice (Fricker 2007; Temper and del Bene 2016), that may be defined as the valorization and recognition of other forms of knowing and other life-worlds, including knowledges “From below, to the Left, with the Earth” (Escobar 2016).

We aim to develop further tools such as the Tarot process for evaluating political rigor and for guiding reflexivity so as to assess the consequences of the research and how these fit into our values, objectives and broader transformative visions. We may ask of research intended for social transformation: “Research for what? With whom? How? What kind of change? How in practice will this production of knowledge transform power relationships?” Such a critical politically rigorous reflection would include consideration of the ontologies (what is truth?), epistemologies (what is the connection between the knower and what is or could be known), methodologies (how do we set out to create and discover knowledge) and axiologies (what is essentially valuable and important) that inform the research process (Guba and Lincoln 1996, Vargas et al 2019). It includes a constant interplay and dialectic between action and reflection, often referred to as the praxis of research (Freire 2000).

Questions to be examined include those on the transformative aims and desired political impacts emerging from the project, methodologies, explorations into the meaning and forms of participation, solidarity and reciprocity in the research, questions of relations with co-researchers, authorship and acknowledgment and enquiries into the sources of knowledge and attention to who is considered an expert, what forms of knowledge are valued and which are marginalized? What are our research publics and outputs - who are we speaking to and how in what forms? And how do we evaluate ourselves and seek evaluation from others?

Beneath all this is the question of the values and the criteria that inform the research. Here, based on our own experiences and those of others in our research communities, we propose some principles that frequently emerge in a *‘political’* peer review process. These are principles that have been reflected through the tarot characters that we have just described which we suggest can act as guides in how some researchers apply these values in their own work. Thus the slow and careful scholar reminds us how to care and how to deal with the blurring of our personal and professional lives and the indigenous ally may teach us what reciprocity might

look like even towards our non-human plant and animal research partners.

While these are values which have emerged here, we suggest each researcher to work together with their co-researchers and participants to jointly define the values and criteria that inform their own collective and individual processes.

We consider that a political peer review process can include the joint definition of shared values and principles, along with co-development of means to verify their application and integrity, and the outlining of an iterative process for adjusting the research design, process and outcomes to ensure them. This is akin to the dialectic interaction of theory/reflection and practice and action involved in transformative and action research.

- ***Accessibility*** (research can be understood broadly and a means for social learning)
- ***Reflexivity*** (critical examination of our own practices, presumptions and assumptions and the power relationships in our work).
- ***Relevance*** *(co-defining Matter of Concern* with all involved. Research must be useful to emancipatory efforts of groups we work with)
- ***Transparency*** (clarity of structure, processes and outcome)
- **Care-full ness** (relations of care with oneself, loved ones, communities of scholar and participants)
- ***Respectfulness*** (how are other forms of knowledge and worldviews valorized, recognized and integrated into the research process)
- ***Relationality*** (research should be grounded and context dependent)
- ***Reciprocity*** (co-design of research question, methods, analysis and outputs works as one method to help ensure reciprocity)
- ***Fallibility*** (possibility to fail and learn from failure)
- ***Transformativity/Transgression*** (how is the research transforming power relations and transgressing practice as usual to open up new emancipatory possibilities).

Adherence to such values can help inform scholar-activists in a collective process of creating transformative knowledge, that is sensitive to the politics of co-production and how politics, interests, imperatives and knowledge of different actors and stakeholders are reflected in the final research. The new transformative knowledge paradigm demands such a newer deeper form of radical reflexivity that is in the making.

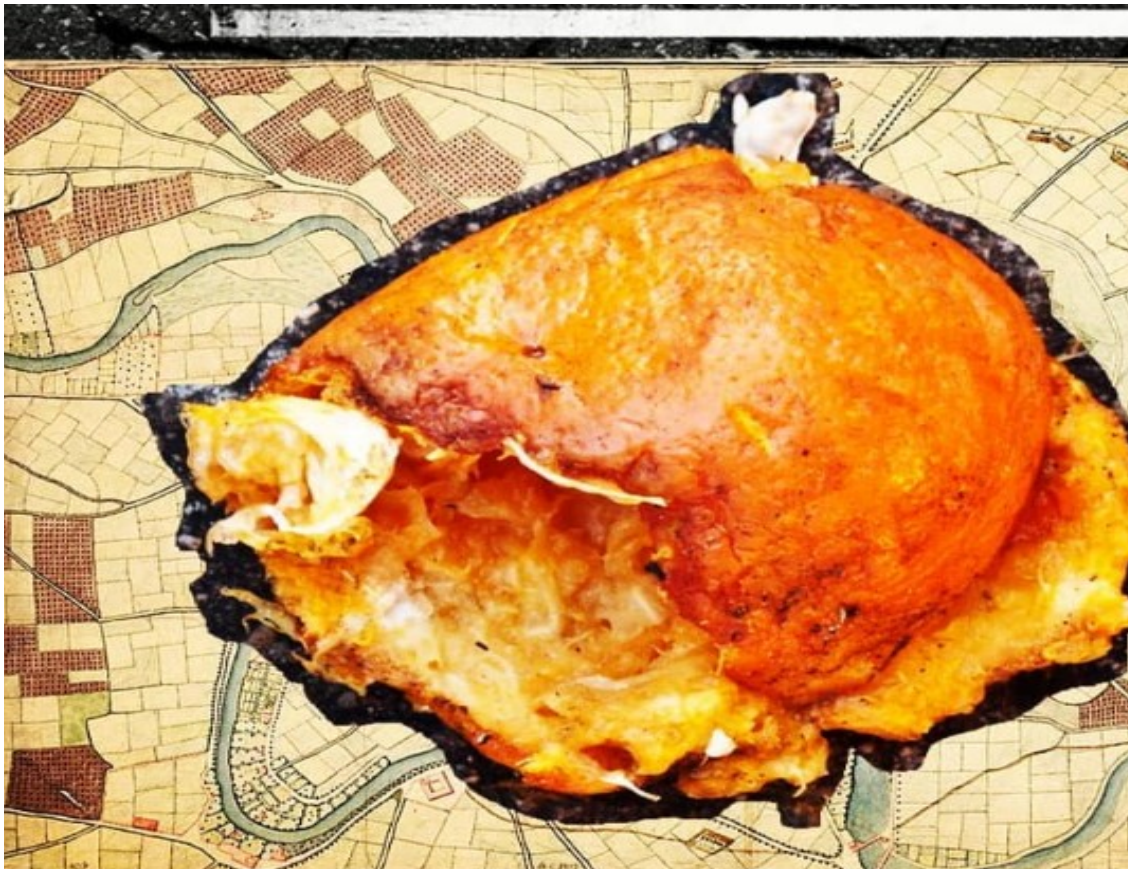
3.1.7 Conclusion

This paper has presented a variety of approaches that transgressive activist researchers are engaging in, directing the reader to references and literature on each and has forcefully argued for the need for political rigor informed by explicit values as a complement to academic and scientific rigor within a new paradigm of scientific quality for transgressive and transformative knowledge production and science. By identifying commonalities across diverse critical and emergent approaches to science, this paradigm helps us move towards more coherent methodological approaches in transdisciplinary sciences like ecological economics that have struggled with uncritical plurality and methodological confusion (Dow 2007, Spash 2012).

Our future research agenda in this line includes the elaboration of other tools, disruptive practices/pedagogies, games and exercises that can help guide a reflective process of political rigor. This process includes ongoing individual reflexivity, but also a collective exploration into the politics of knowledge and the thorny work we must do of complicating standard academic protocols and the transformation of the institutions we work in; and of how we produce and value knowledge production. In this vein, we must constantly ask ourselves and others, “how is this work transgressive? (Lotz-Sisitka, 2016) How are we upending, challenging and questioning the assumptions, the dualisms, the anthropocentrism and objectification of traditional academic knowledge? Finally, how do we see our

research as a process of becoming, and transformation rather than an uncovering of existing truth? We hope this paper contributes to opening up further space for discussion on how science needs to transform itself and serves as a vehicle for critical reflection for researchers redefining themselves and their work.

3.2 CHAPTER TWO



Critical Cartography. Digital Collage. 2020. Lena Weber.

Chapter 2: Transforming the Map? Examining the Political and Academic Dimensions of the Environmental Justice Atlas

3.2.1 Introduction

Environmental justice activists, academics and activist–academics grapple daily with how to conduct politically sound theoretical work and theoretically sound political work on a topic that is both a field of study and a social movement

(Temper and Del Bene 2016). The term ‘environmental justice’ was born in Black and Latino communities in the United States in the 1980s, as they resisted the disproportionate pollution they faced compared to white communities due to the placement of waste disposal facilities and industries. Later, it took the form of an analytical frame useful in understanding how different factors, including race, class, gender and age, shape unequal distribution of socio-environmental costs. More recently, environmental justice, both within academia and social movements, has been ‘globalizing’, increasingly gaining in popularity and being employed as a common frame of understanding across diverse contexts, as well as a way to make visible the global dimensions of local environmental conflicts (Temper et al. 2015).

This chapter examines how political and academic goals and aspirations converge and sometimes conflict in the creation of a global-mapping project dedicated to charting this global movement for environmental justice through a database of place-based movements of environmental defense—The Environmental Justice Atlas or EJAtlas. Maps have often been used as a tool by environmental justice scholar–activists in their political and academic work (for example, the Atlas of Radical Geography), though they tend to focus on individual or localized cases of environmental injustice, often in urban contexts. Like other environmental justice maps, EJAtlas was designed as an advocacy and policy tool, but with the global scope of its mapping and database, it has also become a platform for international networking and scholar–activist analysis.

Academics who are also activists, or who engage closely with social movements, have frequently discussed the often messy relationship between research and politics. From Freire’s (2000) work on emancipatory praxis to rich bodies of literature by critical race theorists, feminists, queer theorists, indigenous scholars and others, scholar–activists often question how to balance the academic and political motivations and dimensions of their work (Borras 2016, Temper et al. forthcoming). Many scholar–activists might feel they have ‘dual loyalties’ (Hale 2006) to both their academies and a political cause or social movement.

Environmental justice work, as both a movement and a body of theory (Martinez-Alier et al. 2014), must be particularly aware of these tensions, as it simultaneously takes place and develops on the streets, in the mountains, in the classroom, by our rivers. Regarding the EJAtlas, its main concern is how it can be used as a tool for and by social movements, against state and corporate interests, while maintaining high academic quality.

Based on survey data from visitors to the EJAtlas website, as well as feedback received via other means, this chapter reflects on the Atlas as an example of co-produced knowledge and 'public political ecology' (Osborne 2017). It looks at who is using the Atlas and why, and at tensions and complementarities between academics and politics that arise as we attempt to map environmental conflicts for transformative goals. We, the authors, have spent years directly working with the EJAtlas, and are currently one of the co-directors and founders (Leah Temper), the coordinator (Daniela Del Bene) and a doctoral candidate both studying the Atlas and assisting with its continued development (Lena Weber).

To do so, we first discuss political and academic dimensions of environmental justice work, explain the birth, growth and objectives of the EJAtlas, and describe the data gathering and documentation process used by the EJAtlas to map out environmental conflicts and resistance. Then, we lay out our methodology for examining how diverse actors across the globe contribute to and use the Atlas. In the resulting analysis, we examine illuminating examples of who uses the Atlas and how they use it; we also examine questions around the visuals of mapping, including accessibility and politics of representation. Finally, we discuss academic and political challenges and opportunities presented by the EJAtlas, and the tensions between the two, before briefly concluding with a note on the transformative potential of the data contained in the Atlas.

3.2.2 But Wait, What's the Atlas?

A group of researchers at the Autonomous University of Barcelona came together in 2010 as part of a new large-scale initiative to investigate conflicts surrounding waste disposal and resource extraction in collaboration with social and environmental movements around the world. In order to systematize the information gathered about these environmental justice conflicts, the group, as part of the international EJOLT project, developed an online mapping tool called the Global Atlas of Environmental Justice, or EJAtlas (Temper et al. 2015). The Atlas maps cases of local resistance to economic activities that pivot environmental impact as a key grievance via input from diverse academic and non-academic contributors from around the world (ibid.).

Grounded in theory around how power inequalities spark environmental struggles (Porto and Pacheco 2009 in Temper et al. 2015), a long history of activist-led environmental justice theory building, and the need for more engaged, collaborative activist-academic knowledge production and analysis of environmental conflicts on a global scale, the EJAtlas aimed to open up opportunities for political ecology to move beyond case studies to a much broader, systemic analysis. The Atlas aimed to respond to critiques that environmental justice literature within academia tends to be theoretically weak and disperse (Holifield, Porter and Walker 2009 in Temper et al. 2015).

Launched once it reached a thousand cases, the EJAtlas is constantly growing, with 2,600 cases mapped as of November 2018. It receives almost 2,000 unique visits daily, and has hundreds of contributors, with information on conflicts dating back as early as first contact with colonisers. Since its launch, the Atlas has received almost three million page views by over one million users. The platform also includes featured maps, which are maps that draw attention to a particular topic or region, and that makes sense of the 'dots' on the map. Conflicts are, in fact, not stand-alone processes, but are closely tied with a whole chain of production,

transportation and consumption of goods and services.

When writing this chapter, the two projects currently coordinating the EJAtlas were the Environmental Justice (ENVJustice) project and Academic–Activist Co-Produced Knowledge for Environmental Justice (ACKnowl-EJ) network based at the Institute of Environmental Science and Technology in the Autonomous University of Barcelona. These projects actively add to the Atlas and seek out contributions from specific regions of the world in an effort to grow the representability of the database. In this sense, the Atlas is not an organically crowdsourced project—though, of course, organic contributions do take place—but instead, it is an invited collaborative mapping process with exact methodologies changing from region to region. An article by EJAtlas founders (Temper et al. 2015) describes in more detail the data collection methodology, but it is important to note that contributors must demonstrate a solid knowledge of the case and context. In five years, the EJAtlas has engaged around 500 unique contributors from more than 100 countries.

The EJAtlas uses a 'North'-oriented world map projection with conflicts depicted as small points, coloured differently depending on the overarching conflict category they correspond to.

Figure 11 (top): Coloured conflict points on the map. Figure 12 (bottom): The legend for each color and the type of overarching conflict category it corresponds to.

When users click on a point, a small window opens with the conflict title and the first few lines of the conflict description.

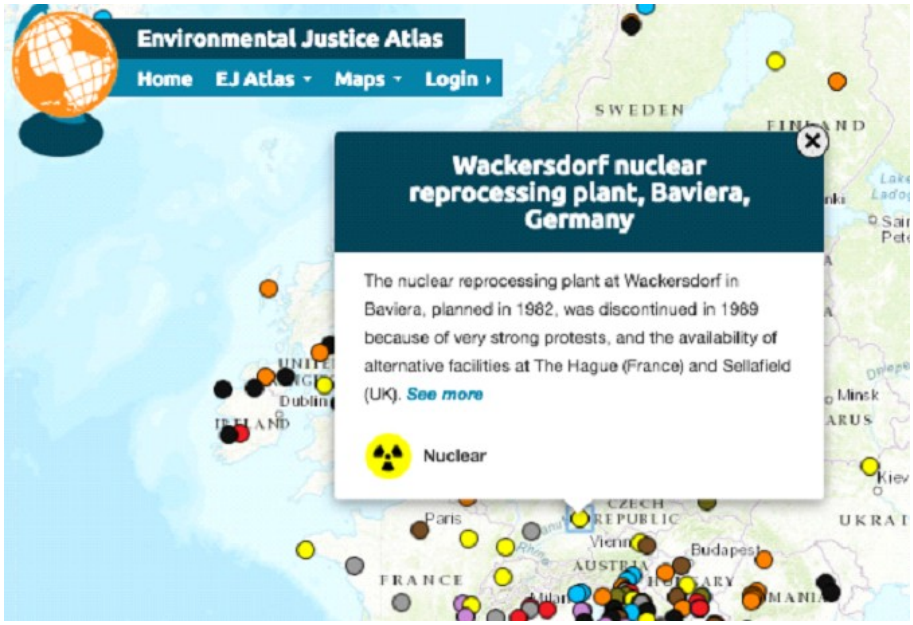


Figure 13: Pop-up description of individual conflict points.

By clicking ‘see more’, the map zooms in and isolates the selected conflict, with a side panel containing images and all the information input about the case, which can be scrolled through.

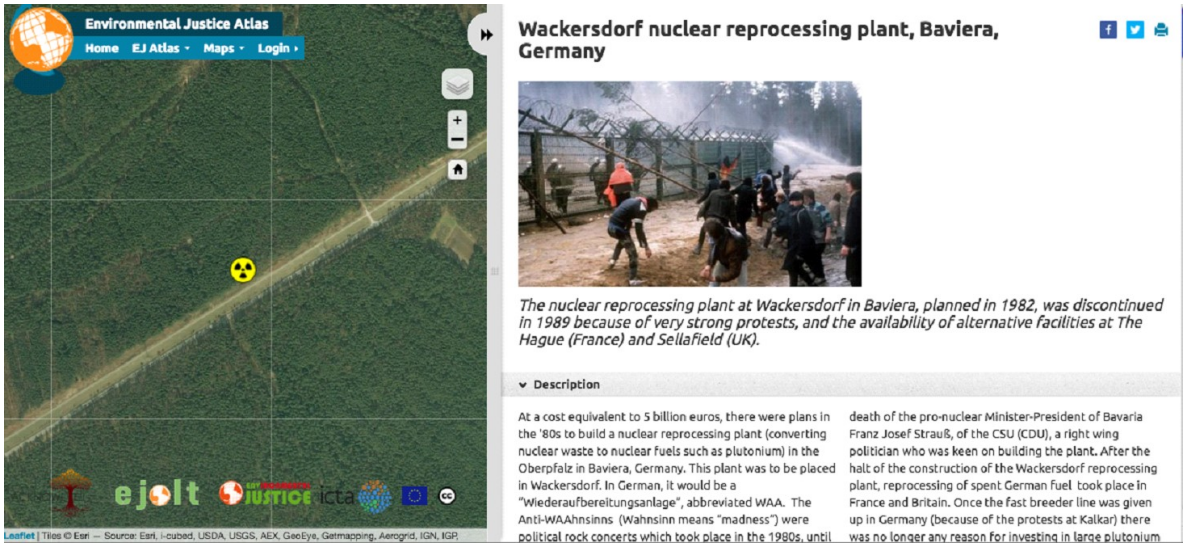


Figure 14: Side panel full description of conflict point.

Featured maps go beyond conflict points to also include vector data, which can visually be turned on or off by the user, showing detailed information when clicked upon. These maps, often stemming from petitions from Environmental Justice Organizations (EJOs) or mixed academic–activist groups, also include a basic analysis of the political economy and political ecology that links together a group of conflicts and are produced with specific goals in mind (to use as a campaigning tool, for example, by an EJO). Recent examples include the Global Gas Lock-in, a map developed by activists working with London-based Gastivists and Barcelona-based Observatori del Deute en la Globalització (ODG) to make visible resistance and conflict related to Europe's plans to grow a massive web of gas infrastructure, even while claiming to embrace policies centered on sustainability and renewables. Another example is Mujeres Tejiendo Territorio, a map developed with the Latin American Network of Women Defenders of Social and Environmental Rights and the Colombian NGO CENSAT Agua Viva—Friends of the Earth Colombia to make visible Latin American women's resistance to mining and their work in defense of life, dignity and territory. Below, images show visuals of clickable vector layers on a featured map called Fracking Frenzy, produced in collaboration with Friends of the Earth.

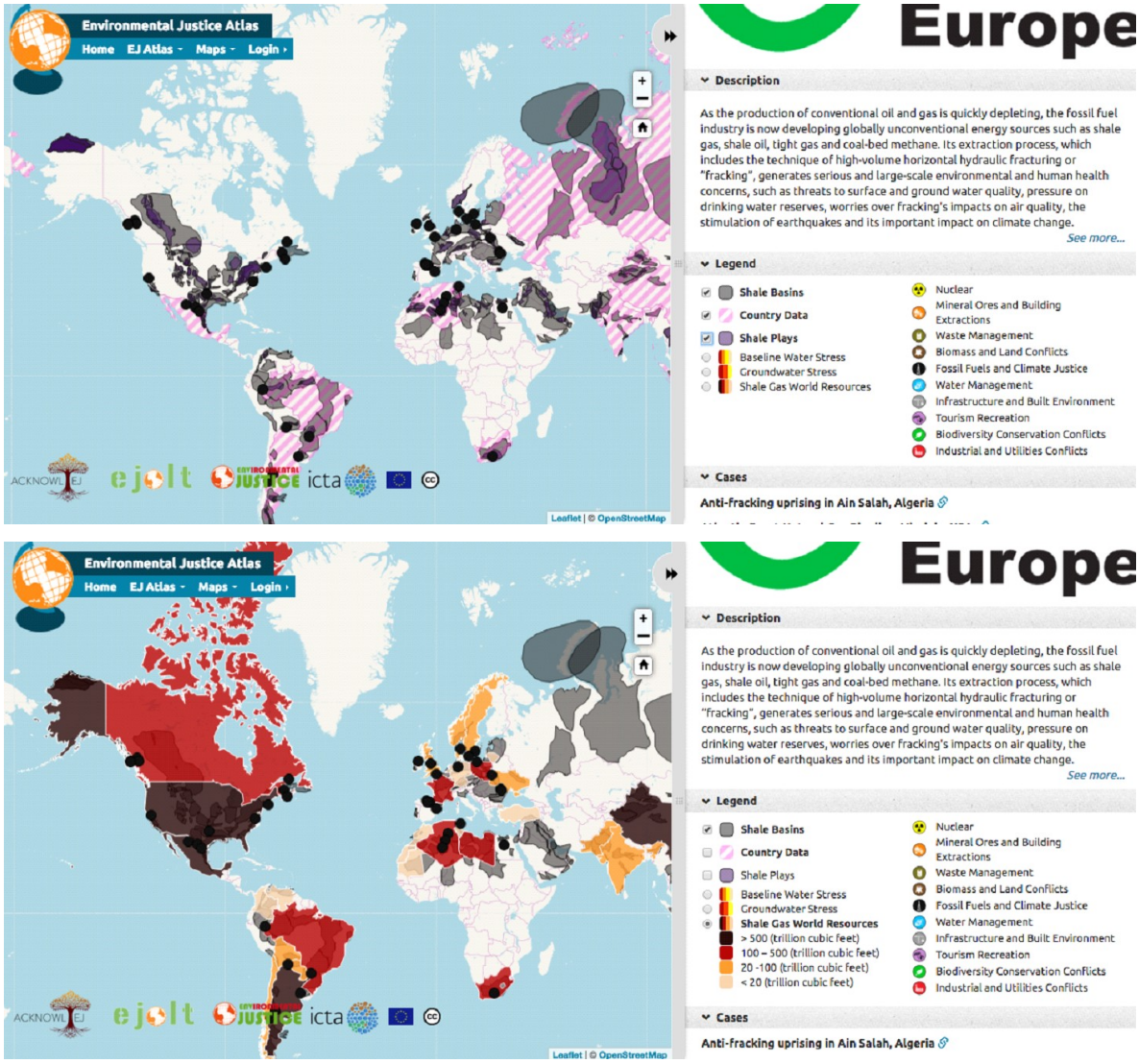


Figure 15: Fracking Frenzy featured map on EJAtlas with different vector layers turned on and off via the legend.

To contribute to the Atlas, visitors must create a user account and log in. Once logged in, they can generate a new conflict form to fill out. Once filled out, contributors submit the case for moderation. A member of the moderating team reviews the case and depending on the content either approves it and publishes it on the platform or writes to the contributor with suggestions for edits. The moderating team ensures that each case generally fits EJAtlas' main criteria, namely that it centers on an economic activity or legislation with negative impacts on environment and society (actual or potential), that environmental justice

organization(s) and/or local individuals claim that this harm has taken place or will likely take place and, therefore, the need to mobilize and that the conflict is documented in one or more media stories (Temper et al. 2015).

Beyond mere documentation, the Atlas aims to facilitate transformative knowledge production, advocacy and activism while simultaneously contributing to ongoing theorizing and networking around environmental justice issues. By making rural environmental conflicts visible, for example, it expands on the historical understanding of environmental justice struggles as primarily urban (Temper et al. 2015). Indeed, contributors to the Atlas have brought attention to more than 1,800 rural and semi-urban environmental conflicts, accounting for eighty-four per cent of all cases in the Atlas. Thus, the Atlas broadens the umbrella of environmental justice by demonstrating that issues of ecological distribution—often highlighted historically by environmental justice movements in urban United States, involving toxins and environmental racism (Pulido et al. 1996; Pulido 2000; Sicotte 2016)—are relevant in a wide diversity of socio-environmental struggles where communities claim for access to resources, health rights, land rights and more. At the same time, it addresses critiques of the overly rural and localized focus of political ecology by including hundreds of urban and semi-urban cases and globalizing our understanding of environmental conflicts.

Moreover, while some goals of the Atlas are more explicitly political and others more clearly academic, there is quite a bit of overlap (Temper et al. 2015). More political goals include use of the Atlas to aid in denouncing environmental injustices, exchange of action strategies and strengthening international articulation between place-based movements, provision of reports on concrete cases and legal disputes to be used as a resource and to pressure policy-makers and politicians to support policies that are environmental justice friendly. More academic-oriented goals include theorisation, 'a statistical understanding of environmental justice struggles', and to aid 'new processes of knowledge creation' from an environmental justice perspective. Blurring the line further between the political

and academic, the Atlas aims to facilitate productive lesson-learning via analyzing case data, including patterns of mobilization, success rates of resistance movements in stopping extraction projects, the impact of regulations and more (ibid.).

Finally, by mapping cases of environmental conflict on a global digital platform, EJAtlas aims to go beyond national or regional mapping, providing a tool for analyzing multi-scale interactions inherent in global commodity chains, investing trends of transnational corporations, similarities across regions by type of conflicts, or groups mobilizing, forms of protest and more (Del Bene et al. 2018; Avila 2018). Through this act of documentation and visualization, EJAtlas aims to support the transformative work of environmental justice activists and academics alike.

For this chapter, we zoom in on two key issues, as each provides important insight into the academic and political challenges and opportunities faced by such a large-scale collaborative environmental justice mapping project. These are: (a) How the Atlas is being used and contributed to, by whom, and for what? and (b) Accessibility and the politics of representation surrounding the map's writing and visuals.

To understand these issues, we primarily draw from an analysis of the EJAtlas user survey and Google Analytics, as well as direct feedback from users and contributors.

3.2.3 Methodology: Analyzing the EJAtlas User Survey and Google Analytics

Visitors to the EJAtlas website can fill out a survey about their user profile and Atlas usage. The survey was designed to understand who is using the Atlas, for what purposes and how the tool can be improved to meet users' needs. It includes questions about the user's background, where their work is based, how they rank the Atlas on a variety of factors including accessibility and recommendations for

improvement, what they primarily use the Atlas for, how they define the term ‘environmental justice’, what elements make up a successful ‘environmental justice struggle’ and more. Responses from the survey were sorted in Excel sheets into multiple categories, some overlapping. Once cleaned, the full data set included 429 responses, which were sorted into six categories based on how each respondent had identified themselves, eliminating duplicate, blank and insincere responses. These six categories are Academy, Private Sector, Student, Member of Impacted Community, Government/Public Sector and Civil Society/Environmental Justice Organizations.

3.2.4 Findings from the Atlas

Diverse users, diverse uses: the who, what and how of EJAtlas visitors

Beyond providing an understanding of those who use the Atlas to highlight cases, survey data reveals trends about how the Atlas is used for both—and sometimes overlapping—political (professional or otherwise) and academic (teaching and learning) goals.

Google Analytics and the EJAtlas survey reveal that the Atlas attracts users primarily from India, the United States, and Colombia, in that order. This echoes the level of coverage in these countries as well as the languages the data is available in. Meanwhile, survey respondents report their work as primarily based in the United States and Colombia, followed by India and then Spain. Regionally, most respondents work in Latin America, followed by Europe, with lower representation from Africa, Canada, the United States, Asia and the Middle East.

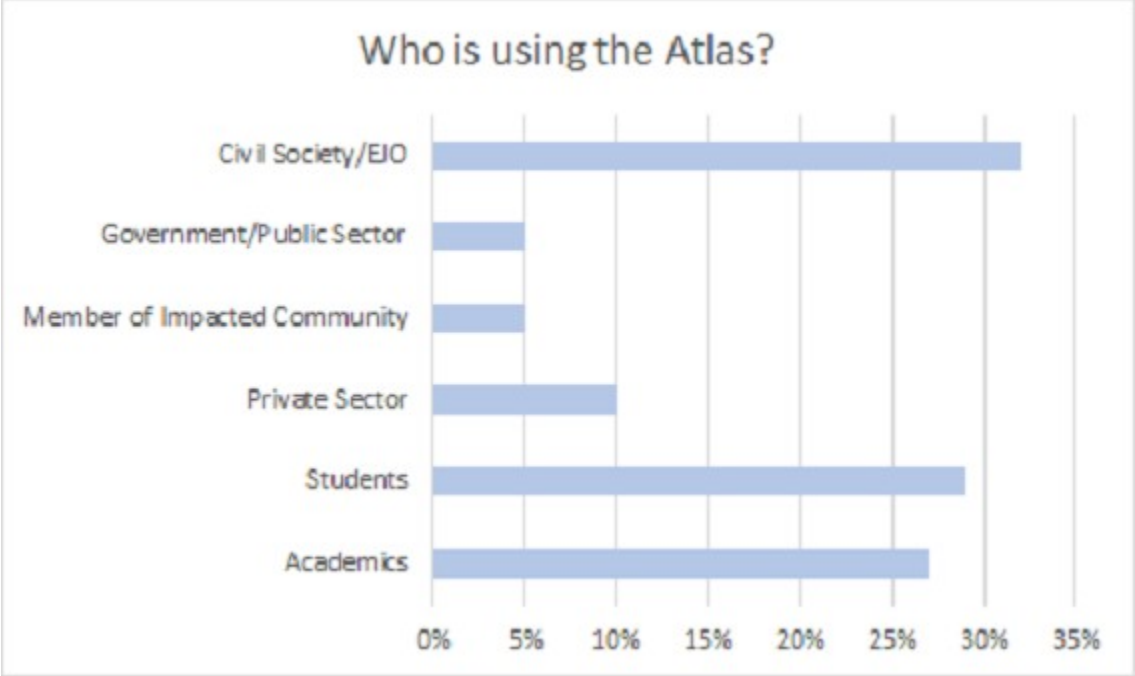


Figure 16: Graph showing who uses EJAtlas.

About one-third of the respondents identified themselves as coming from civil society and/or EJOs, making individuals from this group the most frequent users of the Atlas. Students are the second most active users, followed by academics. The Atlas is used less by individuals from the government and the public sector, and communities impacted by environmental injustices, with a bit more participation from the private sector. The relatively high representation from civil society/EJOs and low participation from members of impacted communities suggest that users of the Atlas work in an alliance, or in solidarity with affected communities, but often do not see themselves as from those communities. Though community members and civil society/EJO representatives rate the Atlas about equally regarding accessibility (in fact, community members rate it a little bit higher on average—4.1 out of 5, with 5 being the best—whereas civil society/EJO members rate it 3.9 on average), there are too few responses to conclude why so few survey respondents identify themselves as from impacted communities, if this is representative of all users and if so, why. This warrants attention and future research as the presence and participation of those directly affected by environmental injustice should be a central concern of any environmental justice project.

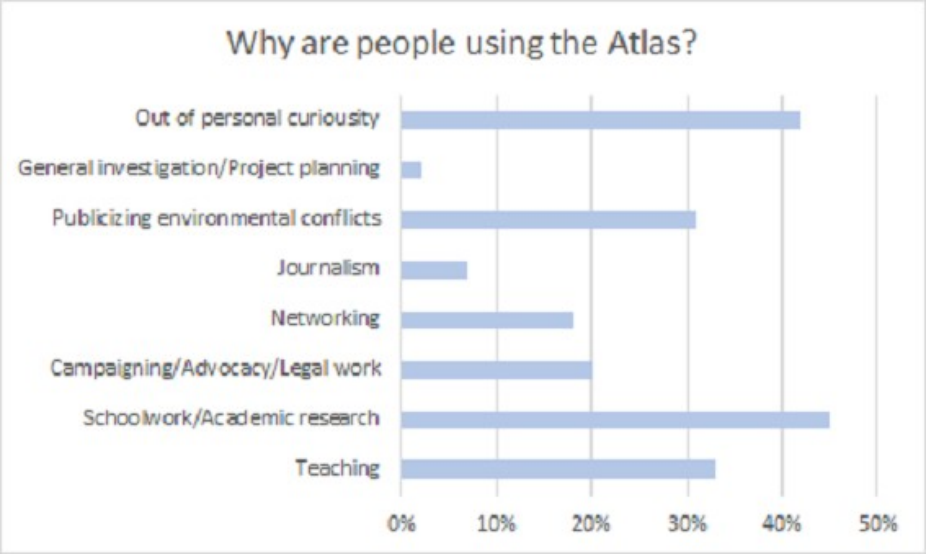


Figure 17: Graph showing why people use EJAtlas.

Moving on to *why* people use EJAtlas, according to survey data the Atlas' most frequent use is for schoolwork and academic research. A closer look at the responses reveal that students from primary school through doctoral programs use the Atlas for homework, school essays and dissertations; while academics frequently report using the Atlas for their research. One respondent, who is both a student and part of the private sector (working for a large international beer company), reported interest in mining and water governance and said they use the Atlas regularly for academic and personal research. A sixth-grade student from South Africa reported 'acing' her school project thanks to the Atlas information on her country, and said the Atlas is 'better than Google'.

Another frequent use of the Atlas is for teaching and presenting, in both institutional and popular settings. University professors from countries like Colombia, Puerto Rico and Canada use the Atlas in their classrooms as an educational tool. In South Africa and Australia, activists use the Atlas as a tool for documentation and advocacy. For example, a recent project aims to use the Atlas as a means to counteract activist burn-out and trauma. As we hear of more instances of the Atlas being used in these spaces we have focused more closely on

its pedagogical potential—documenting existing uses and also actively collaborating with educators and activists to further develop teaching materials in line with the platform, and also reflect on the difficulties they have encountered in terms of accessibility, language, moderation process and more (Walter et al. forthcoming).

While schoolwork, academic research and teaching are primary uses of the Atlas by students and academics alike, including popular educational approaches by civil society and EJOs, it is interesting to examine the political use of the Atlas by other actors, such as governments and those in the public sector. Diverse uses include relying on the Atlas as a reference for public policy and planning decisions by the National Planning Agency of a Latin American country's government. A government/public administration member from a European country's federal institute of natural resources, interested in mediating and mitigating mining conflicts via implementation of development projects, reports using EJAtlas regularly for planning technical cooperation projects and writing assessment reports for their government.

Impacted communities have used the Atlas to gather information both about companies (that are behind the investments they are resisting) and networking (with other movements). For example, a member of an Australian community resisting cyanide use in mining operations at the headwaters of a water catchment wrote that through EJAtlas the community learned that the CEO of the mining company had also been CEO of a company responsible for two cyanide spills in another country because that conflict was also documented in the Atlas. They planned to take this new information to the media with the hope that it would lead to the prosecution of the CEO for providing false and misleading information. Several months later local media reported that the mining company had dropped plans to use cyanide after extensive community resistance, and the chief executive of the company resigned, though there are no reports of prosecution.

In another case, the Unión de Afectados por Chevron-Texaco (UDAPT), primarily based in Ecuador, put together a small team of researchers between their office in Quito and at the EJAtlas moderation team to research other cases where the same oil company was involved. For at least three months in 2015, they reached out to communities and other EJOs involved in 30 cases, including in countries like Brazil, Australia and Kazakhstan. They published a featured map on the Atlas, which showed that the impacts from the activities and bad practices of the oil giant are not sporadic, but rather systematic. The map was presented at the 2015 shareholders' assembly of Chevron in California by one of the UDAPT lawyers. At least some of the smaller investors were responsive and showed some concern. The map also had wide dissemination in national and international media and supported UDAPT's campaigning initiatives.

At the same time, we are also aware that the EJAtlas data can also be leveraged by other unscrupulous actors whose prime concern is not the pursuit of environmental justice. For example, we have been contacted by insurance companies that aim to use the EJAtlas data to set premium rates for mining companies operating internationally. While increased premiums due to knowledge about human and environmental abuses can be tentatively welcomed as a further deterrent to investment, there is concern about the potential for the data to be leveraged by international financial institutions and multinational corporations or others involved in human rights abuses. We are attentive to such concerns about misuse of the Atlas data in a way that is harmful or antithetical to the goals of environmental justice activists, as well as the risk of academic analysis that misconstrues or misunderstands the data present. In response to these concerns, we have developed mechanisms to protect contributors' privacy and offer accessibility based on shared values.

Visual representation and accessibility

This section highlights two key concerns that emerged over the first years of the

Atlas: accessibility and the politics of representation. The Atlas aims to be as accessible as possible, but it is also data-heavy. When one opens the webpage they are offered an immediate snapshot of the 2,500 geolocated cases featured around the planet, a presentation that aims to be visually accessible but leads to potential trade-offs between visual representation and other forms of accessibility. Atlas users with less reliable or slower internet connections report glitches and failure to load, particularly on mobile devices. These same restrictions apply when inputting new cases, also due to slower internet connections in certain areas. For this reason, one potential solution currently under discussion is to develop downloadable print layouts of the maps. Another option often raised by users of the Atlas, including professors using the Atlas in their classes, has been to make the platform more mobile- and tablet-friendly. While this could increase accessibility, it remains to be seen how feasible this would be due to costs and tech support needed.

Another key issue surrounding accessibility is that English is by far the dominant language on the platform, and the case entry form is monolingual. However, there are separate language- and region-specific EJAtlas platforms for Italy and Turkey, and plans to launch an Arab regional platform entirely in Arabic soon.

Political implications of visual representation in EJAtlas

Beyond accessibility, there are other political implications of the visual aspects of the Atlas. A prime one concerns the use of a North-up Mercator projection for the map, both formats that have long been critiqued by critical cartographers and others for spatially privileging a Euro- and North America-centric view of the globe, exaggerating the physical space occupied by these regions and dramatically understating the relative size of other regions like Africa and South America. While EJAtlas is a critical mapping project and the logo itself is a South-up map, technical limitations due to the base layers available and questions of legibility mean scaffolding the data on a South-up map is not feasible.

Further, the available layers that include a topo map (the default), a world imagery map (satellite) and a landscape map present their thorny political questions regarding borders and place names included in each. Below, the images show the same region of the Atlas with different layers.

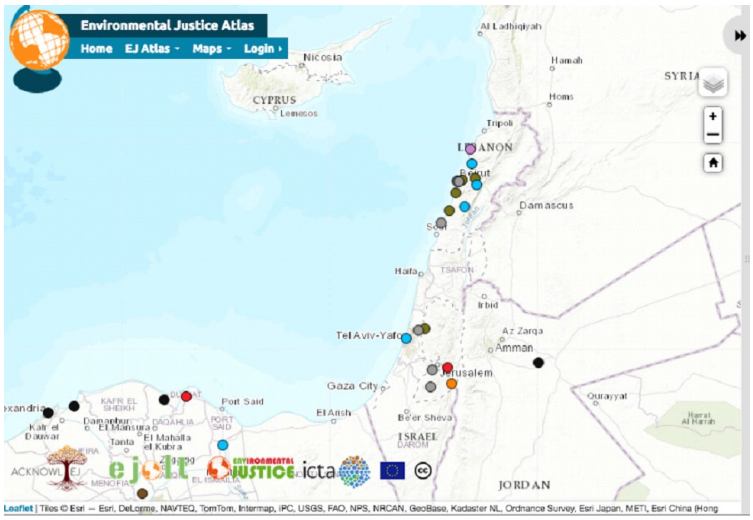


Figure 18: EJAtlas World Topo layer.

Figure 19: EJAtlas World Imagery layer.

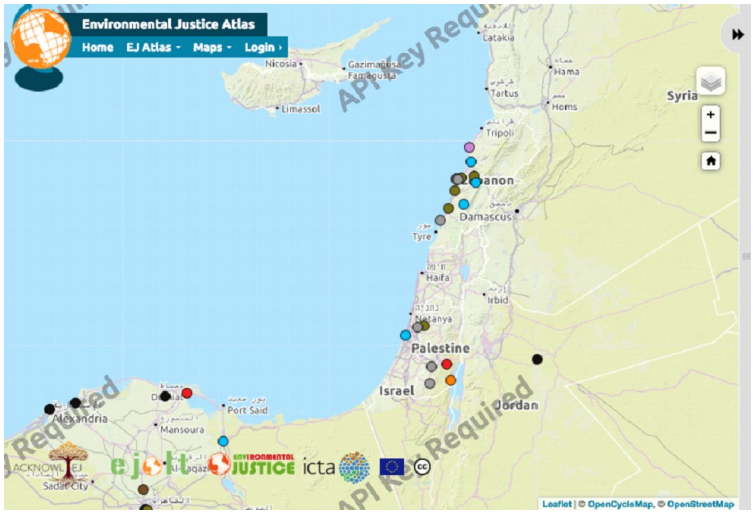


Figure 20: EJAtlas World Landscape layer.

As one can see, there are important differences, with political implications, between the topo and landscape layers regarding place names and borders in this region. For a project aiming to incorporate principles of sovereignty and justice, it can be contradictory to use GIS layers that divide territories, rely on colonial understandings of space and use corporate data from companies like Google.

Along these lines, the EJAtlas coordinators have been contacted by members of rights groups with concerns about colonial and corporate borders, and accompanying issues of erasure, highlighting how important and politicized representation on a digital map can be.

In reference to the depiction of Palestine on our default base map layer (the topo option), an individual wrote to the EJAtlas moderators drawing attention to issues of representation of space on one of the EJAtlas layers. They questioned the source of the original data set, saying it acted to disappear a people, its cities and its rights; and reflected an expansionist Israeli vision. In particular, they noted the lack of Arabic writing, Hebrew place names in the West Bank and East Jerusalem and incorrect lines drawn.

While this individual highlighted the political issues surrounding the depiction of

borders and place names in line with global foreign power interests, another user from a Western Sahara advocacy group drew attention to the political implications of privileging a more 'local' (in this case, regional/state) power interest over global and colonial-imposed borders. They argued that the missing border demarcating Western Sahara gave the impression that the territory falls under the control of the Kingdom of Morocco, attributing this to the state of Morocco's 'powerful lobby' on the issue. They went on to provide a legal argument for why the border should be depicted— citing the history of the region, the implementation of colonial borders and international law—arguing that the border of Western Sahara implemented during colonial times is still the correct border and should appear on the Atlas.

These requests illustrate the challenges of doing an emancipatory mapping project while relying on tools such as Google Maps and ArcGIS. As a response to these comments we sought alternative base maps, but there were none available that fit our needs. If resources permit, we hope to create a topographical layer that does so in future.

3.2.5 Discussion and Conclusion

In this chapter, we briefly explored some political and academic dimensions of the Environmental Justice Atlas (EJAtlas). Several years' worth of survey data from the Atlas users along with direct feedback and Google Analytics provides insight into (a) how the Atlas is being used and contributed to, by whom and for what and (b) accessibility and the politics of representation surrounding the map's writing and visuals, helping guide the project forward in order to meet its transformative goals.

This type of collaborative activist–academic projects can be considered 'co-production of knowledge', as a way to recognise that the knowledge produced and/or made visible through them comes as a result of engaged interactions not

isolated to either just the university or just a social movement or organization. Survey data from EJAtlas supports an understanding of the Atlas data as 'co-produced', due to the diversity of the individuals contributing and analyzing cases, and also highlights how different actors involved in such a collaborative process may be approaching it with very different motivations, needs and perspectives.

In co-production processes, one might expect that this would happen; that each actor would approach the project with their own understandings and conceptualisations. However, often, co-production processes take place on a smaller scale between groups that share contexts and perhaps more common goals. EJAtlas provides an interesting case to examine what happens in co-production processes that transcend the local, with co-producers situated in very distinct and diverse contexts around the world. Future work will delve deeper into this aspect of the Atlas, including an analysis of the hundreds of survey responses defining 'environmental justice' and 'environmental justice success'.

Arizona-based political ecologist Tracey Osborne (2017) calls EJAtlas an example of public political ecology (PPE), which she offers as a form of engaged scholarship in the context of an ecological crisis that incorporates political, ethical and educational aspects. Drawing on Antonio Gramsci's idea of the philosophy of praxis, PPE sees ideas as a material with revolutionary transformative potential, and mapping as one important methodological approach for political ecologists to engage with the broader public in a potentially emancipatory way.

Indeed, survey results support her analysis, at least of the incorporation of the political, ethical and educational aspects, and the transformative potential of the co-produced knowledge present in the Atlas, with a possible concrete example found in the resignation of a CEO and moratorium on arsenic use in a mining case. However, the results also highlight the complications and opportunities of a 'public political ecology' project that engages with and is shaped by such a large and diverse 'public'.

In particular, this project highlights the frequent trade-offs one must often make between different priorities and aspects of work that are both academic and politicized. One clear example of this emerges around the issue explored—of accessibility and 'just' representation, which may change depending on the context of each user and what may be most 'politically correct' from their perspective (which may or may not collide with other users' perspectives). Efforts to alter the visuals of the map to more justly represent various spaces would likely impact the accessibility of the map, perhaps in both positive and negative ways, and vice versa.

Further ethical questions of a political nature emerge around the potential use of the Atlas data by the private sector and governments in a repressive way, and concerns about how corporations, insurance companies and others might use the data for exploitative or for-profit activities. We must be acutely aware of the possible issues of accessibility and lack of engagement of those on the frontlines of environmental injustices, and how to incorporate feedback regarding design and visual representation when considering issues of justice—balancing, for example, the already mentioned issue surrounding ease of diffusion and widespread accessibility (including the need to not overload the server with too complex of a database) with multiple language needs and diverse political understandings of borders and place names.

Challenges of an academic nature are also found in this type of project, though many have a political trade-off. For example, there are complications for analysis of data collected via different methodological approaches depending on the region, yet this arguably makes the project more attentive to the heterogeneity of regional needs and design priorities (for example, the development of regional platforms managed and designed by activists and academics from those same regions). On the other hand, many academics request access to the full data set in excel format, which would aid them in their processes of academic analysis. Yet, thus far we

have denied this access to the vast majority due to the lack of a data use guideline policy, and concerns about the misuse and misinterpretation of the data, along with some security concerns, all of which could endanger the transformative political work of the Atlas contributors. The current framework for allowing access to the full data set also privileges early-career environmental justice scholar–activists with job precarity closest to the project and contributing the most to the data set, over less involved, later-career researchers, thereby, at least partially, attempting to dissuade cases of academic extractivism.

Identifying key values

Based on this analysis, I would like to draw attention to some key values that appear to be emerging within the EJAtlas project. These are:

- ***Accessibility*** *(Accessibility regarding the map is being prioritized by the coordinating team, despite the data-heavy nature of the platform. This is demonstrated by efforts to prioritize access across languages, for example).*
- ***Transformativity*** *(The Atlas strives to contribute to transformations of environmental justice conflicts around the world and underlying structures of injustice)*
- ***Reciprocity*** *(Collectively-produced knowledge is used by diverse actors engaging with the map. Priority for engagement with in-depth data beyond what is available via the outward face of the platform is granted to those who are taking the time to significantly contribute to the mapping efforts)*
- ***Stewardship of Knowledge*** *(Efforts are taken to protect the knowledge from attempts to mis-use it. While accessibility is important, so is stewardship. This includes efforts to resist and prevent academic extractivism)*
- ***Just Representation*** *(Efforts are taken to ensure that the way knowledge is represented is just).*
- ***Valuing Movement-Informed Education*** *(The Atlas is widely used by students and teachers for learning purposes. This is its most common use.*

This shows a key value of contributors and users being movement-informed education.)

EJAtlas has a long future ahead, and we are excited to continue to explore its potential, tackling complex political and academic challenges as they arise. While mapping these conflicts in a just way presents difficulties, feedback and engagement from the ever-growing group of users and contributors from around the world help us hone the Atlas to act not just as a documentation platform, but as a tool that can work to *transform* the very conflicts and patterns it depicts.

3.3 CHAPTER THREE

Research Worthy of our Longing: Insights for Relationship-Centered Transformations Research[9]

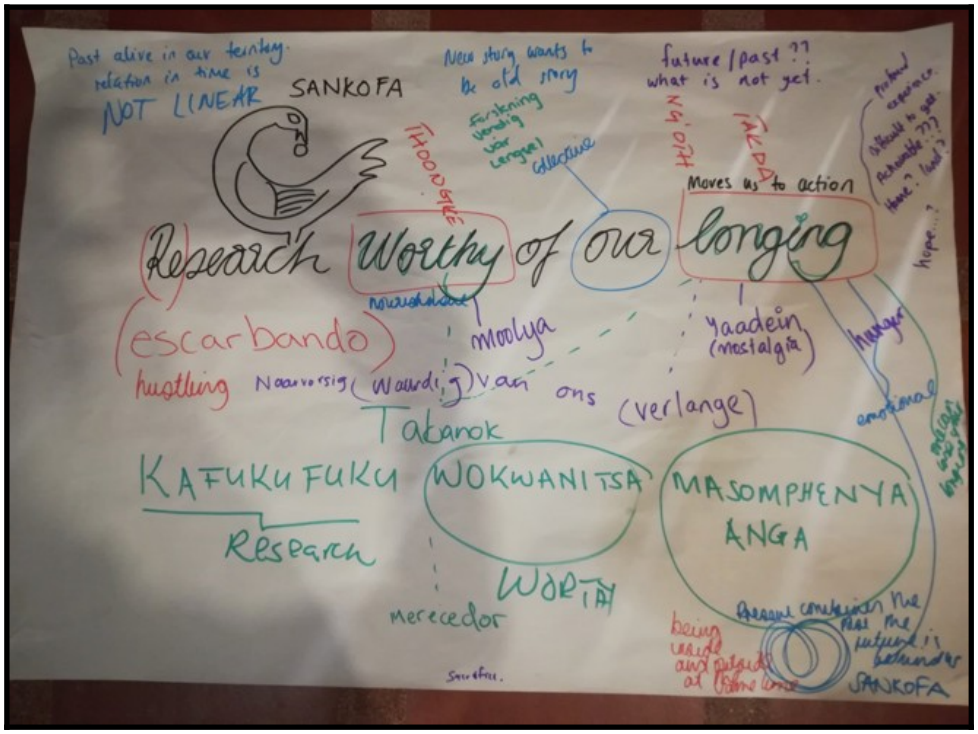


Figure 21: Research Worthy of our Longing activity

9 The following chapter emerges from a collective writing activity that I designed and co-facilitated as part of the Living Aulas Alternative Research School. All Living Aulas participants are considered co-authors due to the diverse, essential roles each person played in surfacing the reflections included here, including co-writing.

Co-authors: Lena Weber (Autonomous University of Barcelona, Spain), Anna James (Rhodes University, South Africa), Injairu Kulundu-Bolus (Rhodes University, South Africa) , Dylan McGarry (Rhodes University, South Africa) , Kuany Kiir Kuany, (UNESCO), Shruti Ajit (Kalpavriksh Environment Action Group, India),Rebecca Shelton (Arizona State University, USA) , Gibson Mphepo (Leadership for Environment and Development (LEAD), Malawi) ,Almendra Cremaschi, (Centro de Investigaciones para la Transformación CENIT, Argentina) , Leah Temper (Universitat Autònoma de Barcelona, Spain/McGill University, Canada), Tania Villarreal (Corporación Nuh Jay, Colombia), David Coral (Corporación Nuh Jay, Colombia) , Tatiana Monroy (Ecovillage Aldeafeliz, Colombia), Margarita Zethelius (Alianzas para la Abundancia, Colombia), Martha Chaves (Fundación Mentes en Transición, Colombia) , Thomas Macintyre (Fundación Mentes en Transición, Colombia)

3.3.1 Introduction

"Research Worthy of Our Longing". With this phrase scrawled across a paper in our outdoor meeting space, Injairu Kulundu and Anna James led the group through an interactive process of sharing perceptions across languages and cultures. We had come to Colombia from around the world as 'early-career researchers' from three International Social Science Council (now International Science Council) Transformative Knowledge Networks (TKNs)—Pathways, T-Learning, and ACKnowl-EJ[10]—to discuss unique challenges and opportunities we face in our work for transformations to sustainability. While some of us are firmly rooted in universities, others in NGOs, social movements or community groups, we all (re)search: for information, truths, different ways of existing, alternatives to hegemonic development, and strategies for addressing socio-ecological ills. And now we discussed: How would one translate longing? How does 'worthy' best translate into Spanish, as 'a la altura de', 'merecedor', or something else? What does it say about how we understand value and express values? What about into Swahili, or Afrikaans?

The concept of research 'worthy of longing' was introduced by Injairu, inspired by her reading of Salman Rushdie's *The Ground Beneath Her Feet.* Since then it has percolated throughout the three TKNs, and resonated deeply with our Living Aulas (Living Classroom) cohort, as we seek to understand our role in the world and the type of work we dream of doing, and how best to contribute to building worlds worthy of our longing, or yearning.

"Song shows us a world that is worthy of our yearning, it shows us ourselves as they might be, if we were worthy of the world." (Rushdie, 1997)

These reflections are inspired by movements around the world aiming to foster different academias and research cultures — sometimes denominated alternative, de- or anticolonial, activist, militant, or critical scholarship (eg. Hale 2006, Borras

10 Pathways to Sustainability project; Transformative, Transgressive Learning in Times of Climate Change project; and the Activist-Academic Co-Production of Knowledge for Environmental Justice project

2016, Mignolo & Escobar 2010, Suoranta 2022, Watts & Hodgson 2019). A common thread of these approaches is that they all aim to transgress the limitations and transform the toxicity of dominant forms of academia and knowledge production steeped in eurocentric, elitist, colonial and imperial values. Such activist forms of scholarship critique extractivist forms of knowledge production often conducted at the service of states, corporations, and militaries (Peake and Kobayashi 2002, Strega and Brown 2005), and argue that they are unable to adequately address the socio-ecological crisis we currently face (Carpenter and Mojab, 2017).

Meanwhile this body of work calls for new transformative knowledge paradigms more capable of addressing today's wicked problems (Lotz-Sisikta et al. 2016, Temper et al. 2019) and argue that deeper connections to social justice and environmental movements are needed (Harvey 1996, Bonta 2008, Plumwood 2012). Haider et al. (2017), another group of early career sustainability researchers, have described challenges in sustainability research today, in which there is pressure to both be specialized in one discipline while also being able to communicate between epistemologies, which they argue can be approached by practicing epistemological agility and methodological groundedness[11].

This paper expands upon Haider et al.´s (2017) approach to argue that 'research worthy of our longing' could, in part, stem from what we call situational groundedness: research practice that centers around relationships often invisible or unacknowledged in mainstream academic research, echoing Bhaskar's (2020) four-planar social being. These are our relationships with the self, others, knowledge, and the Earth. Like Haider et al., we see 'research worthy of our longing' as a journey; one which could better work for socio-ecological change and for us and for those we care for as living, breathing, complex humans.

11 Haider et al. (2017) define methodological groundedness as the ability to understand and handle at least one methodology relevant to sustainability science but ideally more broadly applicable. Epistemological agility is a cross-disciplinary understanding of diverse epistemological and ontological perspectives, and the ability to collaborate and work within and among these perspectives.

We see the specific contribution of this paper as an exploration of transgressive research for sustainability from a relational perspective, critically analyzing specific methodologies used to probe such relations. Transgressive, relational research praxis, with an understanding of researcher-as-learner, can help us overcome alienation and remoteness in order to foster more transformative knowledge production processes. We need new research paradigms to help us move towards socio-ecological transformation, and so this paper provides insight into what this paradigm can look like in action for up-and-coming transformations researchers, by building off of the work of other, critical early career sustainability researchers (eg. Haider et al. 2017). We introduce and describe 4 methodologies we created and practiced for researcher-learning which center epistemic agility, methodological and situational groundedness, challenging our research to become accountable to its practice in the world.

We begin by briefly introducing what we mean by 'transformation' and present the Living Aulas program as a methodology for researcher reflexivity that surfaced these reflections. Next, for each relational plane, we include an example of a relevant activity we engaged with in Living Aulas that allowed us to explore this relation. Each activity is followed by a pearl of wisdom (guidance) and a thorny question (problematization). We then discuss how these insights contribute to our understanding of a transgressive, relationship-centered transformative knowledge paradigm, and we wrap up with a short discussion, dreaming of how institutions could better accommodate this type of research, concluding with a call for continued deep reflexivity and exchange with more voices regarding research for socio-ecological transformations.

3.3.2 Research for Socio-Ecological Transformations

The concept of 'transformation' is gaining popularity as a way to build radically different futures in the context of immense social and ecological challenges including climate change, rapid environmental degradation, and widespread social inequity (Future Earth 2014). Indeed, shifts in funding structures and discourses at

the highest levels show how transformation thinking is becoming mainstream. For example, the United Nations has stated the need for 'bold and transformative steps' to reach sustainability goals, while the Intergovernmental Panel on Climate Change has called for large-scale transformations to stabilize greenhouse gas emissions. (Blythe et al. 2018).

Two broad strains of thinking shape our Living Aulas cohort understanding of the term 'transformation/s'; The first is a perspective more common in Sustainability Science concerned with adaptation and normative thinking on a systems level. The other, more radical approach is more rooted in critical education traditions (Carpenter and Mojab 2017), embodied phenomenology (Kupers 2016) and anti-oppression scholarship that departs from an explicit anti-capitalist analysis including Lotz-sisitka et al.´s (2015) mapping of transformative and transgressive learning for higher education sustainability training. Considering both of these perspectives helps us think rigorously about transformation and reminds us to avoid advocating change for the sake of change, rather than change for the sake of transforming the socio-ecological catastrophe we are currently in. It also aids us in understanding how we can more effectively conduct Transformations research that aims to be *transformative* in and of itself.

From a Sustainability Science perspective, Smith et al. (2011) describe adaptation as a process of behavioral adjustments that maintain the status quo of a system, whereas transformation is a greater change in the system. This can occur because a system threshold is reached, which requires the formation of new objectives. However, in some cases, incremental (often hard to observe) adaptation adjustments and their associated system feedbacks lead the system into transformation (Béné et al. 2014; Nelson et al. 2007; Park et al. 2012; Pelling and O'Brien 2015). Transformation has occurred throughout history, but now, with Futures thinking, we have begun to deliberately plan and steer systems towards desired states (Smith et al. 2011).

A more critical approach to transformations reminds us that the field of Sustainability Studies has tended to be dominated by the natural sciences and

knowledge production paradigms built upon claims of objectivity, neutrality, and uncritical positivism (Temper et al. 2019), and that it has failed to provide adequate solutions to the devastating problems we currently face (Peake & Kobayashi 2002, Kobayashi 1994, Farahani 2011, Potts & Brown 2005, Mahtani 2006). Val Plumwood (2002) argues that the roots of these crises are relational, pointing to a "rigid barrier between subject and object which excludes relationships of care, sympathy and engagement with the fate of what is known" (Plumwood 2002 quoted in Stephens 2009, 58). This barrier acts as "a repudiation of direct emotional relationship in the knowledge relationship" leading to emotional, epistemic and moral distancing, or "remoteness", which allows ecological destruction to be ignored, misunderstood, or displaced (Plumwood 2002, Stephens 2009).

In an effort to overcome remoteness and distancing we propose centering relationships at the core of Transformation Studies and research methodologies, avoiding approaches that could (re)produce remoteness and reinforce harmful relationships both within and outside of institutional walls (Peake & Kobayashi 2002, Kobayashi 1994, Farahani 2011, Potts & Brown 2005, Mahtani 2006). As early career transformations researchers, we aim to experiment with approaching knowledge production processes differently in order to increase our transformative potential.

To date, alternative paths forward are not so clear. Despite Transformation Studies' growth as a field, it still lacks coherent framing, with tension between theory and practice (Blythe et al. 2018). This group of co-authors has explored transgressive methodological approaches to research in other works, informed by critical theory including feminist scholarship and ethics of care, environmental education, embodied phenomenology, indigenous scholarship and anti-oppressive research. These social science bodies of theory, largely absent in sustainability transformations research to date, emphasize the relational aspects of research and can help inform the challenges we face as researchers in a post-normal world

(Sardar et al. 2010) full of chaos, contradictions, and complexities (Temper et al. 2019).

Our understanding of transformation considers that the external state of the system is driven by worldviews, values, and power structures. This suggests that transformative changes required to change the external state of the world, might begin from places of internal change. As researchers, we therefore hold that indicators for transformative work take into account not only external tangible, visible changes, but also internal and relational changes among actors in a system. We refer to this as a relational approach to understanding transformation in our research practice. We argue that such a sustainability-oriented transformative knowledge framework that counters remoteness through situational groundedness that centers relationships- with others, ourselves, knowledge and the Earth- could help better guide us through the sticky mess of research design, process and outcomes.

3.3.3 Methodology - Growing Transformative Research Cultures

Living Aulas (Living Classrooms) initially grew from in-person encounters within and between the three TKNs, through which a need was identified to better understand how to conduct collaborative research for socio-ecological transformations by combining existing theory and emergent praxis, incorporating diverse ways of knowing, and challenging hegemonic norms of dominant forms of knowledge production. A small group of academic and non-academic early career researchers from the three TKNs began to meet weekly via zoom, a practice that over the course of many months led to the collective designing of the Living Aulas program as an alternative research school for scholars, practitioners, and change-makers addressing pressing socio-ecological challenges in diverse contexts. A key moment in the planning was a 'dragon dreaming'[12] session in which Martha Chavez, despite our virtual meeting space spanning five different time zones,

12The Dragon Dreaming Methodology is a process in which individuals 'dream' and then form a collective vision, followed by an action plan to reach this dream. More can be read at http://www.dragondreaming.org/wp-content/uploads/Fact-Sheet-Number-10-Dreaming-Circle.pdf

guided us through a profoundly grounded scenario-building methodology for more clearly identifying our needs, desires, and objectives for Living Aulas.

The objectives included a desire to generate a transformative, replicable space to reflect on research, ethics, activism, and praxis; to create an environment that pushed us out of our comfort zones while still making us feel safe, with deep listening, balanced voices and narratives, and a focus on meaning in our work; and to have the space be creative, experimental (with the concept of transformation and pedagogical activities), and allow for active reflection on the personal, local and global environmental justice impact of our research while connecting with our immediate context.

The school, funded by the International Science Council, took place from June 5-9th, 2018, in the coffee-growing region of Colombia. A central aim was exploring rigorous processes of sustainability research and building a research culture equipped for uncertainty, change, and our own positionalities. Each day, we engaged in a series of activities[13] to reflect upon, share, and deepen our understanding of the realities, obstacles and opportunities present in research for transformations. These activities/methodologies were designed by and for the participants and included creatively grappling, crafting and sculpting different frameworks and theories of change, delving into challenging questions like the one posed by Injairu and Anna on 'research worthy of our longing', speaking about which boundaries need to be broken within our research processes, exploring the elemental aspects of our work, and more, all of which served as a foundation for a session on collaborative paper writing, out of which this article was born.

One particular aspect of collaborative writing we explore here is an attempt to avoid homogenizing all of our perspectives and writing styles, and instead leaving certain sections as the original text of contributing authors. This style is similar to an experimental dialogical style present in previous articles written by members of

13We hope to someday publish an activity booklet of these!.

the T-Learning project, which we believe better incorporates a multiplicity of voices than typical academic writing (see, for example, Kulundu et al. 2017 and McGarry et al. 2021).

3.3.4 Results: Pearls of Wisdom and Thorny Questions in Relational Research

In the following section we examine each of the four relational aspects of research we wish to highlight: our relationships with ourselves, with others, with knowledge, and with the Earth. We describe the activity/methodology we used during the Living Aulas school to explore these relations and then share reflections which emerged. These insights are not necessarily novel, and certainly not comprehensive. However, they are the central points that emerged and so we choose to highlight them as generative starting points for us as early career Transformations researchers. We also hope this format provides a foundation for future work thinking through a relational transformative knowledge paradigm: inclusion of activities, pearls of wisdom and thorny questions allows us to consider how to *actively reflect* (praxis), what we *already know*, and what we *need to explore*.

1. Relationship to ourselves

Authenticity

Our relationships with ourselves as researchers can be considered from a variety of perspectives, including our values and ethics and how/if we are able to embody these in our work, our positionality, and self-care. The Hero's Journey activity is one example of how to actively engage in reflexivity on our personal journeys and contexts. The more we work through the murkiness to understand ourselves and our own positionality, the more we can express ourselves authentically and understand how this might shape the knowledge production process. By better knowing ourselves and grappling with our own ethics, we learn to apply these to

our work, reducing remoteness within ourselves and identifying more clearly what we aim to transform and how we can do so in a way true to ourselves.

Activity

The Hero's Journey: personal and relational reflexivity in becoming transgressive and
transformative researchers, facilitated by Dylan McGarry and Leah Temper.

Leah and Dylan facilitated the "Hero's journey" spaces to walk reflexively along the participants' individual and collective journeys. Participants familiarized themselves with a nuanced, multi-layered description of the Hero's journey (Campbell, 2003). Stage by stage we reflectively journaled together on key moments on our personal journeys as academics and transformative scholars. In the second session, participants shared parts of their stories along key moments of the journey. This process helped us in identifying our own processes of transformation in ways that may not have been as evident before, including transformative moments, mentors along the way, the darkest moments, and the elixirs that restored to us a new form of immortality before we began the cycle once again. It also helped us understand the relationality between us (theories of unity) and also how different some of our journeys were (theories of separation). The value of this process was to develop immersive empathy (McGarry, 2014), reflexivity, and solidarity amongst the sharing of vulnerabilities as a research collective. It contributed to understanding the motivations, intentions and histories that sit behind each of us. It also revealed the importance of creating quiet, reflective, personal spaces for journaling and systematically observing ontological shifts within ourselves (how our way of being changes) – mostly it allowed for the identification of key moments and processes in our personal journeys within a broader narrative arc, which is useful for understanding our work, and the baggage, intentions and positionalities we bring to it. This method joins another reflexive

process designed by Leah, Lena and Dylan, on exploring our journey as researchers. (Temper et al, 2019).

The **Pearl of Wisdom** we would like to offer regarding relationships with ourselves comes from Rebecca, who reminds us to:

Be embodied. Be honest. Be conscious and transparent. What is motivating the research and the researcher? Don't be afraid to be your full self in spaces of division, silos, disciplines and cultures. This allows others to remember their full selves, as well. Accept your own positionality.

As Haider et al. (2016) clearly articulated, we benefit from acknowledging that we are 'undisciplinary' researchers being trained by faculty with disciplinary roots. However, perhaps even more challenging, is that we are researchers that long for practice-based work, activism, and, to the extent that we are able, to be co-conspirators in sustainability transformations. As we pursue this path, we often find that we must not only bridge disciplines, but also more intentionally link the values and motivations that brought us to this work and the work itself. We desire that the work itself is not only realized in publications and conferences, but in places and communities. Thus, as scholars of sustainability we must 1) critically examine how our own daily lives do or do not reflect the values that we profess, observe, and record and, 2) when conducting research, we must fully accept and share our own motivations, biases, and positionality.

First, in our own lives, we can ask ourselves, should we be spending time writing about the fact that we should support local food systems if we don't have the time to go to a farmer's market on a Saturday morning? Should we be writing about the need for community if we don't have time to build one in our own lives? What do we do when certain sustainability lifestyles become something that is only possible for the wealthy? We long to become sustainability experts through embodiment of values and living more sustainable lifestyles as observing, reading about, and

analyzing others that live them is only one facet of what can be known about it. Second, we argue that we must have a fuller acknowledgement of 'self' in a research process. Most social sciences research describes, in its methodology, how the process minimized the possibility of producing researcher bias. However, as Fazey et al. (2018) describe, all researchers are embedded in the systems that they observe and are, arguably, interveners. When we engage in research processes, rather than show up as our role as 'researcher,' we should show up as our full selves and persons. We must not be deceived into thinking that we have complete influencing power over a process or complete lack of influencing power, you, like every other person in the process, contribute to and learn from it.

Thorny Question: One thorny question we grapple with here is how to continue this work while often living a paradox (for example, writing about farmer's markets without time to go to one). It is impossible to always align our values with our daily lives--this does not necessarily imply that we are always 'falling short', but could rather be seen as an opportunity for humility and vulnerability, and transparent recognition of how individual actions are enabled or obstructed within a broader system. Identifying the paradoxes in our lives can help us recognize where remoteness festers, and begin to fight to reduce it. But, how can we understand the nuances of the balance between hypocrisy and allowing ourselves grace to be imperfect? How do we identify the line between human imperfection, 'necessary evils' and privileged laziness? We spoke at Living Aulas of the contradiction between the deep desire to be physically together, recognizing the resulting richness that simply cannot be re-created digitally, and the fact that almost all of us had to fly from very far away to do so, using huge amounts of harmful resources to move our bodies across land and water.

2. Relationship to others

Engaged Dialogue

> *"I engage in dialogue not necessarily because I like the other person. I engage in dialogue because I recognize the social and not merely the individualistic character of the process of knowing. In this sense, dialogue presents itself as an indispensable component of the process of both learning and knowing" (Freire 1970, p 17)*

The weaving and navigation of relationships with others forms a central part of research. Particularly for transformations research, as we often find ourselves (or place ourselves) in highly collaborative research processes. There are a number of interpersonal relationships in sustainability/climate change oriented research contexts including between members of the research team and with the communities involved. Within these, we center the need for dialogue, alliance-building, maneuvering conflict and polarities, and active engagement with voices different from those most commonly listened to. In order to be effective, Transformations research processes need to challenge and work to transform negative power relations, hierarchies, and forms of exclusion. It must counter relational and epistemic remoteness by fostering dialogical research communities with different ways of knowing, prioritizing knowledge from those closest to the issue at hand.

Bringing together people and languages from across the world, and working with that plurality, is vital to the transformational potential of planetary citizens in the struggle for deep and just sustainability. It is about having ways to explore the axes of difference arising in the presence of different languages and understanding the power relations that result from the hegemony of language. It is not only about translating some exact meaning but also understanding the multiple interpretations, knowledges, worlds and ways of being that are offered across different languages.

This is an important counter-hegemonic notion, given the fact that only a few languages dominate the ‘sustainability space’ in terms of decision-making, policy, research and communication about particular issues.

Activity

Unpacking language diversity and power, and "A future that is worthy of our longing”, facilitated by Anna James and Injairu Kulundu

Harnessing the wide range of languages present at Living Aulas Research School, we invited participants to divide into groups and to translate the phrase “research worthy of our longing” into different languages. It was useful and important to have a broader purpose within which to do this exercise; we could meet each other around the concept and purpose of research before we unpacked it further, to bring an awareness of the multiple languages amongst us, to interrogate, expand and problematise the different meanings of the concept "research worthy of our longing".

During the session we found that we had between us at least 12 languages (Dinka, English, Spanish, Chichewa, Swahili, Hindi, isiXhosa, isiZulu, Afrikaans, Norwegian, German, French). Sharing the different translations was very generative. For example, Spanish speakers decided they found the Spanish word ‘investigación’ to be too technical a word for how they understood their research. They decided the word ‘escarbando’ would be more appropriate and it translates as something similar to ‘digging’ in English. This would more appropriately describe the approach to active research that makes its way through complex relationships towards a result that is not defined a priori. The term "longing" brought up a conversation about the future and the past, as well as the question of arrival. Are we longing for something that was or for something that has not yet been realized? In addition, is longing ever achieved? Or are we working towards something that we will never reach? Perhaps it is the enactment of working towards longing rather

than the fact of reaching the desirable point: home, hope, land? Instead it is about a desirable mode in which to be, to research, to dig.

Our **Pearl of Wisdom** for this relationship comes from Anna and Almendra, who remind us to:

Build the emotional bridges and friendships necessary to nurture relationships for dialogue; manage ruptures, build alliances to visibilize and nourish research through significant exchanges.

When groups of people gather around a particular challenge like water scarcity in Cape Town or seed sovereignty in Argentina, their commonality lies in a concern for the problem but they come with different views, objectives and interests. Sensitive and meaningful dialogue founded on strong emotional connection could transform the gathering into a committed group and allow for the emergence of alliances, able to inspire deliberative and creative solutions and *concrete actions*.

Dialogue, understood with Freire, is a process of knowledge production and learning, in which we are seeking not just the sharing of monologues but rather a "creative exchange in which new understandings are generated' (Choudry 2015 pg 102). Such dialogue is needed for collaborative problem defining *and* solving, which is hugely challenging in a world structurally divided and disconnected. It is these alliances that are fundamental to active and engaged research.

Our work with the T-Learning and Pathways networks allows us to identify two purposes for collective dialogue between which we swing, constantly back and forth. The first is the work of re-framing through 'co-defining' the matters that concern the research context' (Lotz-sisitka 2016). This notion is an important push-back against traditions of extracting 'data' for predefined questions. This move is ideological and results in research findings that do not consider the historical material space and practices relevant to the context. As different stakeholders come

together, new insights are brought together and we create 'new understandings' about the problem' and we co-generate the research questions.

The second is developing strategies for reflexive action where we reflect on what we are learning while seeking answers to questions, and then are able to reframe our work based on this. The cycle repeats. Both of these impact upon each other because reframing continues as we keep learning about the problem through our actions; building theory of practice, in practice (Lotz-Sisitka, 2016).

One **Thorny Question** we tussle with regarding our relationships with others is how to continually reinvent what it means to be 'in dialogue', as a variable process of collective inquiry. We know we must think carefully about who is included and excluded in relation to which structures, working against polarization with our individual abilities to be vulnerable and moved by others. This work is difficult and requires perseverance and mess. At some point boundaries are drawn, either on purpose or due to external constraints, regarding who exactly we are in dialogue with. Who is able to participate in a dialogue and who has the power to make decisions about this? ACKnowl-EJ researchers involved in one study engaged in dialogue with 'locals', but also questioned, 'who qualifies as a true local?' Is it someone whose ancestors are from this same place? Someone who has lived there their whole life? Someone who moved there as an adult but is now solidly rooted in the community? What if there are internal divisions regarding this?

3. Relationship to knowledge

Strategic Representation

Representation--the way we present what we know about the world--holds within it the relationships between the world and our knowledge of it (Bhaskar with Scott, 2015 pg 30). Dominant modes of representing knowledge may be inaccessible and unable to hold the ambiguity and complexity of the knowledge that is produced.

Bhaskar (2015) asks that we "... see our representations of the world as part of our process of understanding it, explaining it and potentially changing it". How and to whom does research need to be communicated to serve its transformative purpose? One way to do this is through 'arts-based representation formats' which can be used to '...disrupt and deconstruct the traditional idea(l)s along with the perceptions of legitimacy associated with such neat and tidy packages' (Nolan (2014, p. 519). Finding ways to represent transgressive research is not just about adding the final frills, but a radical part of doing research that is aligned with the longing of the world. The way we present our ideas can help reduce remoteness for our audience/readers, as well, by bringing them to a deeper, empathetic understanding of an issue at hand. We should strategically design our outputs in a way that will truly speak to our target audience, while staying true to ourselves, in order to have a more transformative impact.

Activity

The Tiny Book process, facilitated by Kuany Kiir Kuany and Dylan McGarry.

During the research school it became increasingly urgent to adequately hold and honor the complex, rich, and thickly described narratives that were bubbling to the surface in the social learning space. We needed to find a way to hold onto this richness and depth, but also to simplify and democratize how we shared these knowledges. Inspired by an existing movement of indigenous knowledge captured in the form of a tiny book "Encuadernacion" and a suggestion from Prof. Heila Lotz-Sisika to "make something simple", we devised a process of creating tiny books that spoke to one aspect of our stories we were carrying.

What makes these tiny books so powerful is that they all fit on an A4 double-sided single sheet of paper that is easily folded three times into a tiny A7 pocket-sized, 16-page illustrated booklet. They are cheaply and easily reproduced and require little technical skill or equipment.

What inspired us the most was how complex, contextually nuanced and evolving knowledge(s) could be easily and simply explained and shared in these tiny books. Leah Temper, for example, manages in her tiny book to offer a simple framework for engaging with power through a series of thoughtful and satirical questions.

Find the tiny library at this link: http://transgressivelearning.org/resources/

Dylan lends us a **Pearl of Wisdom** regarding our relationship with knowledge, as he tells us to:

Stay with the trouble (Haraway, 2016). Have patience with complexity and the complicated.

Like the Nqonqotwane (dung beetles) in Africa, who stay with the hot smelly mess they find in their world, rolling shit into something more useful, for them, and for others, we too need to be comfortable with "Staying with the trouble" and finding a research/action process that allows us to roll with the shit, without getting queasy or over-eager to sanitize and perfume the smelly mess. This sentiment is inspired by Donna Haraway (2016:1), whose book with the self-same title, calls us to move beyond our obsession with "futurism" and technological fixes. Our positivist addiction with direct immediate outcomes and tangible deliverables in Sustainability Science could be keeping us from the tangible reality of the problems we are trying to 'solve'. Inspired by Steve Biko who quotes Dr Kaunda in his seminal text 'I Write What I Like':

Africans being a pre scientific people do not recognise any conceptual cleavage between the natural and the supernatural. They experience a situation rather than face a problem. By this I mean they allow both the rational and non- rational elements to make an impact upon them, and any action they may take could be

described more as a response of the total personality of the situation than the result of some mental exercise. (Biko 1978, 48)

Therefore, "staying with the trouble" means staying with the experience of a situation, to constantly make the effort to understand the entire personality of the context, and its historical/cultural activities. From these small, careful and politically rigorous (Temper et al. 2018) transgressive and transformative actions we as early career humxns can develop research that is reflexive and fosters incremental ontological shifts (changes in ways of being/existing), rolling along with the 'trouble' like the dung beetle.

A **Thorny Question/s** Anna, Kuany and Lena put forth is*:*

If all knowledge is co-created, how do we innovate within that?

As the concept of 'co-production' of knowledge gains popularity in the social sciences, particularly in the field of Science and Technology Studies (Jasanoff, 2004), we humbly remember that all knowledge is co-created. It is also pertinent to reinvestigate, everytime, what it means to say knowledge is co-created: what is co-creation beyond an intellectual affirmation? What does it look like in action? While single authorship is lauded in academia as more prestigious than multiple authorship, we question- what makes someone an author? Whose knowledge is represented in our writings? Even if one person sits down to write alone, completely isolated, are their ideas not influenced by countless interactions, conversations, and shared moments with other beings? And if they are, how does one ensure that the writing does justice beyond mere broad and detached citation?

That being said, we also believe there are a myriad of ways to actively approach knowledge processes from a more collaborative perspective. The critical social sciences and research conducted outside of academic institutions are rich with examples- militant science, participatory action research, and more. By centering

the idea of co-creation in our research processes, we bring attention to the countless relationships involved. We see that diversity is strength (Lorde, 1984), and that collective action- debate, critique, and what Borras (2016) calls 'political peer review', can deepen our understanding of the world around us.

4. Relationship to the Earth

Land connectivity and embeddedness

Many of us, with significant amounts of formal education, feel our relationship to the land is abstracted in the ways we learn about it and research it. We learn 'about' the land in siloed disciplines. This resonates with the concept of remoteness and a phenomena highlighted by decolonial theorists considering colonial trends in environmental education, where the land is treated as a neutral space upon which education happens or environmental work occurs (Tuck et al. 2014). Choudry (2015), speaking of his activist work in Aotearoa, notes his early frustration at how environmental movements are often unwilling to pay attention to the historical injustice relating to the land upon which more typical environmental injustices such as nuclear testing occurred. This frustration links to a deep contradiction where particular (and narrow) understandings of the environment pave the way for solutions that fail to engage with the colonial and capitalist injustices that lie at their root. As Tuck et al. note, "[p]laces produce and teach particular ways of thinking about and being in the world". (Tuck et al 2014, pg 9 referencing Styres and Zinga).

Increasing connectivity and embeddedness to the land and thereby reducing remoteness is key to transformation: how can we truly fight for an environmentally and socially just world when we are not even deeply connected to our own places? How can we engage with places that are not our own through acts of interconnectedness and solidarity? Through process, our work should strive to

operate from a point of embeddedness, while our results should aim to decrease this remoteness in others.

Activity: a 'street walk'

During the Aulas we attended, via invitation, the annual anti-mining 'carnival' march in Armenia[14], a protest against multinational mining companies operating in the region and country. It is a call to all communities to refuse to grant permission to multinational companies who have signed agreements with the government to mine large amounts of land on the condition that they get consent from local people. This march is led by indigenous elders. Behind this formation followed hundreds of Colombians, dressed as birds, trees, playing drums, holding up slogans, carrying large flags representing the indigenous territory of the Quimbaya people. Through this experience of the visually and aurally stimulating carnival we felt the deep emotional affective love for the earth. This is a powerful state from which calls for justice might come. The march is a critique against capitalist relations to the land - a place that can be exploited for profits afar.

At this march we witnessed how sustainability struggles are led from a close relationship with the land. Thus acknowledging our relationship to the land is not just a matter of being respectful, it is crucial to working for deeper, inclusive and subaltern-led sustainability justice.

Anna and Lena offer a brief **Pearl of Wisdom** regarding our relationship with the Earth, in which they suggest *(re)appropriating the concept of 'Field Trip' and 'Field Work' to enact a more subversive, solidarity-based, grounded engagement with one's surroundings.*

Wherever you are physically present, engage with local initiatives for change and resistance and find an appropriate way of participating. We want to reclaim this experience from the notion of a field trip. A field trip is often associated with an

14 http://www.colombiainforma.info/colombia-se-moviliza-por-el-medio-ambiente/

extractive exercise, where something is taken away and interpreted. We did not go to a field, we went to a street, and we did not take a trip, we walked, alongside many others, hearing their songs and calls and joining in when we learned the words. It is important to note that we were invited to participate in this space, as most of us from Living Aulas found ourselves in a territory that is not our own. Participation in acts of resistance outside of our own territories, or within our own regions but with folks facing different struggles from our own, can be a subversive act of solidarity, but may only be appropriate only depending on context and positionality.

The pedagogy of this 'street walk' is about practicing a being of presence. It was an embodied experience - a **land**ing; a body involved in processes of transformation, with others, with the earth.[15]

A **Thorny Question** we continue to grapple with regarding our relationship to the land is:

How do those of us relate to the land who have ancestral histories of colonization?

As we formulated this section some of us felt uncertain about how we can respectfully appreciate and learn from the wealth of indigenous and traditional knowledge relating to our relationships to the land. Our glimpse into various cultures from around the world alerted us to two different experiences: Those with strong links to indigenous communities felt a great sense of healing returning back to their ancestral ways of knowing; Those of us from cultures of 'whiteness' felt how impoverished we are in terms of ceremonies that nurture our relationship with the earth. We need to repair what some of our ancestors have broken. Resisting the temptation to essentialise our individual positions, the idea that we cannot learn our way out of destructive cultural histories, that we can only know if we are a

15 For example, iLand, an interdisciplinary dance project, has developed a methodology for experiencing ecologies and is based on the idea of the earth being an equal collaborator in the process (iLAND, 2017) The learning from this is to seek out local instances of resistance, join them in solidarity, hear their song, understand deeply their matters of concern and be aware of the space.

particular race, gender, sexuality (Carpenter and Mojab 2017); there is a sense in which this 4th relationship takes us back to the first one and allows us to think about this relationship both in terms of returning but also repairing.

3.3.5 Discussion & Conclusion

The relationships we write about here are always occurring simultaneously, closely interconnected to our experiences and understandings (Bhaskar 2016 pg 70). Our exploration of transgressive research for sustainability from a relational perspective resonates with Robinson's (2008, in Haider et al 2016) definition of 'undisciplinarity': research that is interactive, emergent, problem-based, reflexive, and centered on collaboration and partnership. Adding to the concept of 'undisciplined' methodologically grounded research (Haider et al. 2016), our digging offers four activities and reflections for working through the sticky mess of conducting *situationally grounded* research, in which the researcher understands herself as a learner constantly striving to conduct research worthy of longing, in order to help build a world worthy of longing. To do this, she roots herself in her relationships to herself, others, knowledge, and the earth. In this way, she works to counter the process of alienation central to capitalism, colonialism and imperialism. Her research can become a tool of resistance to the root cause of our socio-ecological crisis, challenging remoteness (Plumwood 2012) and the "condition of being separated of, split off or estranged from what is essential and intrinsic to a being´s nature or identity" (Bhaskar 2016, pg 70).

However,

"Beware of reproducing paradigms!" Kuany yells!

I am going to tell you a story:

One fine Colombian morning, with the bamboos and their fellow green friends dancing to the life-giving Andean breeze and the legendary colorful cock-of-the-rock and keel-billed Toucan chirping – as if greeting or mad at us - merrily, we sat in an open rooftop room of our serene abode. Some of us sat on the chairs, others grounded on the wooden floor that seemed entwined with the trees beneath and above. The space was one with the Earth – tree branches had no qualms poking us, a sort of a reminder, 'the invasion stops here'! The birds and lizards went around harmoniously as if permitting the equal sharing of the space. Our youngest co-conspirator, Sapphi, sent an urgent message that she needed her special meal, and as soon as the message was received, cuteness returned and peace prevailed.

Transgression required that all of us were as comfortable as we wanted – some were lying on the floor, I was attending an international meeting in shorts, t-shirt and sandals. Dylan was in his Dylan-organic-rags, Thomas looked as if only missing his farming tools to proceed with work and Injairu and Anna, leading the session, set an apt example. The agenda was as fluid as time and some sessions went on forever and others ended prematurely. We broke and mixed English, Spanish, and other usually suffocated languages – the resulting concoction was messy but comprehensible. For once, I wanted to be in a 'workshop'.

Do not worry; I am getting to the serious part:

After Injairu and Anna's session '(re) search worthy of our longing', we slipped into a deep discussion. You know one of those discussions started by 'what is an alternative?' and all of a sudden, you have to be reminded that it is lunch, and not knowing where you have reached, you take it to lunch? Yes. In fact, it would go on for days – 'how do we ensure that the alternative knowledge or action that we are proposing does not reinforce existing entrenched systems?' 'How do we ensure that alternative

knowledge or action is not reproducing paradigms (especially the sneaky, unconscious ones)?' Each question answered reproduced another question and on we went.

Larghetto, it started making sense. We struggled to find 'real alternatives' (those that do not reinforce or reproduce existing hegemonic structures) but the despair, at least for me, arising from a pseudo-impartial exercise of critical reflection, was massaged by the hope that with humility in knowledge and action, one can incrementally contribute to a systemic overhaul – even a total revolution. With constant questioning, especially of our well-intended interventions in the system, we can intervene in ways that do not reinforce or reproduce entrenched hegemonic structures. That was eureka for me. This lesson is one that I took back from Colombia, together with my extended family, one that I have been trying to inculcate in my personal and professional life.

After Colombia, I affirmed this to myself: "Dear me, the system of knowledge co-creation and co-consumption (for lack of a better word) and the resultant action for change worthy of 'takda', is circular and exists within one that is far more chaotic; each ripple disturbs the force – for better or for worse. In your daily interaction with fellow youth leaders, in your design of interventions to build peace; every time you set out to pull out an old diametric brick of knowledge intending to replace it with a concentric (Downes, 2012), fluid and relational one, be humble to investigate your motivations and self-reflexive (Jones, 2010) enough to peak into resulting consequences within the bigger system. But yes, do not stop."

My short story ends here. Pick what makes sense to you from what made sense to me.

As a group we also reflected on the large-scale cultural and structural changes within our knowledge production institutions necessary for effective Transformations research. We called these our dreams and demands for institutions and funders, which included:

1. Increased validation and generation of space and resources for other forms of research and being a researcher. Recognition of the knowledge and research capacity of realities different from that of academic institutions. Having patience and permitting the emergence of new ways of respecting rhythms and times of a process, allowing the sustenance of new paradigms and putting them into practice. Support long-term research that values process over product!

2. People-led design and evaluations of research processes. Involve those implicated in the research to design and evaluate the process, not just the institution or funders.

3. Fluidity and flexibility as methodology and design. Build-in room for uncertainty and time to stay with the trouble.

4. Prioritization of collective processes, work with and overcome the dualities between individuality and collectivity. Operate with intellectual generosity while also respecting boundaries.

Our vision for a transformative space of knowledge production, where the tensions and paradoxes between what we say and what we do is addressed, culminated in a vision for what we call the Pluriversity. The Pluriversity, further expanded on in a chapter co-written by many of these same authors (McGarry et al. 2021), is a constantly evolving utopic vision for researchers-as-learners, not individually, but relationally. We are living in a world where change is occuring, and our wish to change social institutions requires that we all double-down on living and

researching as learners. This paper offers a few simultaneous exploration points for foregrounding the idea of researcher as learner - not as individual - but in relationships.

In the end, we hope that our Living Aula's Activities, Pearls of Wisdom, Thorny Questions and general reflections can further conversations for a relationship-centered transformative knowledge paradigm truly worthy of our longing, as the upcoming generation of Transformations researchers. Continuing to grapple with the thorniness surrounding each relationship is essential to develop and practice transformative work. By reflecting on these four relational aspects of research, we continually work to understand and track our own learning journeys, manage and navigate challenging and fruitful dialogues and power dynamics, grapple with uncertainty and murky 'trouble', and (re)connect ourselves to the Earth and territories we are engaged with in subversive and transgressive ways.

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3.4 CHAPTER FOUR

Out With the Old/I See It In My Dreams. Commentary on Social Change. Analog Collage, 2021. Lena Weber.

Co-production of knowledge for environmental justice: Key lessons, challenges and approaches in the ACKnowl-EJ project

3.4.1 Introduction

> 'It motivates me to feel like academia can be useful, relevant for communities that are living through situations of injustice. It motivates me to help build justice in the world...I do not like to do investigations that don't generate change. I am motivated by the idea of transformation….I wouldn't feel at all comfortable only doing investigations to edify and systematize. I do not think it is ethically correct.' -ACKnowl-EJ researcher

Activist-Academic Co-production of Knowledge for Environmental Justice—The ACKnowl-EJ Project's full name—describes who we are (a mix of activists, academics, activist-y academics and academically inclined activists), what we fight to transform in our worlds (environmental injustice), and how we aimed to go about doing so in this research project (via an approach called co-production). Following what some have termed the 'participatory turn', we count ourselves among those researchers working with and being part of social movements who aim to disrupt and upend some of the traditional power relations often embedded in the research and knowledge production paradigms.

As a network of scholars and activists with ties to academic institutions, non-governmental organizations, communities and social movements, ACKnowl-EJ aimed to engage in action and collaborative analysis of the transformative potential of community responses to environmental and social injustices, particularly understood through the lens of extractivism, and alternatives born from resistance. The project was an experiment in co-producing knowledge that could answer the needs of social groups, advocates, citizens and social movements, while empowering communities to push for change. Teams within ACKnowl-EJ were made up of co-researchers from communities and movements around the world, and drew on research conducted in India, Turkey, Bolivia, Canada, Belgium, Lebanon, Venezuela, and Argentina. The network was co-coordinated by Kalpavriksh, an environmental action organization based primarily out of Pune,

India, and the Institute of Environmental Science and Technology (ICTA) at the Autonomous University of Barcelona.

Research for transformation is akin to science fiction, or magical realism; it is a way to collectively dream about and build realities different from those we are currently in. With the complex challenges we face, more typical ways of doing research just aren't up to the task of both understanding *and* transforming the world to a more socially and environmentally just place (Saltelli and Functowitz 2017; Lotz-Siskita 2016; Temper et al. 2019). Transformations researchers aim to build radically different futures than those that fit into a 'business as usual' mindset—ones actually worthy of our longing (Future Earth 2014; Blythe et al. 2018; McGarry et al. 2019; Bell and Pahl 2018).

A wide variety of terms are used for this work including activist scholarship, militant research, participatory action (Chambers 1983, Fals-Borda 1986) and decolonised (Smith 1999) research and more recently, co-produced (Temper et al. 2019) knowledge. The term 'co-production' tends to be associated with Science and Technology Studies (Galopin and Vesuri 2006), a fairly young field that examines knowledge societies and the connections between knowledge, culture and power (Jasanoff et al. 1995). Jasanoff (2004, p. 2) defines co-production as 'shorthand for the proposition that the ways in which we know and represent the world (both nature and society) are inseparable from the ways in which we choose to live in it.' The concept of co-production helps us highlight power, knowledge, and expertise in 'shaping, sustaining, subverting or transforming relations of authority.' (*Ibid*, p. 4).

Environmental justice, on the other hand, is a movement born out of Black and Brown communities in the United States experiencing and resisting disproportionate pollution and contamination of their environment compared to their white counterparts (Bullard 1993). Since the 1980s, the movement has both spread around the globe and has been pushed (and pulled, sometimes against its

will) into academia—replicating and adapting the theories and terms it birthed (Martinez-Alier 2014)—and has also come into contact with countless kindred, though unique, movements, creating a cross-pollination effect.

While the term co-production is widely deployed in trans-disciplinary research, the meaning, process and values behind co-production are rarely questioned or explicitly outlined. Moreover, in the ACKnowl-EJ project we aimed to engage in transformative, Co-produced Knowledge for Environmental Justice (CKEJ), a type of co-production that has yet to be defined and explored. Therefore, we offer this chapter as a reflection and analysis of our research processes, centered on a few key questions:

1) How do we define CKEJ—what are its key characteristics and when and how do we believe co-production processes hold the most transformative potential?
2) What are CKEJ's key values?
3) What obstacles and challenges do we face in realizing our ideal versions of co-production processes and how can we address these?

To do this analysis, ACKnowl-EJ researchers engaged in on-going reflexive activities to document our research practice, the concept of co-production, our ethics and processes, and relationships with ourselves, others, and knowledge production over the course of the 3.5-year project. We offer the following reflections as an act of transparency and honesty for ourselves and those we have worked with throughout this project, as well as for others engaging in similar processes: 1) a definition of Co-Production of Knowledge for Environmental Justice (CKEJ), including key aspects and transformative potential 2) an outline of this type of co-production's key values, and 3) identification of some of CKEJ's key challenges and ways to navigate these. Before turning to these results, the next sections review the literature on co-production and environmental justice as well as our methodology.

3.4.2 Co-production and environmental justice

Co-production as a term grew from participatory urban and regional planning and public service provision (Barken 2010; Ostrom 1990, in Bell and Pahl 2018), often traced to Elinor Ostrom's work from the 1970s (Palmer and Hemstrom 2020). It emerged as part of an increased interest in participatory research called the 'participatory turn', greatly motivated by the idea of 'wicked problems'; problems that are complex and unsolvable if only using conventional science and planning, like climate change, terrorism, and loss of biodiversity (Rittel and Webber 1973, in Palmer and Hemstrom 2020). Wicked problems emerge at the intersection of how they are framed, the creation of a goal, and an ambition to move towards equity. Researchers, grappling with how to tackle wicked problems, argued for the value of more collaborative approaches to knowledge production.

Participatory research was seen as holding potential to address three connected necessities surrounding these complex issues (Felt et al. 2015, in Palmer and Hemstrom 2020): the need for knowledge democratization, the need for an epistemology enriched by multiple knowledges in order to better address complex current issues, and the need to legitimize knowledge production by making science and its institutions more accountable and relevant.

In the 1990s, 'transdisciplinarity' also became popularized as an approach for tackling issues found in post-normal science. Advocates of trans-disciplinarity argue for the need to recognise multiple legitimate perspectives. This is a problem-oriented, real world-based approach that involves non-academic actors and emphasizes practicality (Palmer and Hemstrom 2020). The involvement of those with first-hand knowledge and experience of the issue at hand is key, which Corburn (2003) calls the legitimacy of local knowledge. Corburn argues that we should not over-romanticise local knowledge, but instead shift from the idea that

science ‘speaks truth’ to society, to a more ‘democratic’ perspective that we ‘make sense’ of things together (Sclove 1995 in Corburn 2003).

One powerful way of ‘making sense’ together happens in social movements (Cox 2014), with a key characteristic being the tension between what Gramsci calls ‘common sense’ (stemming from hegemonic relationships) and ‘good sense’ (stemming from popular practice) (Gramsci 1991, in Cox 2014). Particularly rich learning happens when movements come into dialogue with one another, creating a ‘talking between worlds’ effect (Conway 2006, in Cox 2014).

Environmental justice movements are a prime example of how diverse movements converge and come into dialogue with one another. In contrast to mainstream environmentalism, environmental justice movements avoid uniformity (Schlosberg 2004) by tackling multiple root causes of the social-ecological crisis (Di Chiro 2008, Schlosberg 2004), building off of pre-existing and intersectional anti-racist, feminist, and economic justice movements, among others.

This is because environmental justice as a concept grew from Black and Latino communities in the United States struggling against multiple and intersecting injustices at the same time. Later, environmental justice also grew in popularity as an analytical framework to understand how diverse factors like race, age, gender, and class affect how communities are impacted by environmental injustices. Activists involved in environmental justice movements—now much more globalized and in dialogue with other, similar movements—have theorized and coined many of the key concepts used by academic researchers today, including climate justice, ecological debt, leaving oil in the soil, biopiracy, etc. (Martinez-Alier 2014, Temper et al. 2015).

The richness of this type of meaning-making shows how collaborations between activists and academics through approaches like co-production can create fertile ground for understanding our realities and building more just futures. However,

while there is a rigorous body of research on the challenges of trans-disciplinary co-production (Lang et al 2012; Pohl and Hirsch Hadorn 2008; Pohl et al. 2017), there is no general agreement on terms/definitions, standards for researchers and funders, and processes and methods have to be tailored to specific problems and contexts (Palmer and Hemstrom 2020). Further, there is a lack of attention to how co-production specifically oriented towards increased environmental justice works in practice, and how researchers engaged in these processes navigate their own ethics and the challenges and opportunities presented.

3.4.3 Collectively Reflecting on and Documenting Co-production

Within the ACKnowl-EJ project, we engaged in different approaches to co-production. These included work on the EJAtlas, an online map of environmental conflict and justice movements designed, contributed to and analyzed by activist and academic communities from around the world; co-production processes in which ACKnowl-EJ team members formed part of the social movement/community engaging in the research; processes in which ACKnowl-EJ team members collaborated with communities/social movements of which they were not directly a member of; and the co-production of knowledge that occurred between ACKnowl-EJ team members in our structured and informal spaces of analysis and reflexivity. This variety of co-production processes relied on using already existing participatory methods, adapting them, or creating new ones for the specific purpose of the research.

Table 1: Examples of innovative CKEJ methods used by ACKnowl-EJ researchers

ACKnowl-EJ researchers used numerous methods in their co-production processes. Here we highlight several innovative approaches used as part of broader methodologies. While we present these as examples of methods for reflexivity, analysis, strategising, and evaluation, they are all plural in their potential uses and possible ways of implementation.

Method for reflexivity: The Tarot Activity

The Tarot Activity, developed jointly by Dylan McGarry from the T-Learning project and Lena Weber and Leah Temper from ACKnowl-EJ, aims to operationalise radical reflexivity by guiding researchers through a variety of existing and emergent alternative and critical approaches to research before asking them to use collage materials to reflect on their own identity, positionality and ethics as a researcher and represent this in an artistic manner. The exercise creates space for reflexive exploration into each researcher/activist's unique and plural expressions of their roles and actions, both ideal and actual, that were generatively surfaced.

It can play a key role in CKEJ research design by coaxing out important reflections and allowing for more intentional shaping of the type of role(s) the reseacher(s) will engage with, as well as reminding them which ethics and power dynamics they will need and want to attend to.

Readers can find more information on the Tarot Activity and how to replicate it or adapt it in Temper et al. (2019).

Method for empowering: Power analysis as part of the Conflict Transformation Framework developed by Grupo Confluencias

Grupo Confluencias is a network of professionals from Latin America working together since 2005 in order to jointly investigate and develop capacities around understandings of power and culture in environmental conflicts and their transformation. The Conflict Transformation Framework aims to strengthen a community's capacities to transform the environmental conflicts they are affected by through strategically targeting three types of hegemonic power (structural power, cultural power, and actor-networks). The resulting analysis and actions can help pull up the roots of environmental

injustices, by challenging harmful dominant legal, political, and economic structures and discourses.

In particular, this lens for understanding power can help CKEJ processes differentiate amongst types of hegemonic power while also identifying power of agency and strategies to impact upon and transform hegemonic power. Using this method for power analysis is very complementary to other methods used in CKEJ processes aiming to be transformative: in order to change something, and to know how to change it, we first have to understand what we're dealing with and what strengths we have at hand.

Participatory analysis was used in the Lomerio case study in Bolivia to systematize all the strategies of transformative power the Monkoxi Indigenous peoples have used over the last three decades to gain territorial control and property over their lands. The method was adapted from Hunjan and Pettit (2012)

M*ethod for self-evaluation: The Alternative Transformation Format*

The Alternatives Transformation Format[16] is a tool developed over many years through Kalpavriksh's Vikalp Sangam process to help initiatives and organizations to self-assess how holistic and integrated (or conversely, inconsistent and fragmented) their actions and transformations are, and where they may want to make changes. Five overlapping 'petals' guide us through possible indicators of ecological wisdom, integrity and resilience, social well-being and justice, direct and delegated democracy, economic democracy, and cultural diversity and knowledge democracy.

This format, not for use by external actors or for extractive purposes, can also be applied in diverse ways and moments by groups wanting to check in on and/or increase the transformative potential of their project/movement. It is

16http://www.vikalpsangam.org/about/the-search-for-alternatives-key-aspects-and-principles/

also a useful tool for research communities/teams to reflect on the strengths, weaknesses and possible blind spots of CKEJ projects; activities using the format were held at the final ACKnowl-EJ project meeting and with the Living Aula's alternative research school group for self-analysis and reflection on our own CKEJ processes.

More information on the format can be found here: http://acknowlej.org/understandingtransformations/#section-alternatives

Method for strategizing: Back-casting and scenario-building

Scenario-building was used in diverse ways over several case studies. In Turkey, the research team built a historical analysis with participatory scenario planning in order to co-create outputs of greater strategic relevance for members of the Yeni Foça Forum[17], a specific demand from Forum members involved in the project. One useful output was the visualization of historical struggles in the region, which then fed into scenario planning as a way to dream of alternative futures while recognising structural limitations. The team used the back-casting technique in order to see how these alternative futures can come into being, instead of just what *could* happen. This focused the process toward idealized outcomes. Researchers described how this 'two-pronged approach' of both looking backwards and forwards allowed them to explore the various and often-disputed ways of thinking about time in transformation research.

Scenario-building has exciting potential as a CKEJ method due to the innumerous context- and community-specific ways it can be designed and implemented, and the role it can play in movement planning and strategizing to reach transformative goals. Researchers from this team relate it to the type

17 The Yeni Foça Forum is one of the neighborhood forums (social movements that were created to protect rights to the city) after Gezi, established in the industrial zone of Aliağa bay, a key industrial site that has turned into an ecological sacrifice zone since the late 1970s. In 2016 amidst a 'carbon rush' the Forum occupied an unused privatized beach and established a commons while opposing fossil fuel investments.

of action-research called for by second-order transformation research, which emphasizes the connection between the researcher and research 'object' while creating space for imagination and experimentation (Fazey et al, 2018). This method is also a good way to facilitate reflexivity, by holding space for collective thinking—even amidst urgent issues and needs.

Method for future visioning: Three Horizons—the patterning of hope.

Similarly to back-casting and scenario-building, Three Horizons is a practical framework for thinking about the future—and an exploration of 'future consciousness' and how to develop it, proposed by Sharpe (2013). It is a simple and intuitive framework for thinking about the future. It helps groups explore systemic patterns to identify which of the dominant patterns are no longer fit for purpose, how emerging trends can shape the future, and what visionary action is needed to collectively move us towards a viable future. The future is explored through three lenses: Horizon 1: Continue Business as Usual, Horizon 3: Vision of a Viable Future, Horizon 2: Innovation towards the Vision.

This method was used in the Lomerio Indigenous Territory of Bolivia to help the Monkoxi indigenous people think strategically about their desired future. In a two-day workshop with community leaders and representatives from allied organizations, the Monkoxi explored the following guiding question: What transformations are necessary in the way we are managing our territory to consolidate our own government and a good use of our 'big house'? This overarching question was explored in greater detail through three Horizons.

Horizon 1 • What difficulties do we have in managing our territory to consolidate our own government and the proper use of our big house? • What is the novelty that we have done that we must maintain?

Horizon 3 • What is your ideal vision of the future of management of the

Lomerio territory in Bolivia to consolidate its own government and a good use of the big house? • What are the seeds that we have sown along the way to achieve this?

Horizon 2 • What new things do we need to do to get closer to this vision? • What do we have to stop doing?

This method is a good way to facilitate reflexivity about the positive aspects and achievements in EJ Struggles but also the challenges ahead to consolidate a desired vision of the future.

In co-production, reflexivity helps us stay on track for connecting the research process with the real-world problems we are trying to solve (Palmer and Hemstrom 2020). The methods for ongoing reflexivity applied to knowledge production in the ACKnowl-EJ project are referred to as our 'process documentation'. We define process documentation as *an active reflection on the knowledge practices involved in environmental justice struggles and research and our intention to transcend disciplinary silos and overcome the activist-academic dichotomy, while creating emancipatory theory and a new (critical) research praxis based on an 'ecology of knowledges'* (de Sousa Santos 2014). Our process documentation aimed to create spaces for documenting and analyzing the research we did in ACKnowl-EJ, across different levels of the project, from how we worked as a project and framed our research questions, to how we engaged with our case study communities. In particular, we aimed to inquire into the praxis of co-production of academic/ activist knowledge for environmental justice.

Through process documentation and radical reflexivity, we aimed to:

- Understand the thinking that went into the choices we made, individually and collectively (e.g. which case studies to select)

- Be more explicit about the biases we were starting with and introducing into our analyses
- Examine and learn from the hurdles faced and opportunities used
- Reflect on the tools being used and how we came to them
- Document and reflect on changes made throughout the stages of the case studies in research focus, methodologies, activities implemented, etc.

After jointly elaborating key concepts and a methodology for process documentation, ACKnowl-EJ researchers engaged in a series of reflexive activities and processes throughout the span of the 3-year project as a way to document—among other things—our decision-making, ethics, beliefs, and positionality surrounding our work. Key moments of reflection and documentation took place in presencial project meetings in Lebanon, India and Turkey, as well as from a distance through written prompts and interviews led by the authors.

3.4.4 Results

Our process documentation resulted in a collective definition of CKEJ, the identification of key values, and a deeper reflection on key challenges in CKEJ processes and possibilities to navigate these.

1. What is Co-production of Knowledge for Environmental Justice (CKEJ)?

We understand *Co-production of Knowledge for Environmental Justice* as an iterative process of back-and-forth questioning (dialectical and dialogical) with the potential to simultaneously produce facts, values, ideas and plans. It is visionary: it explicitly helps work toward a desired future that is more environmentally just,

helping to support alternative-building[18] while aiming to act as an alternative in and of itself.

This type of co-production implies the merging of two or more knowledge systems. It goes beyond learning and sharing to focus on creating. It is more than the sum of its parts. While knowledge is collectively produced all the time, we use this term to signify intentionality from all sides involved in the process. It challenges the binary between researcher and researched, and is condition- (time, space, etc.) and context- (culture, socio-political dynamics, etc.) dependent. This is a type of research that takes place with *groups* of people, not just between two individuals from different worldviews, for example.

The type of co-production we aspire towards is when: relationships are centered throughout the whole process in a way that works to diminish or eliminate harmful, oppressive and exploitative hierarchies common in research processes, different knowledge perspectives are brought into dialogue, and special attention is paid to power dynamics. It aims to be non-extractive. Those most affected by the environmental/social injustice(s) at hand and those most affected by structures of marginalization should be centered throughout with specific efforts made to elevate their perspectives, and strengthen their capacities, knowledges, and visions.

Co-production can happen on different scales and in multi-faceted ways. Indeed, we can say all knowledge is collectively produced in one way or another across space and time. Therefore, when we speak of 'ideal co-production of knowledge for environmental justice' we are only speaking about *one* type of co-production that we particularly strive for.

This type of co-production works better with long-term, trusting and mutually respectful relationships, and seeks to generate both externally and internally

18 By 'alternative-building' we mean the active creation/assertion of socio-ecological-economic structures that act as an 'alternative' to hegemonic norms in that they are more just in one or more spheres outlined by the Alternatives Transformation Format

reflexive spaces. It aims to support/facilitate the creation/diffusion of narratives that challenge the dominant worldview in all regards, including narratives of hegemonic development. It also seeks to produce diverse outcomes relevant for multiple audiences, prioritizing usefulness for the community[19] engaged in the process. It respects the community's own rules for negotiating and defining a research agenda.

We believe co-production has more transformative potential—both regarding the situation at hand and our research institutions—when it is immersive, strategic, socially embedded, opens up opportunities for sharing and deepening of connections between groups, and is designed specifically at aiming to challenge diverse/historical harmful norms common in research processes but rooted in broader historical systems of exclusion, discrimination, and exploitation.

This style of deeply engaged co-production allows for a 'peer review' process to take place *throughout* the knowledge production process—not just regarding final results—which can make the overall process more rigorous and impactful. These 'peer review' processes and tools should be easily accessible, learnable and usable to all the actors involved in the co-production process.

A key aspect of co-production with transformative potential is the collective formulation of the research motivation and question with those most affected by the issue at hand. This is because it ensures the research is in response to a vocalized need regarding transformation, that those closest to the issue are interested in and motivated by the research process, and that the process and results can be useful in working towards the desired transformation.

It should actively seek to facilitate spaces for mutual learning, validation of discriminated/differential viewpoints and knowledges, development of new

19 We use the term 'community' in a broad sense to refer to a grouping of people affected by and/or heavily engaged in the environmental justice issue at hand. The 'community' could be a town, a forum or organization, or a social movement, for example.

research skills for those closest to the issues at hand, sharing of knowledge from other spaces (e.g. organizing tactics that have worked in other struggles researchers might be familiar with), and broadening/strengthening communities' networks and alliances. It should allow space for evolving ideologies.

Table 2: Key Takeaway

Key Takeaway
Research Design: This definition of co-production can be used to help researchers and movements/communities design a CKEJ research project. Taken point for point, it can guide those involved through a series of considerations and things to prioritize while trying to foster a process with higher transformative potential. Space must be allowed for adaptation and addition of new, context-specific considerations.

2. What are the key values of CKEJ?

While some values are mentioned in our overall definition, at our final project meeting we discussed and agreed upon a more explicit list of values that we consider key to this kind of co-production.

These are respectfulness, authenticity, transparency, strategic inclusivity[20], active reflexivity and mindfulness, anti-hierarchy when it manifests in a harmful way[21]., humility, solidarity and sensitivity towards non-dominant timings, knowledges, and needs.

Consent (prior, informed, explicit) is centered, people's well-being and transformative goals are prioritized over institutional requirements, discriminated

20 Specific strategies are used to work to ensure inclusivity, for example separate meeting spaces just for women in one case study.
21 Including those in positions of power (including the researcher(s)) relinquishing control, letting go, and listening, but also recognising that authority manifests in different ways and is not necessarily always negative.

perspectives are visibilised/strengthened, and a balance is sought between commoning of knowledges and knowledge stewardship.[22]

Solidarity is key. CKEJ should be non-competitive, trust-building, transgressive (boundary-pushing), socially embedded and contextually specific, responsible and reciprocal, diversely justice-oriented, anti-extractive (of knowledge and resources), empowering of personal and collective agency, visionary, empathic, anti-colonial/anti-imperial, anti-assimilation/co-optation, and evidence-based.

Importantly, a final key value is plurality. That is, while we have identified these common values, they may look different depending on the research context and there is not one *correct* way to approach this type of co-production, rather, there is a plurality of variations and possibilities. Plurality is valued in many forms—of knowledges, of cultures, of methods, and beyond.

Table 3: Key Takeaway

Key Takeaway
Reflexivity: researchers interested in engaging in CKEJ processes can use this list of values as a discussion starter for themselves, their teams and the movements/communities involved at the start, during and after a research process. We suggest that they discuss the values they prioritize and how to embody them. For example, what does consent mean in this particular local context, and what is the most appropriate way for it to manifest? What are the needs around the balance between knowledge commoning and knowledge stewardship? How can we be visionary, and how can we conduct our research in an anti-colonial/anti-imperial way in this context?

3. CKEJ research and political rigor: Challenges and Opportunities

While a definition of CKEJ and a description of its key values are useful, the reality of CKEJ is much muddier. We identified key challenges of CKEJ

22 Recognising that not all knowledge is for everyone e.g. culturally-specific knowledge not appropriate for outsiders

throughout our process documentation. In particular, using the relational aspects of CKEJ as a lens, we examined three kinds of relationships: with ourselves, with others, and with knowledge. Due to the messy, overlapping nature of these relationships, one useful focus allowing us to understand the interplay between these relationships rests in the tension and complementarities found in our mixed activist-academic identities, and our pursuit of what Borras (2016) calls 'political rigor'.

Borras (2016) argues that political rigor 'means being politically informed and thorough, sensitive and nuanced, and timely and relevant. It should be the opposite of a postmortem way of thinking and doing things. It means taking a position on political processes that are being researched which in turn runs the risk of compromising the rigor of the academic dimension of the research.' In CKEJ, because of the emphasis on strategic, evidence-based work, 'academic' rigor is just as essential as political rigor. What is important is that the academic rigor is conducted and realized in a politically rigorous way, and while tensions certainly exist, our reflections show that the two can actually strengthen each other. For CKEJ, political rigor is delineated by the specific political needs of the affected community/movement, as well as by the key values and characteristics defined above.

The ACKnowl-EJ project team brought scholar-activists primarily affiliated to academic institutions together with those primarily affiliated to activist institutions, along with others affiliated to both types of institutions or to neither. This unique mixture provided insight into the challenges around these multiple, complex positionalities while attempting to conduct CKEJ research that was both academically and politically rigorous. Here, we highlight three of these challenges and offer insight on how to address them. These are:

1. The difficulties and opportunities around participation and heterogeneity in research teams

2. Navigating the ‘quadruple-burden’ faced by CKEJ researchers (to the movements and communities they work with, to their research institution, to the project funder, and to themselves—their own ethics and health), and
3. The holistic well-being of researchers involved in CKEJ projects.

We now turn to examining each of these separately.

3.1. Participation and heterogeneity in research teams

With inclusivity comes heterogeneity and possible conflicts between differing perspectives on the same issue. Heterogeneity was identified as a key strength of CKEJ processes, but attention must be paid to hierarchies and structures of marginalization, including those of gender and sexuality, within the groups engaged in the process. One challenge of these power dynamics noted by ACKnowl-EJ researchers was that they observed that some members of a group in one case were more dominant than others, which at times suppressed open conversation. In this case, they decided it would be better to hold separate workshops in order to include more perspectives, as well as including longitudinal individual interviews, as focus groups were obscuring the power relations present.

Those working on the development of the Arab Regional Map grappled with the question of language heterogeneity: what does environmental justice mean to people in the region? To some involved, the term ‘environment’ implied a place untouched by humans, a place ‘over there,’ while the term ‘land’ had more concrete connotations. The word ‘justice’ was also interpreted by some to imply a legal action requiring judicial courts. There were rich discussions and debates around these terms and the implications of directly translating English language words to the region.

CKEJ faces the challenge of the 'tyranny of participation',[23] with full inclusivity likely extremely difficult if not impossible in many contexts. Processes committed to being as inclusive as possible have to adapt to participants'/team members' lives and other commitments, which might impede progress and draw the timeline out indefinitely. In Bolivia, ACKnowl-EJ researchers reported that the limited number of people able to participate in discussions was a key challenge, as well as the fact that it was mostly leaders. They tried to ensure that the capacity-building process reached out to more participants by rotating locations. While this helped make the process more horizontal, it was still limited to a portion of the population more directly engaged in politics and with CICOL.

One central question raised was if/how research should be interventionist. Should research bias always be explicit to all parties from the start, keeping in mind that it could affect the study in unanticipated ways? One investigator's anti-war background and strong belief in the destructive impact of capitalism on humans and the natural environment shaped case selection and motivated the decision to create a feature map on militarisation and occupation in order to highlight the often forgotten long-lasting environmental impacts caused by this form of direct violence. The investigators working on the Lomerio case study professed a commitment to principles of social and environmental justice, particularly in Indigenous peoples' territories. They support Indigenous peoples' efforts for self-determination and autonomy, which they say creates a 'clear bias' in their methodology and research agenda. As with other ACKnowl-EJ researchers, they stated a belief that environmental justice research must be relevant and useful for those directly experiencing injustices, thus, their research design tried to go beyond knowledge generation per se to include reflexivity, dialogue and capacity building processes.

23 'Tyranny of participation' refers to both the mainstreaming and increasing hegemony of 'participatory research' derived from development studies (Kapoor 2005), as well as the fact that participatory processes that place a high burden (usually regarding time, if not also resources, energy, etc.) on participants can end up being exploitative and/or harmful. This burden can also exclude potential participants without the time/resources to fully engage (Gaynor 2015). If participatory processes do not engage with power and politics, they risk depoliticising local processes (Cooke and Kothari 2001).

ACKnowl-EJ researchers concluded that this type of co-production is a process of working out how different needs, research questions, and perspectives all fit together. It will likely be impossible to meet everyone's needs all the time, so difficult choices must be made, but those closest to the issue should have their needs prioritized. It is important to recognise that the ability to make these decisions is a privilege. The core research team will also likely have conflicting perspectives on different issues. In these tense moments, it is easy to fall (back) into pre-existing dynamics and norms around who has the ultimate 'authority' and power to make decisions and speak on behalf of others, but these are also opportunities to challenge these norms.

Furthermore, at times information might be brought up that some or many involved in the process do not want to be shared publicly. There must be dialogue around what to include and what not to include in research outputs, and for which audiences. We also have to be aware of risks of discrediting movements while still serving as a 'critical comrade' that can unearth and probe uncomfortable questions and in this way help advance transformative processes (Temper et al. 2019). The process overall must aim to be deliberately participatory. On one hand, if important information is suppressed due to power dynamics, conducting research in a more 'politically rigorous' way that facilitates space for more marginalized perspectives can also strengthen the accuracy and depth of the work, not compromising but rather strengthening its academic rigor. At the same time, not all information has to be included. Academic research regularly limits its scope in order to fit into publishing or institutional requirements, or simply the researchers' specific interests, without undermining the academic rigor of final outputs, and the same can be done in a politically rigorous process. Tensions certainly can arise, but it should not be assumed that there has to be a trade-off.

One strategy to help mitigate the challenges mentioned above could be to ensure a diverse research team that creates a balance between positionalities. Researchers

expressed that it was useful to have multiple positionalities within the same team ('insiders' of the issue at hand as well as 'outsiders') as it allowed them to both ensure a deeper understanding of the issues due to personal experience countered with a more 'neutral' or potentially critical outside perspective. Further, it is important to remain continually attentive to power dynamics within heterogeneous research teams (age, experience, affiliation to a research institution or community group). Whereas some researchers might contain elements, other teams might seek to work toward a similar perspective through open exchange and dialogue amongst diverse team members, though remaining vigilant against dominant identities occupying too much space and, in line with the key values of CKEJ, privileging those identities/voices that have been historically (and in general to this day) marginalized and discriminated against in research processes. Again, we see an example of how conducting research in a more politically rigorous way (ensuring and supporting research teams with diverse positionalities) can help avoid blind spots and foster deeper conversation, debate and understanding.

3.2. From 'double burdens' to 'quadruple burdens'

While the double burden and dual loyalties of scholar-activism have been commented on (Hale 2006; Borras 2016), our process documentation brought to our attention the deeper complexity of this issue. In research projects like ACKnowl-EJ there exists a more aptly named 'quadruple burden'.[24] These are responsibilities to/demands from 1. Institutions (the NGO/university/other institution that a researcher is affiliated to), 2. Project funders (sometimes a project is funded by the same institution, but often multi-institution projects are funded from an external source, for example an EU grant, which has its own requirements and expectations), 3. The movement/community/activist group they are part of/collaborating with, and 4. Themselves and their loved ones (their own ethics, needs for mental and physical health, family obligations, etc.).

24 In other CKEJ processes, researchers likely also face at least a triple burden, if not quadruple or more, depending on institutional affiliations, donors, number of communities/movements involved and the positionality of the researcher(s).

These burdens manifest in a variety of ways. There are often tensions between demands from research institutions/funders and movement/community priorities, including possible pressure from funders to prioritize fast academic and non-academic outputs (blog entries, for example), which can supersede more time-intensive community processes, or vice-versa (slower academic timelines vs. urgent movement needs). Researchers from one case study reported feeling like the daily needs and agenda of participants were more 'burning' than any excitement over their research questions, and that they are only marginally able to deliver on participants' expectations for immediate results and answers. ACKnowl-EJ members highlighted that the pressure of the academy to perform often overpowers activist commitments of researchers, and that the academic demands for nuances and objectivity and rigor can create tension for activism.

Regarding positionality and ethics, one researcher who works as a professor at a university explained: 'going to the field and doing research as [just an] academic is much easier because you go, ask your questions, get your sense of things and write. And this was a different relationship, we tried to not be there just as academics or people who "know things", (...) in terms of positioning ourselves it was more challenging'.

Regarding the tensions between personal ethics, donor expectations and community needs, another researcher lamented:

> 'we need outputs for the donors, and now with just a few months left I see we won't be able to complete what we set out to because our means and our ethics don't coincide with the timeline that the donors have given us. So which one do we give? And I am adamant that we don't give on the ethics perspective, so then what do we give the donors? How do we...develop outputs that are realistic and doable and important and yet humble. We maybe demanded too

much of ourselves within this time period. If we had demanded less maybe we wouldn't have gotten the grant to begin with. (It is a) double-edged sword.'

It is important to note that these tensions can also create richness. For example, when a donor is separate from a host institution, there may be more opportunities for cross-pollination and participation of actors from other institutions. However, donors and host institutions in particular must prioritize flexibility regarding outputs and timelines, for example, allowing outputs to be determined by the movements and communities participating. Increased seed funding to allow for the full research proposal to be developed collaboratively with movements and communities would also be helpful. In particular, ACKnowl-EJ researchers emphasized the necessity of collaboratively coming up with the initial research question. A strong, supportive research and project team can also provide space for difficult conversations while still supporting researchers to do their best work in line with their moral compass and community needs. Again, tension here certainly exists between academic and political rigor, but sacrificing political rigor for institutional requirements is a false solution. As argued above, a more diverse, inclusive, and attentive research process is likely time-intensive, but the result is a deeper and likely more accurate understanding of the issues at hand. Furthermore, researchers more in line with their own ethics and with time for their personal lives, are likely happier and healthier and at a lower risk of burnout (discussed below), which could lead to higher quality work, both academically and politically.

3.3 Holistic well-being of researchers

In large part due to the triple or quadruple burden faced by CKEJ researchers, along with CKEJ's politicized nature, there are important challenges to the holistic well-being of researchers. These include the risk of burnout, physical safety, job security, and the emotional toll this type of research can take on those involved.

Within the ACKnowl-EJ project, two proposed case studies had to be abandoned due to safety concerns because of local political contexts. Meanwhile, increasing authoritarianism in one country and fear of state coercion restricted the group involved in that case study's ability to grow larger, impeding their ability to transform local relations. However, this same authoritarianism, with its ongoing state of emergency, also turned to environmental movements for 'radical apertures' since already visibly political movements were easier to suppress.

The politicized nature of CKEJ can also cause job insecurity for researchers, depending on their context. In one country, the lead investigator had to leave the university they worked for partway through the project and therefore faced increased bureaucratic challenges, economic uncertainty as well as a loss of office space.

Our relationship to our own personal values as CKEJ researchers can also be tricky. On the one hand, one researcher reported her personal ethics were strengthened by being part of a group with shared values, though it was difficult to translate this commitment to values into practice in the field. Another researcher expressed that while there is often conflict between the way activist research and academic research is done, the fact that this project explicitly supported a combination of the two allowed for more flexibility: 'responsibilities towards' and 'relationships with' communities were more accepted. However, a third researcher noted that at times it was difficult to always work in coherence with her activist values due to either fatigue or uncertainty.

The emotional weight of CKEJ cannot be underestimated. CKEJ researchers' lives are often either directly implicated in the issues being addressed, or intertwined with those whose lives *are* directly implicated. These researchers witness and grapple with ecological devastation and very real threats against the physical and psychological integrity of those—sometimes including themselves—on the

frontlines of highly politicized environmental conflicts. As one ACKnowl-EJ investigator put it:

> 'This has been the only research project I've done where introspection has been a crucial part of the research. (....) I realized a few times during the meetings over the past few years that actually what I have been going through is extremely emotional and there is a lot of baggage I personally carry just because we are learning about this Earth, we're learning about tragedy and trauma and because of the things we are also personally experiencing.'

Another researcher spoke to the difficulty of writing about a situation while multiple assassinations were taking place of those directly implicated, saying that, while emotionally difficult, it made it seem all the more urgent to visibilise what was taking place. Informal conversations took place around the organization of project meetings due to the possible risks and implications for those participating whose governments might not view project activities kindly, and the possibility of surveillance or criminalisation of those attending.

We believe CKEJ researchers are at high risk of burnout, particularly when institutions and donors are less supportive of politically rigorous processes, which in turn risks lessening the 'academic' quality of the work they are conducting. Burnout studies have shown that a mixture of high job demands (role ambiguity, role stress, role conflict, stressful events, pressure and workload) combined with scarce job resources (physical, organizational, psychological or social aspects that help us reach our goals and engage in meaningful work) create burnout. In particular, a lack of fit between someone's 'personality' and preferences (which we frame as our personal ethics in CKEJ) and job demands (demands from institutions, donors and communities/movements) can cause much greater stress (Bakker and Costa 2014).

Burnout limits our ability to process thoughts, focus on new and global information, and affects our decision-making, but can be remediated in part by increased social support and freedom to craft our own work (ibid). Our process documentation highlighted how these challenges to the psychological and physical well-being of CKEJ researchers could in part be helped through strong extended peer networks. The networks and relationships created through ACKnowl-EJ and within research teams were noted as a key outcome and strength of the project. One researcher stated that 'there were times that the team...when we weren't these researchers working together but during particular times it was friends supporting each other. The research grant gave space for this.' Another shared that within her research team, due to the amount of time they spent together, they were able to build personal bonds and provide each other with emotional support. A third referred to ACKnowl-EJ as 'a sort of family', saying that 'other projects don't really have that, it is always professional relationships, but this project is more personal, you can approach people, express your issues and your angst. I don't know in how many other projects that sort of relationship is there. There is openness, flexibility, trust, warmth, that is great and that is different from my previous research experiences when it involves multiple partners.'

CKEJ researchers with strong social support and greater freedom to work in line with their ethics, prioritizing community/movement needs, are more likely to easily reach their goals of both academic and political rigor.

Table 4: Key Takeaway

Key Takeaway
For institutions and funders: Reflections on these challenges show that institutions and funders should support heterogenous research teams, give greater flexibility surrounding timelines and outputs and allow CKEJ researchers to prioritize the needs of the communities and movements they are part of and/or collaborate with. Close attention should be paid to mitigating the quadruple burden faced by researchers, and to facilitating activities and funding that promote the creation and social cohesion of extended peer communities that provide key support to

researchers engaging in emotionally, physically and morally complex environmental justice work.

3.4.5 Conclusion

Reflecting on our own ACKnowl-EJ process documentation, we believe we have addressed a key gap in the conversation around co-production of knowledge by explicitly defining one particular type of co-production (CKEJ), identifying many of its central values and key challenges, and identifying some ways to address those challenges and strengthen CKEJ processes. Our research affirms Borras' (2016) assertion that the interplay between different types of scholar-activists, while little understood, can play a key role in social transformation. We also deepen our understanding of a common issue amongst environmental justice scholar-activists, which is how to conduct theoretically sound political work, and politically sound academic work on environmental justice issues (Weber et al. 2020), and shed light on three key challenges in CKEJ researcher's attempts to conduct politically and academically rigorous work.

Our findings include the argument that extended peer networks play an absolutely central role in this type of activist-academic collaboration, not least of all because strong extended peer networks likely improve the psychological and physical well-being of CKEJ researchers, who face unique emotional and intellectual challenges as well as concerns around physical safety, and therefore help create more sustainable and long-term practices. Diverse positionalities within the same research team is a strength, though heterogeneity also necessitates active work to counter potentially harmful power dynamics. CKEJ researchers in the ACKnowl-EJ project faced a quadruple burden, and donors and host institutions must be aware of these tensions and should be more flexible in their timelines and expectations for outputs.

Affiliations to research institutions and donors offer strategic opportunities, but they also cause tension. In particular, more often than research institutions, obligations to donors created pressure to compromise the ethics of research teams and put the integrity of the CKEJ process at risk. However, flexibility on behalf of the project funders was celebrated, especially the financial and logistical support for building relationships. There are many ways funders could better support more effective CKEJ research. For example, maintaining a legal support fund in case of criminalisation of research teams or those they work with, a psychosocial support fund, built-in childcare at conferences and meetings, funds for an external trainer on anti-oppression, building the mitigation of negative power dynamics in research into the design phase, a sort of 'Ombudsperson' available to help address issues as they arise, support funds that can be applied for in case of losing one's job due to conducting research on politicized topics and the possibility of relocation support if researchers face risks to physical safety or legal threats. These and other measures would provide a more solid foundation for future groundbreaking and boundary-pushing transformations research.

SECTION 4

Light in the mess. Navigating the journey. Painting with geranium petals, 2021. Lena Weber.

4. DISCUSSION AND CONCLUSION

In order to urgently address the current socio-ecological crisis, we desperately need to understand, develop, and teach more effective ways of doing research. Transdisciplinarity, Transformative Science, and Environmental Justice are well-situated to tackle wicked problems, particularly in dialogue with one another. By addressing key gaps and conversations within these fields, we can strengthen our understanding of an environmental-justice approach to transdisciplinary, transformative research that can better guide us through the complex challenges we currently face. At the start of this thesis, I overviewed these approaches and identified the specific gaps and conversations I aimed to contribute to:

-Regarding Environmental Justice scholar-activism, I identified an opportunity to deepen our understanding of common threads across plural movements and approaches, as well as the usefulness in examining how these researchers and their networks navigate the political and academic aspects of their work.

-Regarding transdisciplinarity and co-production of knowledge, I identified an opportunity to better understand how co-production processes work when specifically oriented towards increased environmental justice, and the key values, challenges, and avenues for support for this type of research. I noted that new understandings of the roles of researchers in knowledge production processes could be visibilized and examined, particularly regarding the engagement of extended peer communities. Furthermore, I aimed to respond to calls for attention to the operationalization of reflexivity in transdisciplinary approaches to change-making, particularly around the norms and values at play in research processes.

-Regarding Transformative Science, I identified an internal tension and crossroads, with some practitioners following a mainstream, sustainable development approach, while others embrace a more critical stance focused on environmental justice and alternatives to development. In response to the call for

new, innovative transformative science methodologies, I saw an opportunity to strengthen the critical identity of transformative science and urge it away from a more pragmatic, sustainable development-oriented path by centering environmental justice. I also noted the usefulness in more clearly identifying challenges to this type of research that slow its adoption and diffusion.

Seeing the overlap between these approaches and conversations, I noted the relevance of exploring structured (rather than uncritical) methodological pluralism for environmental justice approaches to transdisciplinary, Transformative Science. To do so, I collaborated with three global networks of environmental justice-oriented transformations scholar-activists in order to collectively reflect upon their work, using a relational lens and particularly focusing on how these researchers conduct explicitly value-imbued, political work in a rigorous way. As a result, this thesis fleshes out common values, principles, relational aspects, defining characteristics, challenges, and needs for this type of research. I argue that what we called 'Co-production of Knowledge for Environmental Justice' in Chapter 4, which I now propose we call Collective Nurturing of Knowledge for Environmental Justice (CKEJ), should be considered a key methodology within the structured methodological pluralism of environmental justice-oriented transformative science. I also provide examples of methods for operationalizing reflexivity and exploring these ontological and axiological questions across (un)disciplines.

The research questions I worked with were:

1. What are the key principles, values and challenges of a transdisciplinary, relationship-centered research praxis for socio-ecological change-making?
2. How can we conceptualize a methodology for a relationship-centered research praxis aimed at transforming the current socio-ecological crisis?

Sub-research questions:

1.Which values and principles are common across diverse critical approaches to research for transformations?
3. How do environmental justice-concerned transformations researchers navigate relationships -with others, with themselves, knowledge, and the Earth- -in their work for change-making?
2. How do environmental justice-concerned transformations researchers navigate the political and academic aspects of their work?
4. How can we teach and learn this type of research?

Below, I outline the answers to these questions via the conceptualization of the methodology. I first explain the name change, then provide an overview of the methodology and specifically examine the relational aspects, the concepts of political rigor and politically rigorous peer review within extended peer networks, and methods to teach, learn and implement this type of research. Finally, I examine the methodology through the lens of the Alternative Transformations Format and wrap up with suggestions for future research.

4.1 Conceptualizing Collective Nurturing of Knowledge for Environmental Justice

4.1.1 Why the name change?

While finishing this thesis, something continued to feel not quite right about the name for this methodology. While the term co-production has a rich history, and served us well as a way to frame and foster a particular type of work within ACKnowl-EJ, I think we strive for something different. On one hand, production makes it sound like we are cogs in a machine. On the other hand, I do not believe transformations researchers strive to *produce* knowledge, or understand their work in that way. Based on the extensive conversations with transformations researchers over the past five years, I would call what they do *collective nurturing*. Knowledge

is gathered, shared, tended to, stewarded. A critique could be that the term 'nurture' does not convey the urgency with which transformations researchers work to address these pressing, complex crises. But I would argue that they nurture amidst crises, they nurture despite crises. They resist false urgencies (pressures of funders and institutions, publish or perish metalities), and instead tend to real urgencies identified by those on the frontlines of environmental justice struggles. They leverage non-dominant knowledges, but they do not *produce* these knowledges. They nurture and visibilize knowledge strategically, politically, wisely, and they do so with their hearts on the line. The researchers I worked with are full of love and rage, and are, perhaps entirely across the board, anti-capitalist. They and those in their extended communities are so much more, and yearn to be so much more, than cogs in a production line. However, I use the same initials throughout (CKEJ) to propose that what the ACKnowl-EJ project collectively defined as Co-Produced Knowledge for Environmental Justice is one and the same as Collective Nurturing, though the conceptualization in this conclusion incorporates insights from the other chapters and networks beyond ACKnowl-EJ.

4.1.2 CKEJ as a Methodology

By weaving together the results from the main chapters, CKEJ begins to take form.

I orient this conceptualization as departing from an emergent axiology. Axiology has to do with the values that connect ontology, epistemology, methodology and methods, and with what a paradigm considers to be intrinsically worthwhile (Heron and Reason, 1997). The common axiology identified in this thesis can thus be seen as that which can connect CKEJ to critical approaches to transformative science and research more broadly, as one methodology within an ontologically coherent, structured methodological pluralism (with the ontological position being critical realism as understood by Bhaskar (1975)).

From this axiological perspective, we can see the values section in the below chart

as our point of departure for CKEJ researchers. The values shape the defining characteristics, the challenges arise from conducting research in line with these characteristics, and the necessities arise from the challenges.

VALUES → DEFINING CHARACTERISTICS → CHALLENGES → NECESSITIES

Table 5: Trajectory for fleshing our CKEJ departing from axiological perspective

The below chart, which gathers the insights from each chapter, builds off of the results of the reflective, multi-year process within ACKnowl-EJ to reach consensus on a definition for CKEJ. It incorporates insights from the other three main chapters, thereby offering a broader definition informed by transformations scholar activists outside of just the ACKnowl-EJ network. It is organized in order to show the relation between values, characteristics, challenges, and necessities as laid out above. It can thus be useful for anyone wishing to gain an overarching view of CKEJ, and can be a point of departure for research teams wishing to practice this methodology. Notably, the section on avenues for funder and institutional support shows what must shift in order for CKEJ to flourish.

Table 6: Collective Nurturing of Knowledge for Environmental Justice

Values (Axiology)	Defining Characteristics
● Anti-hierarchy (in reference to harmful hierarchies) ● Authenticity ● Respectfulness ● Transparency ● Strategic inclusivity ● Active reflexivity/mindfulness ● Humility ● Solidarity ● Sensitivity towards non-dominant timings/knowledges/needs ● Non-competitiveness ● Consent as central ● Importance of visualization/strengthening of discriminated perspectives ● Need to balance between commoning of	● Iterative process of questioning ● Visionary (towards increased environmental justice) ● Aims to support alternative-building; Creation-oriented (beyond learning and sharing) ● Process itself aims to act as an alternative form of knowledge creation ● Socially-embedded and contextually specific (situationally and methodologically grounded) ● Well-being and transformative goals prioritized over institutional requirements ● Coherently Plural ● Dialogue between at least two

knowledges and knowledge stewardship ● Boundary-pushing/Transgressive ● Responsibility ● Reciprocity ● Diversely justice-oriented ● Anti-extractivist ● Empowering ● Empathic ● Anti-colonial/anti-imperial ● Anti-assimilation/co-optation ● Valuing engaged dialogue ● Land connectivity ● Strategic and just representation ● Valuing of movement-informed education ● Accessibility ● Reciprocity	worldviews (held by at least two groups of people) ● Relationships are centered in order to reduce remoteness ● Centers those most affected by the environmental injustices and those most affected by structures of marginalization ● Works better with long-term, trusting relationships ● Generates external and internal spaces for reflexivity ● Challenges dominant worldview and narratives, including challenging harmful norms common in research processes ● Ground-up design of research question and agenda ● 'Peer'-reviewed by extended activist/community peer networks ● Fosters spaces of mutual learning, skill/strategy sharing, and alliance building ● Non-static; evolving ● Evidence-based ● Trust-building ● Politically rigorous
Key Challenges	**Avenues for Support from Institutions and Funders**
● Holistic well-being of researchers due to complex and politicized nature of environmental conflicts ● Specific risks of burn out, risks to physical safety, risks to job/economic security ● Navigating the 'tyranny of participation' ● Tension between extended timelines and urgent needs ● Decision-making around prioritizing needs	● Institutional flexibility regarding timelines and outputs. Support and expect fluidity and flexibility in methodology and design. ● Support to develop/maintain strong extended peer networks ● Active support for building and maintaining heterogeneous research teams ● Measures to mitigate quadruple burden ● Active support to avoid and attend to

● Navigating heterogeneity ● Handling sensitive information ● Navigating the triple/quadruple burden ● Decision making around outputs ● Navigating explicit and implicit bias (recognising this exists in all research and isn't negative but may be more explicit in CKEJ) ● Navigating tensions and possible trade-offs between academic and political rigor. ● Navigating the plural aspects of political rigor that may shift from a local to global level	burnout ● Attention and support for physical safety of research teams (funds and training, emergency support, flexibility around changing research plan) ● Support for challenging and navigating harmful power dynamics and research norms ● Mitigation of threats to job security/economic security of researchers ● Awareness of and measures to mitigate risks of criminalisation of those involved in research process ● Increase validation and space/resources for alternative forms of research, including non-academic forms of research. ● Have patience and permit the emergence of new ways of respecting rhythms and times of a process, allowing the sustenance of new paradigms and putting them into practice. Support long-term research that values process over product. ● Increase support for people-led design and evaluations of research processes. Involve those implicated in the research to design and evaluate the process, not just the institution or funders. ● Prioritize collective processes.

The guiding axiology is visionary: it is a utopian perspective in which utopia is a state of environmental justice and is journey/process-oriented. The values are

something we strive for, culminating in a vision of an environmentally just world. It is also plural and context-dependent. The terms used here are those that were surfaced by the research networks engaged with. However, these terms can still mean varying things to the researchers involved, while for others they may use a different term for a similar concept.

For researchers wishing to practice CKEJ, this table can be a point of departure for discussion, and be used as a foundation for research design and politically rigorous peer review (explored more below). For example, it could be used as a tool in initial collective research design processes in which members of the research team and extended peer network first engage in the Tarot activity to surface their own key guiding principles and values, and then compare to the values present in the above table. They could discuss overlap and/or tensions, and the plural understandings of the terms they are using from a situationally grounded perspective. They could then discuss the list of defining characteristics, also from a situationally grounded perspective, and discuss how these characteristics can be integrated into research design. Discussion of key challenges, including possible other challenges they may face, can foster space for proactively strategizing around how to navigate these challenges.

4.3 Applying a relational lens: extended peer networks, political rigor, and politically rigorous peer review

Departing from an understanding that the current socio-ecological crisis is a crisis of relationships at a structural level, a key concern of this thesis was how transformations researchers navigate the relational aspects of their work, within and in relation to their extended peer networks. This thesis affirms that extended peer networks play an absolutely central role in this type of activist-academic collaboration, not least of all because strong extended peer networks likely improve the psychological and physical well-being of CKEJ researchers, who face unique emotional and intellectual challenges as well as concerns around physical safety,

and therefore help create more sustainable and long-term practices.

Extended peer networks are multi-levelled and multi-faceted. For example, the extended peer network of the EJAtlas is primarily made up of civil society and environmental justice organizations, students, academics, and to a lesser extent government officials, the private sector, and affected communities. The coordinating team is also a key player. ACKnowl-EJ network researchers formed part of the EJAtlas network, while also each having a case-study level network that included actors like local environmental justice activists, community leaders, other activist researchers, the ACKnowl-EJ level network, and the Transformative Knowledge Networks level, amongst others. The researcher and/or research team acts as the connector between the different levels of their overarching extended peer network, taking on diverse relational roles related to their positionality like the Co-Conspirer, the Critical Comrade, the Anti-Oppressive Researcher, and the Queer Enquirer. These are examples of the new roles that researchers are taking on in order to navigate the uncertainty and complexity of post-normal contexts.

Within these extended peer networks, researchers navigate the relational aspects of transformations research via a framework that we call *Political Rigor*. Political rigor considers that all knowledge production is historically, culturally, and politically situated, while 'guiding transformative activist-scholars through the tough choices they must make about where, with whom, and how they engage in their quests to transform the world.' (Chapter 1). It's a *relational framework*, in that sense, that aids in identifying, reflecting upon, and taking action regarding power relations for transformative goals. The conceptualization of political rigor shows us that these researchers aim to approach their relationships with radical, intentional, inclusive reflexivity.

Both scientific and political rigor have to do with substantiating assertions, building off of sources, and distinguishing between facts and interpretations. However, political rigor relies on a lens of power analysis and leverages non-

dominant voices, using scientific rigor strategically as a counter-hegemonic tool. Tensions between the academic and political aspects of transformations-oriented environmental justice work include certain trade-offs and ethical concerns. When tensions do exist, this thesis observes that transformations researchers prioritize the political aspects of their work. This doesn't mean the work isn't scientifically rigorous, since scientific rigor and evidence-based work are components of a politically rigorous strategy. However, when other 'academic' aspects come into tension with the political aspects of their work, for example competing demands between academic institutions and movements, the researchers tend to prioritize the movement demands. However, they often still meet the institutional and funder demands in order to be able to do so (because their funding depends on it!), and/or advocate for changes to institutional and funder requirements. This contributes to the 'quadruple burden' aspect of this type of work.

Political rigor as a framework guides us to use strategic reflexivity to navigate between the academic and political aspects of transformations research, via a process of social evaluation among an extended peer community. This iterative, continuous process is called politically rigorous peer review.

Because this type of peer review involves the co-definition and application of values throughout the whole research process, it can be seen as the method for developing and applying situationally grounded axiologies. This is essential, because, as discussed, the axiological values we map out in CKEJ are plural, context-dependent, and an initial conceptualization that could change or be further developed. Therefore, CKEJ researchers should not just depart from the above chart as a prescribed axiology, but instead use it as a reference for a specific (coherent), and situationally-grounded axiology determined through the political peer review process conducted by the extended peer networks involved. For example, what does inclusivity mean in your specific context? What harmful hierarchies exist that your research process will aim to counter? What does empowerment mean, and consent? What other values will your team use to guide

your work in a politically rigorous way? By coherent, I mean that an axiology that, for example, values private property above human life, or capitalist growth at the expense of the environment, could not be considered a valid approach to CKEJ.

4.4 How can we teach, learn and implement this type of research?

From the start, I aimed to make this a pedagogical thesis, in the sense of exploring and sharing how this type of research can be taught, learnt, and applied. As I mentioned in my positionality, I approach my academic work as a political project with a goal to contribute to changing how research is taught and supported, in order to become more transformative and impactful. Part of that is framing this work as teachable and aiming to make it accessible for facilitators, teachers, and students, with a particular focus on reflexive methods. As I worked on it I was also invited to give methodology workshops for masters students at a couple of universities, and so I developed facilitator guidelines to be able to share what I was learning with these students. The thesis also collected relevant CKEJ activities, ranging from reflexivity activities like the Tarot of Transgressive Research collage activity, to the methods used in ACKnowl-EJ case studies like scenario building, to the pedagogical activities developed in the context of the Living Aulas Research School.

(MSc. Human Ecology students at Lund University show their collages and poems created as part of a modified 'Tarot' activity I facilitated for a methodology course on activist research methods and frameworks, Spring 2019. Photo credit: Lena Weber)

For reference, the list below shows which activities are present in which chapters.

1. Chapter 1: *The Tarot of Transgressive Research collage activity* for researcher reflexivity is outlined and shared. This activity, developed with Leah Temper and Dyl McGarry, is useful particularly as part of research design, as it can help researchers reflect upon and identify their core values and thereby shape the axiology for the process. It could also be used periodically throughout a research process, or for students learning about critical methodologies as a way to learn and practice applying reflexivity.

2. Chapter 2: No activities as such are included, though there are insights regarding how students and teachers engage with the Environmental Justice Atlas, and how the Atlas can be used as a pedagogical tool. This is more deeply explored outside of this thesis in *Learning and Teaching Through*

the Online Environmental Justice Atlas: From Empowering Activists to Motivating Students, an article co-authored by Mariana Walter, myself, and Leah Temper, published in New Directions for Teaching and Learning's Spring 2020 special issue.

3. Chapter 3: Four co-developed researcher-learner pedagogical activities are presented that were developed/adapted in the context of the Living Aula's Alternative Research School for early career transformations scholar-activists. These are:
    a. *The Hero's Journey: personal and relational reflexivity in becoming transgressive and transformative researchers, facilitated by Dylan McGarry and Leah Temper.*
    b. *Unpacking language diversity and power, and "A future that is worthy of our longing", facilitated by Anna James and Injairu Kulundu*
    c. *The Tiny Book process, facilitated by Kuany Kuany and Dylan McGarry*
    d. *'A Street Walk', reappropriating the concept of the 'field trip' organized by Martha Chavez*

    These activities were useful for us, as early career transformations researchers, to explore the relational aspects of our work and surface the relational pearls of wisdom included in the prior section. Furthermore, the method for designing the school, facilitated by Martha Chavez (*dragon dreaming*), the approach to *collective writing*, and the method used within the school to co-design the experimental, peer-led activities above (*growing transformative research cultures*) are also all relevant methods for the creation and facilitation of generative spaces for peer-led learning on transformations research.

4. Chapter 4: This chapter highlighted several innovative methods used by ACKnowl-EJ researchers for implementing CKEJ, including:
    a. *Method for empowering: Power analysis as part of the Conflict Transformation Framework developed by Grupo Confluencias*
    b. *Method for strategizing: Back-casting and scenario-building*
    c. *Method for future visioning: Three Horizons—the patterning of hope*

    These methods offer tangible examples of how CKEJ researchers can use research techniques that work to strengthen the transformative capacity of the extended peer networks in the environmental justice movements they collaborate with or form part of. This chapter also presented *Process Documentation* as a method for collective reflexivity, transparency, and a tool to surface new knowledge based on learnings throughout a research process.

A future project will aim to compile and systematize all of these activities along with the numerous others not included in the text of this thesis so that they are easier to adapt and reproduce for others interested in teaching, learning and practicing CKEJ. However, the beautiful thing about this type of research is the openness for others to explore and develop their own methods.

Inspiration could be drawn from The Institute for Uncanny Justness and Dyl Mcgarry's decade-long work surrounding what they call 'suitably strange creative practice' (McGarry & Vermeylen 2018), bell hook's work on transgressive pedagogy (hooks 1994), Paulo Freire's Pedagogy of the Oppressed (Freire 1970), and Injairu Kulundu's work on transgression, transforming education, and decolonial praxis (eg Kulundu 2020), for example. Many of us involved in the Living Aulas school along with other co-authors wrote a book chapter called *The Pluriversity for Stuck Humxns: A Queer EcoPedagogy & Decolonial School*, published in the book *Queer Ecopedagogies* (ed. Russell, 2021), which dreams of a

pluriversity where methods like these could be taught and learnt with freedom, rigor and support.

By looking inward, drawing from our individual and collective embodied knowledges, embracing and nurturing spaces for radical reflexivity, research networks can collaboratively design creative methods that will be effective and appropriate in their contexts.

4.5 CKEJ in relation to Transformative Science and Environmental Justice

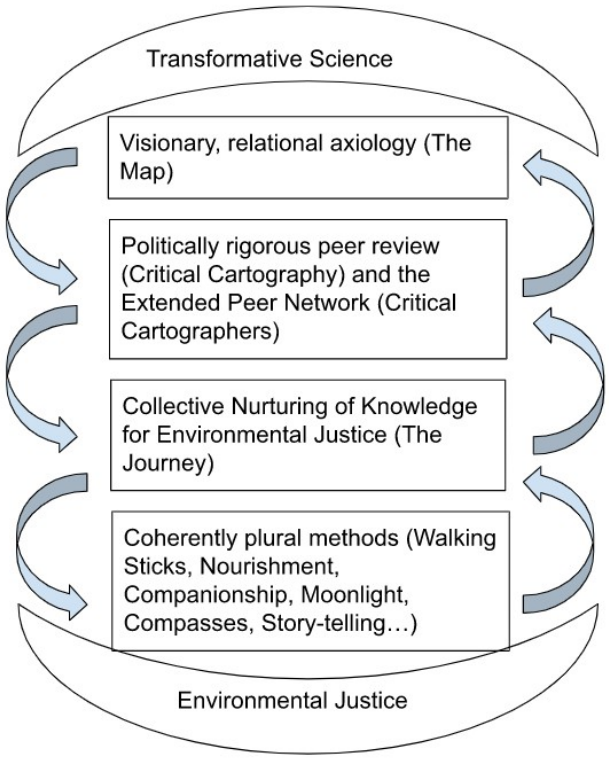


Figure 24: CKEJ as a journey within Environmental-Justice oriented Transformative Science

The figure above shows how CKEJ fits within an environmental justice-oriented approach to Transformative Science, inspired by creative activities like the *Hero's Journey* and *Tarot Activity*. In this image, I propose we think of the axiology as The Map; it is what fundamentally guides us on our journey. Extended peer networks can be considered Critical Cartographers of sorts: they do not map-make from above, but from a situationally-grounded perspective, and the politically

rigorous peer review process as Critical Cartography is an ongoing mapping and journey-weaving process that both departs from an axiology while feeding back into and informing that axiology. The methodology of CKEJ is The Journey itself, and the methods, while aligned ontologically and axiologically, are the infinite plural aspects that help us along the journey. These could be methods that help us rest and rejuvenate, methods that help us reflect on where we are, where we have come from, and where we are going, methods that lighten our loads or speed up the process, or help us avoid getting lost along the way, and methods that simply help us keep walking forward. All of these aspects are in a dialectical relationship with one another, continuously shaping and re-shaping each other. For example, while the Critical Cartographers map-make and journey-weave based on an existing axiology, their cartographic process also refines and shapes the specific axiology for their journey. Those participating in the journey itself also form part of this cartographic team, and will see things along the way that necessitate re-visiting the map-making and journey-weaving process. Likewise for the selection and use of methods. By sharing their learning processes along the way, they can also help other networks of Critical Cartographers hoping to embark on similar journeys.

4.6 Final thoughts and avenues for future research

4.6.1 Reflections on CKEJ as an alternative research methodology for transformations and looking towards a visionary future

As discussed, CKEJ as a research methodology aims to be transformative through process as well as results. As such, it works to act as an alternative to dominant forms of research by more effectively engaging in the necessary work of challenging dominant, harmful structures of power. As my closing reflections for this thesis, I would like to offer an initial, brief analysis of CKEJ's characteristics as an alternative in order to better identify its potential strengths and weaknesses as a transformative research methodology. This is not meant to be comprehensive but instead a conversation starter for future research. This, along with collective

visionings of environmentally just futures could set the priorities and agenda for future research.

4.6.2 Alternatives Transformation Format

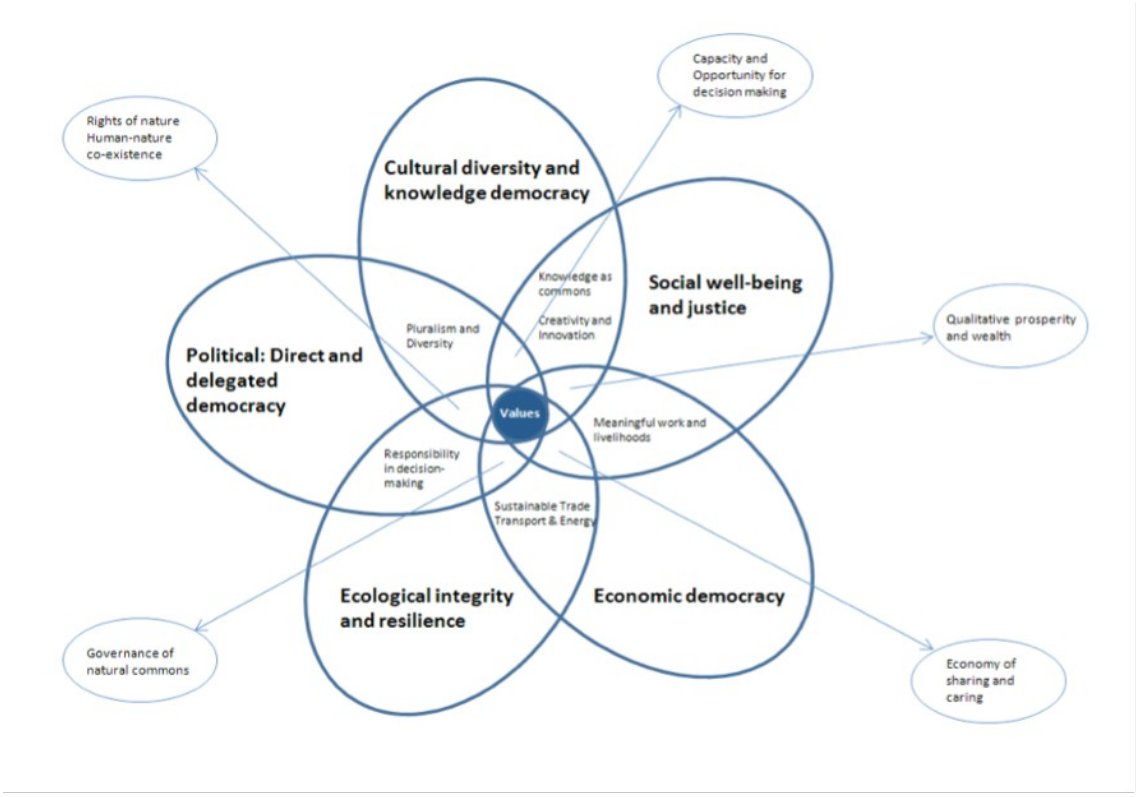
The Alternatives Transformation Format[25] is a tool developed by ACKnowl-EJ co-coordinator Kalpavriksh for use in self-assessment processes for alternatives and facilitation for radical change. It grew out of a desire to more deeply understand the diverse aspects of transformative alternatives, including their political, economic, cultural, social, and ecological dimensions, originated from the Vikalp Sangam (Alternatives Confluence) process/platform in India. Vikalp Sangam brings together groups and people working on alternative-building, and has resulted in the identification of key aspects and principles of the alternatives involved.

The format can help those engaged in alternative-building to identify whether their alternative can be qualified as transformative or simply reformist/a false solution. It can also help us more deeply understand processes of transformation and identify possible internal contradictions, thus enabling those involved in the alternative to address these contradictions and thus become more transformative. Though it emerged from India, it is proposed to have universal applicability.

At our final ACKnowl-EJ meeting, we began a reflection on our project as an alternative approach to research by using the Alternatives Transformation Format. Unfortunately, we did not have time to do a full, collective self-assessment with the format. And, without the participation of the rest of the network it would not be right for me to attempt to fully apply the framework to CKEJ as a methodology, though I think this would be a wonderful avenue for future research to nurture CKEJ as a holistic alternative. Therefore, I will just offer some very initial personal reflections on CKEJ as an alternative in line with the Alternatives Transformation Format and offer a proposal for a future collective self-assessment using the format.

25 https://kalpavriksh.org/wp-content/uploads/2020/07/Alternatives-transformation-framework-Final-Ver-for-public-revised-20.2.2017.pdf

Figure 25: Spheres of alternative transformation (*Note*: the topics mentioned in the overlapping areas are only indicative, not exhaustive)



Using the five petals of the format as a guide (for a full, fleshed out description of these spheres please consult the original Format), there are some immediate strengths and blind spots of CKEJ as a potential alternative that stand out to me. The focus on pluralism, collective decision-making, dialogue between worldviews, valuing of non-dominant knowledge, well-being of researchers and active reflexivity to counter negative power dynamics in research teams are all examples of how CKEJ could be in line with the top three petals in the diagram above. My doubts center more on the bottom two petals: Economic democracy and Ecological integrity and resilience. Though CKEJ focuses on environmental justice goals, this thesis includes few reflections regarding these two aspects. There is substantial attention paid to how funders can better support this type of research, but I think this is still a blind spot thus far in CKEJ and merits further attention. How is money distributed in research teams, and who plays a role in those decisions? How does

the research contribute to or actively counteract harmful economic structures in our societies? How does the research insert itself into struggles for socio-economic justice?

I believe another blind spot lies in how CKEJ manifests in practice as a more ecologically sound/respectful research practice. How does the research process itself impact the environment (impact of travel, use of technology, etc.)? How does the framework engage with the non-human natural world? How are the 'voices' of the non-human natural world 'represented' within the process (eg. rights of nature and other approaches)? How could the natural world be included in the extended peer network and the peer review process? How does it work to avoid the pitfalls of anthropocentrism? These are considerations that the networks of researchers involved in this thesis discussed in informal conversations but as of yet have not systematically reflected upon on a broader scale.

The Alternatives Transformation Format considers that to be called an alternative, a practice or initiative should be coherent with at least two petals without outright violating the other three. In this sense, I think CKEJ clearly holds promise, though further, collective analysis would be necessary in order to determine how CKEJ is currently operating and what would need to change in order for it to be considered a true alternative research methodology.

4.6.3 Concluding Remarks: Envisioning Environmentally Just Futures and Refining a Methodology to Help Reach Them

While rife with challenges, the visionary and utopian essence of CKEJ is of utmost importance. CKEJ is about both the journey and the destination of environmental justice, but because of its focus on challenging and transforming hegemonic norms through its process, the journey is also *part* of the destination. As it is plural and context-dependent, its visionary aspect must be tied to and born from the ground up, and thus the 'visions' of CKEJ transformation will also be infinitely plural.

Each manifestation of CKEJ must work toward its own utopia, even while connected to broader utopian imaginings (Bell and Pahl 2018). One way of understanding this is through the lens of the Alternatives Transformations Format, which helps us self-assess whether our projects are true alternatives to hegemonic norms, allowing us to see how they fit into broader anti-hegemonic ways of being and doing. CKEJ research teams could use the Alternatives Transformations Framework as an aid both in visionary design and reflexivity on their research process and outcomes.

CKEJ is an explicitly value-imbued form of research. It is visionary, creative, relational, reflexive, potentially transformative, collectively shaped and creates fertile ground for mutual learning. Those collaborating in CKEJ need to be aware that these processes often involve individual transformation, as noted by Palmer and Hemstrom (2020), but it must go beyond this in order to not become just another extractive research project.

Returning to Costanza's (2001) explanation that we need visions regarding how we want the world to look in order to solve the complex crises we face, an agenda for researchers using CKEJ could be to lean in to this visionary approach, using frameworks and methods like those surfaced in this thesis to dually strengthen our movements while tangibly mapping out our visions for environmentally just futures and strategizing to reach those futures.

On the methodological side, along with a deeper, collective analysis of CKEJ as a true alternative in line with the Alternative Transformations Format, there are several other avenues for future research. It would be useful to examine other networks of transformations researchers and engage directly with the communities and movements they collaborate with in order to test and refine these common foundations as well as gain more insights about novel and effective CKEJ methods. It would also be useful to incorporate more feedback and reflections from students learning and engaging in this methodology.

We also need to better understand how to navigate unique challenges faced by CKEJ researchers, in order to ensure the success and future of this methodology. These include security risks and the triple/quadruple burden faced by these researchers, and tensions between urgent needs and extended timelines, among others. Security concerns limited the research of multiple scholar-activists in the extended networks I worked with throughout my PhD. State and corporate repression are consistent threats to environmental justice and transformations researchers, and we must develop stronger ways to protect and support necessary research that puts powerful interests at risk.

Writers and activists Walidah Imarisha and adrienne maree brown argue that organizing is science fiction, and that we can build new worlds by dreaming the 'impossible' while looking to the past for inspiration (Imarisha et al. 2015). Similarly, we reiterate: CKEJ should be visionary and utopian, while also doggedly reflexive and, above all, plural. As Imarisha paraphrases Arundhati Roy in saying, 'other worlds are not only possible, but are on their way—and we can already hear them breathing.' CKEJ researchers must strive to not just listen to their breathing, but instead help pump fresh air into their lungs.

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ANNEXES

Annex 1: EJAtlas Survey Questions

Timestamp

What's your main area of activity? select all relevant

Please tell us your specific area of interest or expertise, give more details or if you chose other, please specify here

Please enter the name of your organization if applicable

Please enter your country where most of your work is based

What use do you make/have you done of the Ejatlas data? select all relevant

Please explain or share with us your experience in this and what strengths and weaknesses you have found

How often do you use /have you used the Atlas? If you chose "regularly for my work/research", please tell us more details

How did you find out about the EJatlas? select all relevant

Please explain. If you found out about EJatlas during a campaign or mobilization, please tell us more details here

Please rate the EJatlas website based on Ability to navigate within the website / accessibility:

Please rate the EJatlas website based on Organization of information:

Please rate the EJatlas website based on Appearance of the website:

Please rate the EJatlas website based on Quality / Accuracy of the website content:

Please rate the EJatlas website based on Interactivity of the website:

Please rate the EJatlas website based on Search, Filter, Browsing functionality: Please rate the EJatlas website based on Featured Maps:

What data/functionality is missing from the EJAtlas that you would add?

Do you have any other suggestions about improving the content and organization of this site?

What does Environmental Justice mean to you?

How would you define and what are the elements of a "successful" environmental justice struggle for you?

If you would like to contribute on specific cases on the map, please create your account on the website or leave here your name and contact. If you want to collaborate with us on

specific featured maps or have additional comments, please feel free to contact us at ejoltmap@gmail.com.

Thank you so much for your time and attention!

Annex 2: ACKnowl-EJ process documentation semi-structured interview questions

ACKnowl-EJ project activities process documentation

ACKnowl-EJ teams engage in constant process documentation and periodically submit written reflections on their co-production processes in an attempt to create a guiding tool for reflexivity for ACKnowl-EJ partners as we as we undertake case studies and work with the Environmental Justice Atlas (EJAtlas) including regional platform and featured map development.

To document our research processes, teams have been asked to:
a. keep some written documentation that can help answer questions on a regular basis; these
questions can be kept in mind while, for instance, preparing reports of meetings/consultations/field visits, etc. held during the case study or EJAtlas activity development
b. try also to have some audio-visual documentation of the process, especially things like field
visits, public meetings, etc.

A first set of responses was requested from each team on at least one of their ACKnowl-EJ activities in January 2018 (collated responses to this first round can be found at the end of this document along with our initial concept note). At an annual project meeting in Bir, India in October, 2018, different activities were facilitated to further reflect upon our research practice, the concept of co-production, our ethics and processes. A final session for reflection upon our processes will be held at ACKnowl-EJ's last annual meeting in Istanbul, April, 2019.

The following questions, to be answered before March 1st, will serve as a basis for our final activities in Istanbul.

Co-production
-What is your ideal vision of co-production, and when do you think co-production has the most transformative potential?

Relationships with ourselves
-what has your relationship with yourself (personal ethics, values, lifestyle, self-care) been like throughout this project? Has it differed from your experience in other projects/research processes? Has it differed from what you hoped for at the outset of the project? Why/why not?

Relationships with others
-What has your relationship with others involved in the research/project been like (team/project members, 'community' members, etc.)? Has it differed from your experience in other projects/research processes? Has it differed from what you hoped for at the outset of the project? Why/why not?

Relationships with knowledge

- What has your relationship with knowledge been like throughout this project? Has it differed from your experience in other projects/research processes? Has it differed from what you hoped for at the outset of the project? Why/why not?

Transformation of relationships:
-Do you feel that any of the above relationships mentioned have transformed throughout the research process? how so? As you set out to impact them or as a 'side-effect'?

Annex 3: Example of facilitation guide for the Tarot of Transgressive Research Collage Activity

I wrote the guide below for my own use for a workshop facilitated with Lund University MSc. students in Human Ecology, as part of their methodology course. The activity took place after two days discussing activist and critical approaches to research and application of activist research frameworks.

Tarot of transgressive research activity

1. Centering activity- read quotes by Octavia Butler and Arundhati Roy.

"There is nothing new under the sun, but there are new suns."- Octavia Butler, Parable of the Trickster

"Our strategy should be not only to confront empire, but to lay siege to it. To deprive it of oxygen. To shame it. To mock it. With our art, our music, our literature, our stubbornness, our joy, our brilliance, our sheer relentlessness- and our ability to tell our own stories. Stories that are different from the ones we're being brainwashed to believe. The corporate revolution will collapse if we refuse to buy what they are selling- their ideas, their version of history, their wards, their weapons, their notion of inevitability. Remember this: we be many, and they be few. They need us more than we need them. Another world is not only possible, she is on her way. On a quiet day, I can hear her breathing." -Arundhati Roy, War Talk

2. Hand out Tarot characters. Explain background of these characters- some based primarily on theory, others on researchers we know and work with in our network (Patrick Bond, Injairu Kulundu…). Have students each read one, then divide into groups of 7 (each group should have 1 person for each character- if extra students then some groups can have repeat characters. If not enough students then those with shorter character descriptions can read two). Present your character back to

the rest of the group describing: the name of the character, what you see as its strengths, its weaknesses, the connection between theory and real-life application, and for who/in what contexts this approach might be appropriate. Goal isn't to have a super deep understanding of each of these approaches and the theory behind them, but just to become familiar with some different critical ways of approaching research. If there is a particular character that jumps out to you, write down the name and the authors that are cited in the description to look them up later to learn more!

(While groups are working, the facilitator can set up collage materials to have things ready for the next activity. Lay out magazines, images, glue, markers, paint, scissors etc on tables and/or the floor for people to easily access.)

3. Return to full group. Explain that we are going to engage in a series of activities to try to tap into a deeper reflexivity and understanding of ourselves as researchers. It's like applying 'diversity of tactics' as a way to understand ourselves better!

Step one: naming ourselves. Ask everyone to close their eyes, and reflect on the characters they just read. Consider the different names they had. Now remember our discussions over the previous sessions. Your wants and needs, how those intersect with others...your priorities for impact...your interests. Now, if you were to name yourself as a research 'character', what would it be? Try to listen to your gut, don't overthink it, later you can change it. Write down the first thing that comes to mind. Once everyone has written something down, turn to the person next to you and try to explain what the name means. Often through the act of explaining what comes directly from our gut we learn something about ourselves that we may not even have realized we were thinking or feeling.

Step two: Begin the collage activity. Show examples from other researchers. Make a collage that represents you as a researcher, and the 'character' you have just named yourself as (changing if you feel you need to). Put music on to work to.

Step three: Once people are settled into their collaging and have made some progress (30 minutes or so), you can pause the music and ask the group to listen while you read out the pluriversity poem (while they keep working). Explain the context, the group around it. Make the connection between scenario building, visionary sci-fi, and the idea of dreaming of radically different academias. Even the act of collage and building a character of ourselves as a researcher can be seen as scenario-building...envisioning how we want to do research.

Ask students to pause their collaging and on another paper or the reverse side (or an empty space on the same side) write a short poem about their character (can be anything, poem just means it doesn't have to follow normal text patterns! A series of words, a haiku, some phrases, whatever they want). Once they have finished, they should share with at least one another person, if comfortable. The act of explaining ourselves again as a way to learn more about ourselves. Then students can continue to collage.

If they don't finish by the end of class, remind them that these are for them to keep and they can finish at home.

Closing activity: To add to written reflections from previous classes. What do you think the key ethics and values are of your research character, that you want to espouse throughout your research process? What are the main strengths and weaknesses you can foresee in your approach? Are there any other considerations you want to remember as you go forward? Write down these reflections.

Before cleaning up, remind participants that there are many different ways to approach research, including 'activist' research. The written reflections from the sessions along with their character 'tarot' are for them to keep, to help guide them forward and inspire them throughout the research process.

Leave contact information, make space for feedback, final questions...