Permaculture as an ecopedagogy curriculum and alternative theory of development: an exploration of the ecological consciousness of rural western Kenyan farmers using photo-voice with a farmer field school during COVID-19

David Yisrael Epstein
*University at Albany, State University of New York, davidyisrael@gmail.com*

The University at Albany community has made this article openly available. Please share how this access benefits you.

Follow this and additional works at: [https://scholarsarchive.library.albany.edu/legacy-etd](https://scholarsarchive.library.albany.edu/legacy-etd)

Part of the African Studies Commons, Environmental Education Commons, and the Systems Science Commons

**Recommended Citation**

[https://scholarsarchive.library.albany.edu/legacy-etd/2900](https://scholarsarchive.library.albany.edu/legacy-etd/2900)

This Dissertation is brought to you for free and open access by the The Graduate School at Scholars Archive. It has been accepted for inclusion in Legacy Theses & Dissertations (2009 - 2024) by an authorized administrator of Scholars Archive. Please see Terms of Use. For more information, please contact scholarsarchive@albany.edu.
Permaculture as an Ecopedagogy Curriculum and Alternative Theory of Development: An exploration of the Ecological Consciousness of Rural Western Kenyan Farmers using photo-voice with a farmer field school during COVID-19

By

David Yisrael Epstein

A Dissertation
Submitted to the University at Albany, State University of New York in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

School of Education
Department of Educational Policy and Leadership
May 2022
ABSTRACT

This dissertation explores two main questions of farmers in Western Kenya – how they see farming as a creative process and their role in that – and how change is made possible in their community. I explore stories from farmers themselves, using photographs they have taken and stories they tell about those photographs, which answer these two questions. In doing so, I attempt to understand the degree to which collective action has taken root in a community exposed to a permaculture based curriculum within a farmer field school. It also importantly seeks to understand what happens when such a curriculum takes an approach to improvement where the assumption is that the local population will understand their own community and problems the best. Perhaps at times that understanding will best occur with outside help to facilitate knowledge exchange, in order to be able to create their own leadership and educational capacity to solve complicated problems. This case study explores an example of an ecopedagogy curriculum and how such a curriculum may impact the ways that farmers tell stories about their identities and relationships to land, one another, resources, collective action, resilience, Gaia, agriculture, and development via a participatory action research approach to educational policy and leadership improvement.
Writing an acknowledgement page is an interesting experience. I'm well aware of the fact that not many people are likely to read this dissertation. Yet a decade of my life has been poured into this work. Dozens of farmers have given their time and stories to help make this possible. If I was able to list a co-author on this dissertation I would. Paul Omollo – you amaze me. You have been a blessing to your community, the passion and love with which you teach is an inspiration and you have been instrumental in helping me – not just have "access" to data – to stories – but to ensuring that the farmers always felt truly included, that this was their project. They are the creators of these stories. It belongs to them. The entire purpose of this project has been to elevate their voices, to listen, to better understand what they have to teach us, when certain ideas are offered via a curriculum, and how they then combine this with the knowledge that their local community has about how to identify their own problems and solve them.

You have been masterful at working as an educator and storyteller within your community, Paul. I cannot thank you enough. I'm so grateful to have met you and had the chance to begin learning with you and I hope this is but the beginning of the work we can do.

To all the farmers who participated to the end of this study: Emily Oslo Otieno, Emmanuel Wao, Eunice Auko Shikuku, Raute Hermann Henry, Jerry Wao, John Leonard Otieno, Lucas O. Raute, Monica Otieno, Phillip Ojwang Wao, and Valentine Otieno Ochuka, thank you for sharing your stories with all of us. Thank you for helping so many others to better understand your worlds, your dreams, your work, and ways that we can improve how we treat one another, how we create change, and how we can both create development, take
care of one another, and also attend to our ecosystems to leave a beautiful heritage to future
generations.

Hugh Kelly, the creator of permEzone – out of the kindness of your heart and a desire
to help attend to our Mother Earth and the humans walking around and struggling – you came
up with the idea for this organization to identify curriculum, technologies, and spaces in East
Africa where such a participatory approach to storytelling, education, innovation, and
application of permaculture could be possible and tested, to see if a different way was
possible, if regenerative agriculture, a return to our roots, and empowering local populations
with their voices to enact leadership could become a loud enough demonstration to others to
initiative policy change. The findings of this case study largely bolster the hopes you had for
your vision. You are a kindhearted man, and this project would never have materialized had I
not met you.

Sheena Shah – you touch the land and it flowers. You enter a room and there is more
stillness. You listen patiently, but when you speak, it is with wisdom. You walk gently and
are a wonderful leader, and the work you have done as an educator in the permaculture world
of Kenya is revolutionary. You are introducing and innovating new curricula, new ways (or
one could argue, very old ways) of thinking and being with Earth, one another, and our
fellow creatures. It is because of you I met Hugh and Paul. This project exists on your
shoulders. You are such a beautiful human. Thank you.

To the rest of the team who has helped along the way from permEzone, Community
Mobilization for Regenerative Agriculture, and previously Permaculture Research Institute
Kenya: Joel Simpson, Sabre Mrkva, Elin Lindhagen Duby, Georgina McAllister, you have all
been so instrumental in thinking this project through. Thank you all; what a team! You
accomplish so much for so many simply because you care.
To my advisor, mentor, and I hope he will be comfortable with me now saying friend, Dr. Aaron Benavot – I probably don't have the words to express my thanks for what you have offered me over these years. Doing a doctorate is challenging regardless. Doing it with a participatory design, I was told directly by other faculty, "is unwise and will add years to your degree" – and of course by contrarian attitude (and ethics), I said to hell with that and proceeded onwards, and tried to then complete it during a pandemic, and we all know how challenging that has been for our mental health and resilience. You have been a steady human for me throughout this process. You listened to me and had a meal with me when I had a complete breakdown from overwhelming amounts of trauma to deal with at once, including a severe motorcycle accident that left me wondering how I would write for a time. When the entire department changed buildings, you gifted me many books from a beautiful library you have curated for decades and, as a bibliophile myself, that is a gift I'll cherish the rest of my life. You've invited me into exciting research and publishing opportunities that allowed me to demonstrate my research skills and expertise to our field, and to push myself to stretch my own mental capacities, and introduced me to incredible, curious, playful thinkers in eclectic and intersecting fields who both care about Earth and humans, and apply rigor to the work. I could not have asked for a better teacher; you have brought the entirety of your humanity to our teaching relationship and I'm deeply grateful to you for this.

Greg Misiaszek – we met serendipitously because we were put on a panel together at a CIES conference out of our mutual interest in permaculture, eco-literacy, and finding ways to improve the human condition and still attend to healing the damage we have wrecked upon Mother Earth. You listened to my ideas, and as a senior colleague, took me under your wings, introduced me to your wife as we walked around Washington, D.C., and chatted. You have invited me into so many opportunities to think more critically about our field, to publish, and to simply join you from distances across the globe on a Zoom call to encourage me to keep
going when it was difficult, or to examine an idea together more carefully, or to simply talk
and share photographs of beautiful parts of the Earth we share and tell some stories. You've
become a wonderful friend, and I'm lucky to be able to call you so. Thank you for being a
teacher, for what you are trying to do in this world.

Alex-Kumi Yeboah – the words of encouragement you have offered me – the passion
with which you have expressed the importance of my work to Kenya and for much of Eastern
and Western Africa writ large due to similar climates and agricultural systems – deeply
touched my heart. Our conversations about agriculture, hope in the face of such systemically
difficult challenges, and what you have seen in me, have often kept me going when I felt very
alone and like giving up. I appreciate you.

Kristen Wilcox – you helped introduce me to the world of improvement science. It
has become an enormous part of my intellectual world. Much of my work life at University at
Albany ended up centering around this. In the twists and turns life takes us on, we end up
discovering beauty in places we don't know exist. We don't know what we don't know. When
I began my educational career, this was nowhere on my radar, even most of the way through
my doctorate. Yet it became so integral to this story, to a prism for how to help understand
the stories of the farmers with whom I am working, and for many of the courses around
vulnerability, trust building, and ways to find hope for improving our education system. You
introduced me to a new landscape and I will always remember you for that gift.

Kayla Johnson – we also met thanks to a CIES conference. I believe Esteban
introduced us – and your shining eyes that are so full of enthusiasm for life and the work you
do with Peruvian indigenous youth that you shared when we first met kindled an immediate
friendship. You are a storyteller, and this of course is manifested in the kind of academic you
are. I was inspired by your work, and was able to model much of my doctoral methods on the
work you have done using photo-voice and other storytelling methods to elevate social justice and the voices of those so often ignored within development. Listening to you in our conversations is what gave birth to many of the ideas in these pages. You've also held space for me when I needed a colleague to speak with when the demands and difficulties of navigating this degree where overwhelming, and you always made yourself available. Thank you so much for all of your energy and care for people.

Nancy Zimpher – where do I even begin? How lucky am I to have ended up working for you right after you stepped down as Chancellor. I had no idea what it meant at the time, truly none. Perhaps my absolute ignorance of Higher Education Administration is what allowed for us to have the relationship we do. You are the most amazingly humble leader I've ever known. You have so much wisdom and perspective, and yet you are almost always the person who most listens in a room, absorbing so much, and delicately determining how to synthesize complicated ideas, personalities, positions, to make the good enough solution for complex systems. As I was such an ignoramus about who you were when we first met, I simply greeted you as you, a human, without fanfare, and it allowed us to develop a real friendship. You appreciated me for me, for my mind, for my heart. And I simply love you, Nancy. You are magic; you care so much about people, and want so much to see humanity rise up and be their best versions of self. You believe in people. Having the chance to learn with you, from you, to develop courses with you and teach with you – I could not have possibly been more lucky in any doctoral program. Our conversations are a treasure for me.

Jason Lane – you gave me the opportunity to help create the think tank at University at Albany – the Systems Center. You brought me into spaces with giants in the Educational Leadership world – and it gave me a window into how educational leaders think and operate. It jump-started aspects of my career and gave me perspectives that most students do not have the opportunity to gain. It offered me the chance to learn how to engage in e-learning and
create micro-credentials – and to work more closely with Nancy. Thank you for believing in me and giving me these first steps in my new career. You came to our department with a bold vision for what new directions of educational leadership should be, including embracing decolonizing our curriculum and diversifying student and teacher pipelines, and you encouraged me to find ways to elevate pathways to such curricular and programmatic outcomes within complex systems. We need more leaders doing this work. Thank you for encouraging me to take stances that are still not always comfortable or popular within our systems.

Mitch Leventhal – what a delightful human you are, Mitch. Such a brilliant thinker, yet you never show it off; you are so still and calm. I entered your office never having taken a course with you, with a fair amount of hubris, and simply asked to talk and pitched you an idea for doing a research publication together. You smiled, and a friendship began that has lasted until today. We’ve begun exploring many new ideas together, and our conversations around philosophy and life are ever enriching. You’ve brought a great amount of growth and light into my life. I’m very glad I walked into your office that day and that you graciously offered me a chair and to have a conversation. Many a time I’ve reached out to you when the doctoral pathway has been rough, and after sharing stories with you, often over Stoic philosophy, the road is always brighter, calmer, more centered. Thank you.

To my therapist Adam Gorman – you have shepherded me through many waves – both highs and lows – and helped ensure I got to this finish line. You are a wonderful human, a wonderful man, and an excellent therapist – and I thank you from the depth of my soul. Thank you brother.

Georges Potworowski – my brother. Life is so funny. It can become harder to make friends as we get older, yet many of the people here I’ve met in my 30s and 40s in the most
unusual ways. We met playing volleyball, randomly assigned to the same team, playing rather poorly, and upon introducing ourselves discovered we shared a lot of academic interests. Many tennis courts, volleyball courts, and backyard hangouts later, you have become a dear friend. That you also are a scholar, with whom I've had the chance to work, think, and begin exploring the possibility of future work together – well – what more can we ask for in life? Whenever you saw me feeling particularly frustrated, we'd hit the tennis court and you'd just set me up with a smash hit. You are a hilarious friend in addition to a brilliant one. Can't wait for future adventures with you.

“Doc” Washburn – you have been a teacher and mentor of mine – perhaps better said, a guide – since I was a teenager. It has been such a serendipitous blessing to have you in my life for so long. We share much in our stories, and the gap in time between us has allowed me to learn so much from your perspectives. Yet as an elder, not an older, but an elder, you also are able to actually listen and be in dynamic learning with me. You are perhaps my greatest teacher. And also one of my most silent and still ones. Your attunement to Gaia and the indigenous wisdom and people, as well as the Jewish, where you draw your wisdoms from, has always helped me find a “home” when feeling untethered in spirit and mind. I’m grateful to know you are here, and people such as you walk the land.

Esteban Villalobos – another soul brother – how many nights have we spent sharing time together, often with some vinyl, literally talking all night about our academic ideas: Our hopes and dreams, our visions for a better world in which children can learn differently, be more free to explore who they are and want to be? Different designs for schools – for cities – ways to create more regenerative landscapes? Our thinking has become so intertwined – there's absolutely no way the ideas below exist without our conversations. You have profoundly influenced my mind, my heart, my soul. You are a blessing to everyone you offer your time to.
Harp - not sure how cosmos kept us apart in this life for so long, but hey – finally found you. It's amazing how much you have influenced my thinking in such a short period of time. How many travels of spirit have we already taken, brother? Your care for other human beings and the kind of love you want to offer is unparalleled. You have taught me much about what it means to love oneself, there is a line in Tehilim – Psalms 23:5: "...my cup overflows," followed by a sentence singing of "goodness and kindness," which many of our sages taught is meant to teach that only when our own heart is full, only when we have love for ourselves even in moments of darkness, only then can we be teachers and offer kindness and love towards others. An African proverb says, "Be wary the naked man who offers you a shirt." Maya Angelou said that she doesn’t trust people who don't love themselves and who tell her, "I love you." You teach others the power of loving themselves, and in turn, how to truly love others, as well. I learn a lot from you, elder brother.

Charlie Settens, Isaac Lund, Kevin Ryan, and Ana Gallira, I have lived or effectively lived with all of you for years at one point during my schooling or teaching years. You've all done advanced degrees in totally different fields, created families, made beautiful art Ana, and helped impact your communities. Our very different lives and ideas have pushed us to think differently and outside of our own bubbles. You often challenge assumptions I have; you help keep me honest. I appreciate you all.

David Hessing (דוד), Jeremy Scher, and Phil Erner, friends since childhood, we've all allowed one another to change and grow, and have all pushed each other to keep that edge, to stay honest to our inner voices, to be beautiful. David, thank you for bringing me home to Israel these past weeks when I was completely exhausted from having finished this degree and was collapsing. No one could ask for a better best friend since childhood. Jeremy and Phil – your random knocks on the door during this pandemic have brought me lots of joy. Your political leadership in Kingston is inspiring. Phil, as is the way you farm and treat
Earth. Jeremy and Phil – we've gone to battle together in protests for Earth to help stop fracking and pollution that is killing our soils, rivers, and creatures we share this land with. I'll never forget how you made music on jail bars all night Phil to keep us company with your voice and musical soul with folk songs about Earth and love to remind us of why we risked our bodies in bitter cold. Jeremy, Phil, and David, the way you all show up as partners to the women you love, and to children as fathers and men is beautiful. You are good men and I'm proud to call you my friends.

Xiomara Giordano – I am so happy you ended up enrolling in the course Nancy and I taught. I learned more from you, to be sure. The friendship we have created since then is precious to me; you constantly remind me of the essential importance of the work we are doing in education to decolonize spaces, to disrupt cycles of violence, to offer more peaceful and loving ways of being – and that we must work on ourselves continuously first to do this, that we must build community and support one another, because this kind of emotional labor in educational policy will be difficult, and this kind of change and collective action is often exhausting. You are one of the kindest people I know. It's a joy to watch you walk your land and attend to the animals and plants you care for and to make food for the woman you love. You are a gift to this world; you've taught me a great deal.

Jo Tang and Jess Ceravole – your bright shiny souls have helped my own to explore spaces it would have otherwise been too shy or awkward to consider. You are fearless spiritually and radically honest humans. The work I see you do, Jo, for Earth as an academic in bio-pesticide is beautiful, the work you do for your family to help heal, and the way you have taught me the love language of showing up and how you are present for your friends are lessons many of us could learn from. You are a fabulous teacher. Jess, our pathway has been beautiful and also difficult. I don't know that either of us would have had the same kinds of joy or ability to learn and grow as we did during this pandemic that has been so cruel on so
many in such different ways, had we not met one another. I struggled in many ways for
different reasons during the pandemic and our relationship and then friendship gifted me the
ability to experience life anew and keep learning and growing. You have a lot of love to share
with the world and are a great teacher who cares more for animals than anyone I've known.
You helped care for Tony, my canine companion of 12 years in his final year of life, and that
meant a great deal to both of us.

James McGhee – best friend since the day we met at the University of Chicago. Soul
brother. How many lives have we lived together? How many thousands of hours of
conversations, discussing so many books, experiences, loves, relationships, pains, traumas,
joys? How many dance floors? How many tears? My brother I know so few people willing to
truey explore the mind and soul like you – to spiritually take on what the fullness of being
human can mean. What does it mean to be a human being and citizen – to be a creator and a
force for good for oneself and others – to be love – if not that? You have taught me as much
about love as anyone I've known. "Lead with love" you remind me. Brother in arms always –
I am who I am because of you. Love you.

To my parents – wouldn't be here without you. I've accepted the cliché that many
aspects I resisted of wanting to be like you dad are exactly who I've become, and ways in
which I couldn't appreciate or see beauty in that as a kid I do now. You worked tirelessly as a
social worker growing up caring for people that society had thrown away as garbage. It often
left little energy for us, but you still made it to my sporting events, and our relationship has
changed a great deal as adults. I very much doubt I'd be in the fields I'm in now, had I not
watched you do what you did and care for people that others didn't while I was growing up.
Mom, you saw my wild child side as a young boy, and discovered how nature nurtured my
soul and calmed me. You created a club for me and my friends when I wasn't even yet five,
and we would go on hikes and learn about plants and birds and discover waterfalls in the
area. One of those waterfalls has become, unto this day, a sacred space for me and my friends. That love for time with trees and Earth, and caring for humans that others ignore and walk by, combined in me, into everything I have spent my adult life doing. I'm a product of you both.

Grandma and papa – you are the two greatest influences on my intellectual, emotional, and moral being. I don't know how you survived what you did and were still such joyous and beautiful humans. You had the most magical love I've ever witnessed, and I'll ever aspire to treat those I love this way. You always valued education, caring for Earth, and for others, I know you'd be proud of this moment in my life – and I'm thinking of you. I still grow your cacti, papa, and your flowers still bloom, grandma. I miss you every day.

To my partner, Elena Boland. I had composed an email to walk away from this doctoral program during the pandemic, I was so overwhelmed and felt like I needed to move on with my career and find a way to be more emotionally centered during such difficult times – and a PhD makes that very difficult. The work I do with the farmers could move on independent of this degree. I was feeling like a failure academically and suffering from imposter syndrome. You took me to Burlington for a date. It was a sunny day. We walked around and sat outside a Mediterranean Restaurant, as close to our Israeli home as we could get for a taste of home. You shared with me that I should do what felt right and you wouldn't judge me either way and were proud of me and the work I do. Then you also shared how you had felt the same way at times during medical school and how happy you were to have finished, and helped me think through, in detail, the path forward to finishing, despite all the obstacles, bureaucracy, red tape, and difficulties dealing with the isolation of the pandemic. Without that moment, I would not be here and this degree would have collapsed. Beyond that, you have brought a conscious partnership, a level of challenge to myself to grow and be better, a spiritual dimension to love, that I've never known before. I'm a better person because
of you, and I hope the love I offer in return brings you a similar joy. There are thinkers below in my writing, ideas below, that emanate directly from you and our conversations – as is true of so many of those mentioned in my acknowledgements. Your fingerprints are all over my mind and heart. You constantly challenge my thinking. Your children are gorgeous little hearts with big souls. I’ve taught over a thousand children and spent tens of thousands of hours with young people, but have never had the opportunity to bond with kids in this way. Seeing how you show up as a mother, knowing your story and where you come from, and much of the culture we share, and how you are disrupting so many cycles of violence and pain to create two beautiful humans who can find joy and love in the world as themselves, has given me so much to reflect on about what it means to be. To be a human. To be an educator. To be a good man. To be a good partner. Thank you.
# Contents

Acknowledgements .................................................................................................................. iii
List of Figures ............................................................................................................................ xxi
List of Tables ............................................................................................................................ xxii
List of Abbreviations: ................................................................................................................. xxiii
List of Definitions: ...................................................................................................................... xxiv
Prologue Part I: Reflexivity – How my biography informs this research project ................... xxvi
Prologue Part II: The rationale driving the answers to those curiosities – what to expect ...... xxix
Unapparent connection: Educational Policy & Leadership's relationship to regenerative systems and Gaia centered movements .......................................................................................... xxxi

Chapter One ............................................................................................................................... 1

Introduction ............................................................................................................................... 1

Two Critiques to Literacy for “Technology Transfer” (Aka The Human Capital Argument) .... 3
The Wicked Problem & Adaptive Leadership ........................................................................... 5
Trust, Relationships, Power: The Participatory Approach is at the Heart of Improvement Science..... 7
Improvement Science as an Interrogative Lens ........................................................................ 11
Reason for Selecting Western Kenya ....................................................................................... 16
This dissertation is rooted in the work of permEzone and C-MRA: The farmers of Asumbi ........ 18

Chapter Two: Literature Review ............................................................................................... 21

Preface ....................................................................................................................................... 21
Introduction ............................................................................................................................... 23

Section One: Ecopedagogy ........................................................................................................ 24

Building on Critical Theory, Eco-pedagogies extension into critical global citizenship ........ 24
Situating the human-animal within the bio-ecological sphere AKA Humans as Lovers of Life .... 29
Ecopedagogy, Wisdom, and Valuing Life: The First Research Question ................................ 37
A Time for Praxis: The Second Research Question .................................................................. 41
Ecopedagogy as Freirian Praxis - Moving Beyond Civilization: The Third Research Question .. 43
From Loving One Place to Loving All Place: Eco-Pedagogies articulation of home and love ...... 51
To Love a Place(s): The Fourth Research Question ................................................................. 54

Section Two: Agro-Ecology – The Rise of a New Agricultural Literacy ................................ 55
Permaculture Defined ................................................................................................................ 58
Permaculture Curriculum: What can I demand of this land? A Fifth Research Question ...... 65

Section Three: Farmer Field Schools ....................................................................................... 68
Why FFS in SSA Have Faced Unique Challenges: ................................................................. 69
PR&E as A Critical Literacy Approach to the Study of FFS in Africa .................................... 71

Section Four: Women’s Rights & Gendered Issues in Agriculture and FFS ........................... 74
Limitations of the Case Study Framework ................................................................. 146
Limitations of the Participatory Action Research Model ............................................ 147
Utilizing member checks in the data set ................................................................. 147
Peer Checks ............................................................................................................. 148
Role of the Researcher ............................................................................................ 149
Triangulation of Data ............................................................................................. 150
Methodological Tool vs. Analytic Frame .................................................................. 150
Methodology & Tool: Sense Making and Knowledge Sharing Utilizing Photo-Voice .... 151
On the nature of data collection & observations when utilizing photo-voice .......... 153
Phrasing the Prompt for Photo-Voice Data Collection .............................................. 155
Participant Selection ............................................................................................. 156
Data Collection Process & Timeline ........................................................................ 157
Translation of Photo-Voice Data .............................................................................. 160
  Workshop 1: On Participatory Action Research & Photo-Voice with Paul Omollo (3 hours) .... 162
  Workshop 2: How You Will Be the Researchers – "Speaking back" with your own data collection and evaluation loops with Paul Omollo (3 hours) ............................................. 163
  Intervention – Workshop Three: Better Photography with Colin H Richard ............. 164
Action research – Participatory action research – or Community Based Action Research .......... 165
Timeline .................................................................................................................... 168
  Day 1-10: ............................................................................................................. 168
  Day 11-15: Data check ........................................................................................... 168
  Day 16-25 Prompt Two .......................................................................................... 169
  Day 26-30: Final Data Check ................................................................................. 169
List of specific anticipated observable components of data .................................... 170
Chapter Four: Findings ........................................................................................... 173
Introduction .............................................................................................................. 173
Possible Frames for Narrative Analysis .................................................................... 175
Narrative Analysis – an introduction ........................................................................ 175
Structural Analysis .................................................................................................. 177
Interactional Analysis .............................................................................................. 178
Performatve Analysis ............................................................................................... 179
Thematic Analysis .................................................................................................... 180
The Data Themes that Emerged for Research Question One .................................. 181
In what ways does a non-formal ecopedagogy based curriculum cultivate critical consciousness among adult learners? ................................................................. 181
How do you see yourself as a creator in the way you farm and your role in that creation process? ................................................................. 181
A description of the findings using thematic analysis of the photo-voice data: ................................. 181
Creating the Coding Index for Thematic Analysis .................................................................................. 182
Theme One: Inter-being and its relationship to Networked Improvement Communities (NIC) .................. 186
Theme Two: Generating money via agricultural development .......................................................... 192
Theme Three: Systems approach to Gaia ............................................................................................. 194
Theme Four: Technical advantages and difficulties with regenerative agriculture .............................. 196
Theme Five – self-sufficiency: ........................................................................................................... 199
Theme Six: Agricultural resilience in times of Climate change .......................................................... 201
Theme Seven – need for capital investment – outlier theme: .............................................................. 202
Some expected findings of photo-voice data rooted in literature review: what did/n't show up for Research Question One? .......................................................... 204
The Data Themes that Emerged for Research Question Two ............................................................... 205
Research Question Two: In what ways is this ecopedagogy curriculum fostering collective change? 205
Prompt for RQ2: How is change made possible in your community? ................................................. 205
A description of the findings using thematic analysis of the photo-voice data: ................................. 205
Introduction: ................................................................................................................................. 205
Theme One: Knowledge transfer (NICs) ............................................................................................ 206
Theme Two: Learning by mimicry .................................................................................................... 207
Theme Three: Learning by doing - working together ................................................................. 210
Some expected findings of photo-voice data rooted in literature review: what did/n't show up for Research Question Two? .......................................................... 211
Conclusion ....................................................................................................................................... 212
Chapter Five: Analysis .................................................................................................................. 213
A Consideration of Some Epistemologies & Ontologies ................................................................. 213
Introduction: ................................................................................................................................. 216
Initial Goals of Dissertation ............................................................................................................ 216
Where FFS Ecopedagogy Curriculum is Succeeding Most in Western Kenya .............................. 218
Addressing Critical Literacy ............................................................................................................ 218
A few reflections on the structure of this discussion as it relates to critical theory .......................... 220
Biophilia, NICs, and Critical Theory: The power of imaginaries to create change ......................... 221
The ecopedagogy curriculum: The role of biophilia in cultivating wisdom and capacity for new imaginaries ............................................................................................................. 224
Cultivating new imaginaries: An attained success of the ecopedagogy curriculum ..................... 224
A Second Framing for Exploring Ecopedagogies Successful Curricular Impact: Permaculture technologies, alternative development, and fostering resilient systems .......................................................... 228
Agriculture & Development: War or peace? The permaculture curricular offering .............228
Cash crops, interbeing, and resiliency – impacts of ecopedagogical curriculum .................229
On a Love of Place(s) and the impacts of an ecopedagogy curriculum .................................................236
User-Centered Systems Design, Resilience, and Critical Literacy .................................................239
FFS in East African (Changing) Climates – Avoiding Solutionitis: Empowering Local Voices ..........241
The Changing Role of Women in Families Upon Exposure to Permaculture FFS ......................245
Improvement Science, NICs, and Collective Action: To what degree did Permaculture as an Ecopedagogical Curriculum have an impact? .................................................................247
Variability within the data ........................................................................................................252
Improvement Science in Action in the Permaculture FFS Community: Continuous Evaluation ....253
A wave of new teachers: Knowledge transfer as a function of NICs ........................................257
Conclusion on FFS Ecopedagogy Curriculum Success’ .................................................................262
Where FFS Ecopedagogy Curriculum is Most Failing .................................................................262
The ecopsychology around interbeing and biophilia is weak ..................................................262
Critical literacy around historical context is absent .............................................................263
Strengthen the co-creation of a theory of change/problem: ..................................................264
Suggested Improvements to an Ecopedagogy Curriculum for FFS in Kenya ..............................................267
Strengthen the Co-creation of the Theory of the Problem .........................................................268
Use the ToB to drive the Theory of Change ........................................................................269
Democratize the curriculum ....................................................................................................271
Add Adaptive Leadership Training .........................................................................................271
Strengthen Eco-psychology component of curriculum .............................................................273
Create Continuous Evaluation Feedback Loop ..........................................................................276
Utilize Continuous Evaluation & Improvement Science for Curricular Design .................277
Generalizability of the Study ....................................................................................................279
Future Research Directions – Where to? ..................................................................................280
Ecopedagogical Innovations ......................................................................................................281
Conclusion .....................................................................................................................................283
References .........................................................................................................................................286
Appendix ........................................................................................................................................286
i Survey ........................................................................................................................................301
ii Monitoring and Evaluation Tool Co-Created by Farmers ..................................................309
iii Schedule for Workshop #3 Intervention: ........................................................................313
iv Interview Questions for Paul Omollo: .................................................................................318
v Examples of PAR Monitoring and (Continuous) Evaluation Systems Setup by permEzone and C-MRA .................................................................................................................320
List of Figures

Figure 1: Systems Thinking and Improvement Science (Lucas and Nacer 2015, p. 8) ......................... 31
Figure 2: Embedded concepts of ecopedagogy ................................................................................. 33
Figure 3: Permaculture Values ........................................................................................................ 60
Figure 4: Sustainability in Conventional vs. Organic Farming ............................................................ 62
Figure 5: Framework for Initiating Network Improvement Communities ......................................... 110
Figure 6: Spectrum of Community Engagement ................................................................................ 165
Figure 7: Participation Continuum .................................................................................................... 166
Figure 8: Photo Emily Oslo .............................................................................................................. 186
Figure 9: Photo Jerry Wao .............................................................................................................. 187
Figure 10: Photo Lucas Raute ......................................................................................................... 189
Figure 11: Photo Emmanuel Wao .................................................................................................... 190
Figure 12: Photo John Leonard ....................................................................................................... 198
Figure 13: Photo Valentine ............................................................................................................... 203
Figure 14: Photo Hermann .............................................................................................................. 209
Figure 15: Photo Monica ................................................................................................................. 211
Figure 16: Photo Emily Oslo 2 ....................................................................................................... 226
Figure 17: Photo Phillip .................................................................................................................... 227
Figure 18: Photo Hermann 2 ......................................................................................................... 231
Figure 19: Swales .............................................................................................................................. 233
Figure 20: Photo Monica 2 ............................................................................................................. 235
Figure 21: Photo Eunice .................................................................................................................. 238
Figure 22: Photo Emily Oslo 3 ....................................................................................................... 239
List of Tables

Table 1: Applied Comparative Evaluations vs. Typical Applied Program Evaluation Research .......... 144
Table 2: Continuous Feedback Loop from Farmers - Implementation of Permaculture Techniques 256
List of Abbreviations:

ALE: Adult Learning and Education
CLT: Critical leadership theory
CQI: Continuous quality improvement
EE: Environmental education
FFS: Farmer field schools
FGM: Female genital mutilation
GCE: Global citizen education
IS: Improvement science
M&E: Monitoring and evaluation
NICs: Networked Improvement Communities
NFE: Non-formal education
PD: Positive deviance
RCT: Randomized Control Trials
SSA: Sub-Saharan Africa
List of Definitions:

**Biophilia:** A love of life – the idea that humans have a hard wired evolutionary predisposition to love life and cultivate a diversity of life.

**Critical Theory:** At its most simple distillation, this idea is based on the idea that humans are historically constituted beings, that we are capable of intervening in history and creating transformation, and that to do so is based on our ability to correctly name, reflect, and act upon phenomena. These three steps require theoretically infused actions – which is called praxis.

**Eco-literacy:** The ability to cognitively and emotionally interact and interpret our environment. To name, reflect, and interact with our world and especially our local world. There are a myriad of definitions for eco-literacy, many of which are explored in the second chapter of this dissertation.

**Ecopedagogy:** Is critical theory extended to the concepts of ecology. The ways in which the degradation of ecosystems and the violence towards Gaia and ecologies has a dynamic interplay with humanity, which is also an animal embedded in ecosystems (albeit a historically constituted animal) is explored within ecopedagogy. Development is not taken for granted within ecopedagogy, nor is the idea of progress. Rather, development for whom, by whom? And within this frame, which is not just an anthropocentric one, but is included other-than-human animals, and Gaia herself. What does it mean to have regenerative forms of development? What does a Gaia centered literacy and a history that explores the often silent manners in which the ways we exploit The Earth as a commodity interrelated to the ways we also exploit (typically specific sub) populations of humans to further that exploitation? What would a different utopian imaginary look like, and how can we start to move towards this?
Gaia: Named after the ancient Greek goddess of Earth – Gaia is the (increasingly scientifically intersectional idea with a spiritual inter-being component) that Earth is a living organism. That all components of Earth are inter-related, living and non-living, and give rise to a single living meta organism which is capable of maintaining feedback loops that create suitable conditions for life. This "Gaia hypothesis" originated among the scientific community in the 70s and was most famously articulated by Lovelock and Margulis (Margulis 1999; Lovelock 2000). Other articulations of this idea from a more spiritual angle have also been given (see Ingerman et al. 2016).

Praxis: As noted in the definition of critical theory, praxis is the ability to intervene and act upon a situation based on a theoretically informed understanding of it. To engage in praxis is to begin walking down the road of cultivating a critical consciousness.

Problem of practice: This is an idea within the framework of improvement science. A problem of practice is a shared problem that a community of practitioners or thinkers are trying to understand and tackle. It is not just a problem that is trying to be understood theoretically, but one that is trying to be addressed with practice, and have an interactive and dynamic exchange between both practitioners and those helping to theorize the problem.

Solutionitis: Another idea from improvement science, solutionitis is the propensity to jump to solutions before fully understanding the actual problem in its full nuance and complexity, often leading to interventions rooted in naïve understandings of the problem.
Prologue Part I: Reflexivity – How my biography informs this research project

In the opening to Plato’s *Phaedrus* we are asked a seemingly simple question, “Where have you come from, and to whither are you going?”

The answers to this can be astonishingly simple, humorous, deep, and soulful. They are of course the answers that comprise our biography and tell the story of who we are. Nietzsche is known for having once quipped that all philosophy is autobiographical (Prideaux 2019). This dissertation is based in many ways on my own answers to these two questions. This research is based in community based participatory action research, a framework that reveals a host of my own positions, values, philosophies that are staged within experiences, failures (sometimes forwards, and often backwards), and hopes that I have accumulated over my 41 years of life. Why would a person presenting with white skin (but who is a Sephardic Jew, hunted down by Whites, yet having to deal with always being assumed to be White, an interesting lived experience in the overtly systemically racist America), who grew up in the Orthodox Jewish community, who is a dual citizen of Israel, and who spent most of his first twenty years of life living in relative economic comfort in Upstate New York, decide to go and study regenerative agricultural systems and their intersection with educational policy and leadership in East Africa? And what possible meaningful connections or access points could I have to such spaces? Those are important questions. Am I just parachuting in to another community to use them for data to further my own career and research interests? To some extent that is true for any of us researching another community, even our own community, hopefully a participatory framework helps to offset some of these ethical risks. To what degree am I in danger of eroticizing the “other” and participating in a naïve belief or pastorally projecting some primitive idea of an indigenous “better way” of doing things
ecologically that isn’t grounded in an acknowledgment of the difficulties and realities of
clashes with modernity and economic inequity?

To grapple with my research and the literatures I weave together I think will be much
easier if some of my own biography is laid bare first, and I offer a bit of the pathway of the
journey that led me to these research spaces, and the specific sites, communities, and people
with whom I am now engaged in Kenya. How did I become interested in these spaces? These
topics? These communities? And how did they come to know me?

By knowing what this pathway has been as an emergent process, importantly, the
methodologies I have chosen as a framework will also make more sense (hopefully!) as will
the access points I have with which to operationalize them (as they require interpersonal
relationships).

I decided to begin a PhD because of a non-profit I was running for over ten years in
Uganda, which I started when I was still an undergraduate at the University of Chicago as a
teenager.

My dual citizenship has already led me to engaging in agricultural work there,
including permaculture work (a form of regenerative agriculture, I will go into details in this
in Chapter Two's literature review) in parts of Israel that have similar climates to Uganda.
This eventually led to some Ugandans reaching out to me via email when I was living in
Israel and then Chicago. It ultimately flourished into a penpal relationship, a visit, and
eventually into non-profit work we all did together to learn from one another about our
comparative ecosystems and ways we could better the ecosystems we lived in and help Gaia
to restore her natural beauty, diversity, and provide for the peoples living there.

But there were significant difficulties as we first began. We were having failures with
youth migration out as well as technology transfer due to literacy. Non formal education had
only had mixed results for us, and our peers in the area were having the same struggles. So we reached out to others who we knew were involved in that work in other parts of the world. We knew something was wrong/amiss, but didn’t know why. In the interim, I had finished my undergraduate degree and was now living in Israel and farming full time. I was also teaching secondary science, and as this work continued, was splitting my time, sometimes farming/teaching in Israel, and sometimes living in Chicago as a teacher, where I also did a degree at Northwestern in secondary science. We put together an incredible team of experts, both from East Africa and from the international permaculture community. Yet we were still frustrated with a lot of what we were witnessing. There were gendered dynamics that were sticky and entrenched (just as we witness nearly anywhere); food insecurity often remained an issue; there was risk aversion for obvious reasons with populations who had so much to lose if something went wrong, but where colonial systems of agriculture were just reproducing devastation, and critical literacy was struggling to succeed as a curricular innovation. As I discovered how common some of these problems were known to be, and became humbled by the amount of policy literature out there, I thought, "It’s time to go back for a PhD and figure out what is going on and what solutions are known that I can learn about and better understand this problem if I want to meaningfully engage in this work."

I knew that when I began this dissertation I wanted to help raise the voices of the farmers I worked with, and to figure out how we could better implement adult literacy and explore the impacts of regenerative agriculture. Not much more than that. There was too much that I didn't know that I didn’t know. That was kind of the entire point. And whereas my work at the time was rooted in Uganda, where it has been for fifteen years or so, this dissertation ultimately landed in Western Kenya, where numerous contacts emerged from those former projects. While I had hoped to do a comparative case study, this proved too difficult to finish with COVID complications and my desire to get this project completed.
However, the organizations we are working with continue to work in both countries and are expanding to Malawi in the near future, so the research arch remains and we will continue to explore the impacts in a comparative international education lens when this dissertation is completed. For the purpose of this dissertation, a case study of the work done in Kenya will be presented.

Though I did not know it when I began, the research ended up focusing on six threads that will comprise the cloth I weave in the literature review that will allow me to explore the questions I have in mind. These were all emergent. They required me years and years of thinking, reading, and dialogue with farmers, farm managers, curriculum designers, faculty, friends, partners, photographers, and many more hours of meetings, shared smiles and belly laughs, as well as some tears. This project is attempting to explore how we can provide food and water and a path to critical literacy and development for those who are often on the margins and ignored, without compromising the health of Gaia and our Mother Earth's ability to heal from the wounds that those in power often wrecked upon her in order to exploit the labor of our most at risk populations to create wealth and commodities for all the rest of us (Kempf and Palast 2008). The farmers who became participants in this study and the researchers whose data will illuminate this project shine a light for us all, and I am humbled by them.

Prologue Part II: The rationale driving the answers to those curiousities – what to expect

The findings that we have stumbled upon in this emergent process have profound and important implications for educational policy in the arena of ecopedagogy, farmer field schools (FFS), non-formal education (NFE), adult literacy, critical literacy, design of eco-
curriculum, and ways to better leverage adaptive leadership to build collective impact utilizing the power of rural communities.

This dissertation rests on two major critiques of current dominant forms of discourse within NFE for adult literacy, many of which are implemented through FFS:

1. That the purpose of such programs should be to provide enough literacy skills only to allow for technical transfer of programs (a new piece of machinery or equipment for example). In this manner this dissertation offers a specific and granular suggestion for how to improve upon NFE/FFS regarding curricular design. This is elaborated on in Chapter Five.

I will provide ample reasons for this critique in the remainder of this dissertation, but in this prologue I will simply state that technical transfers of technology using adult literacy treat people as automatons. They leave people to being preyed upon, and allow for corporations to commodify everything, including the soil, water, food, and air we breathe. They have not improved the lives of these farmers, and there is evidence that they have taken communities that were previously food secure, and made them insecure in less than a generation, while also diminishing their ability to be resilient to climate change, drought, and to have cash reserves for essentials – let alone their own development. This is within the spectrum of understanding, about as opposite within a binary as one can get to the purpose of creating resilient and regenerative systems that an ecopedagogy, as manifested in a permaculture curriculum, seeks to do. In the system I will be describing for a permaculture rooted curriculum situated in a critical literacy, there is required an ability to name, reflect, and then use a theoretically driven informed practice (called praxis). Contextual understanding, political and social realities, are paramount as part of the ways to consider relationships to land, food, and one another. This will be grealty expanded upon in the coming chapters.
These ideas were largely captured at the UN Conference on Trade and Development in 2013:

The 2008 food crisis was an important catalyst for realizing the need for a fundamental transformation and questioning some of the assumptions that had driven food, agricultural and trade policy in recent decades (However, actual results achieved since 2008 suggest that a paradigm shift has started, but is largely incomplete. Priority remains heavily focused on increasing industrial agricultural production, mostly under the slogan “growing more food at less cost to the environment” The perception that there is a supply-side productivity problem is however questionable. Hunger and malnutrition are mainly related to lack of purchasing power and/or inability of rural poor to be self-sufficient. Meeting the food security challenges in thus primarily about empower of the poor and their food sovereignty…The world needs a paradigm shift in agricultural development: from a “green revolution” to an “ecological intensification” approach.

2. This dissertation offers a theoretical and epistemological critique. It contributes to the theory of ecopedagogy as an educational policy.

The root of this epistemological critique is of course that literacy should never be for some tangible instrumental end – something that can be manipulated or commodified (what will be explored later in the literature within the framework of critical literacy as "banking education") but rather it should always offer a emancipatory approach. Education can have the capacity to offer freedom, but only when literacy is taught in such a way that it is deconstructing power. Such a transformative approach aims to “empower individuals and communities by adopting socio-cultural models associated with contextualized and multiple literacy practices, valuing of the ‘other’ and a strong critical element” (Maruatona 2008, p. 745) Would critical theory based FFS have better outcomes for the farmers and Earth overall?

Unapparent connection: Educational Policy & Leadership's relationship to regenerative systems and Gaia centered movements

A common question I get in the hallways of a U.S. department of education in a public university is: What does studying regenerative agriculture among rural communities in East Africa (specifically in this case study in Kenya) have to do with educational policy and
leadership? A fair question. The reason it doesn't seem as obvious as perhaps it should be is because of all the very layered ways in which these complex problems are intersectional. Agriculture serves as a primary form of development in much of the world still. And what drives this reproduction is, as is often the case, educational systems. Among farmers – being adults – this means two other systems: adult literacy and non-formal education. So how international development is driven is also linked to adult literacy paradigms and the construction of curriculum\(^1\) being taught to farmers in NFE, most commonly delivered via farmer field schools (FFS), at least in Sub-Saharan Africa. Given the climate crisis we face, given the mass extinction event we are already living within, if we want to consider how to fundamentally transform agriculture, which may well be one of the biggest challenges of our century, and one that could determine if literally a billion humans end up food insecure or climate refugees by 2050 (Flavell 2014, p. 38), it requires a shift in how we think of the connectedness and power relations between ourselves, our soils, other beings, and Gaia, herself.

This dissertation asks questions around such forms of consciousness – and how a curriculum may begin to impact it.

*The required transformation is much more profound than simply tweaking the existing industrial agricultural system.*

This dissertation does not have any expectations of answering all these questions, but I do hope that it can begin to point in a hopeful direction. As I will come back to in Chapter Five, critical literacy requires, among other things, the idea of hope. It is easy to deconstruct and point to the dark, but without hope, Freire and other critical pedagogues have always

---

1 Which can mean a myriad of aspects – from the actual building of a curriculum, it's content, the implementation, how different philosophies/pedagogies inform that curriculum and why those decisions are made (a system and it's curriculum/content are designed to create the outcomes sought for a reason – there's a logic to that construction and those aren't apolitical decisions).
argued, there is no critical literacy. Where does hope exist in the midst of climate disaster and
mass extinction? What is the role of international development and comparative education in
the midst of such darkness and how can it offer hope to those it seeks to work with, learn
from, and teach? If this dissertation can offer anything towards such epistemological
considerations it would be a gift, as this collective trauma humanity has created will
undoubtedly require a collective effort to see our way out of, or at least help to mitigate, the
worst of its impacts on both humans and Gaia.
Chapter One

Introduction

While more classical or perhaps normative approaches to educational policy and leadership tend to approach this subject from within the four walls of the classroom, as education exists within traditional approaches, there is also a long and rich tradition of non-formal education research (Evans 1981). Non-formal education (NFE) is the structured, pedagogically driven education that occurs outside of formal institutional spaces, and also includes the majority of what is often called “adult education” within economically developing nations for the purposes of adult literacy and mass literacy campaigns and adult basic education (Abendroth 2009; Elvy 2007). This dissertation focuses on one such NFE program, with an emergent twist, that of critical eco-literacy focused NFE via an ecopedagogically framed curriculum. Eco-literacy\(^2\) is an awareness of the dynamic human relationships to our ecosystems (Margulis 1999; Kahn 2010; M. K. Stone and Barlow 2005). Ecopedagogy, in addition to eco-literacy, can be understood to comprise several additional components:

- biophilia - the love of life (Fromm 1973; Wilson 1984; Arvay 2018)\(^3\),
- conscientization within ecopedagogy (Antunes and Gadotti 2005; G. W. Misiaszek 2010; 2015),

\(^2\)While I will be using the term here ecoliteracy, which has been what is more traditionally and commonly used in much of the literature discussing these topics, one can also find the term ecopedagogical literacy that will importantly include many components of ecoliteracy that relates explicitly to human relationships to ecologies, especially how economies are embedded within ecologies.

\(^3\)This idea has been contrasted with the idea of civilization, itself as a structure, being one that is built upon necrophilia, a death loving culture. This idea has been elaborated on by Fromm (1963) who also made explicit the contrasting idea of love to that of a death loving culture. Fromm concludes his work “The Art of Loving” by writing, “Society must be organized in such a way that man's social, loving nature is not separated from his social existence, but becomes one with it. If it is true, as I have tried to show, that love is the only sane and satisfactory answer to the problem of human existence, then any society which excludes, relatively, the development of love, must in the long run perish of its own contradiction with the basic necessities of human nature.” To which he contrasts this in his final sentences by pointing out that “this need has been obscured…does not mean it does not exist. To analyze the nature of love is to discover its general absence today and to criticize the social conditions which are responsible for this absence” (Fromm 1956, p. 133).
• a way of thinking about the world and oneself as interconnected, what Thich Nhat Hanh calls “interbeing” (1987),
• the ways in which ecopedagogy interacts with issues of social justice (Freire, 2004)
• and how it functions as a critique of civilization itself (Kahn, 2010) - to ask questions in development of who is benefiting, who is not, and why (G. W. Misiaszek 2020).

NFE had its most successful stories in the Global South among communist and socialist societies. Abendroth gives a particularly excellent account of this from a Cuban perspective in Rebel Literacies (Abendroth 2009). Friere participated in helping foment some of these changes as well, and there are other accounts of successful NFE and adult literacy campaigns in the Global South that took place outside of capitalist societies ( Boughton and Durnan 2014; Boshier and Huang 2010; Freire 1970b; Hanemann 2016). That being said, in the second half of the 20th century, many NFE adult literacy campaigns, including those occurring in more socialist societies, were driven by the specific aim of “technology transfer” (Chambers 1997; Defoer 2002; Najjar, Spaling, and Sinclair 2013). Meaning a primary purpose of such literacy campaigns was to ensure a minimal threshold of literacy by adults so they could implement the demands of big-agricultural industry for growing and usage of technologies that were perceived to aid in the development of GDP vis-à-vis cash crops (for example). The calls by the global education community as articulated in the Education for All went beyond this, describing the need for literacy within a “contextually bound continuum of reading, writing and numeracy” (UNESCO 2006, p. 30). Even earlier, at the onset of Education for All it was recognized that "whether or not expanded educational opportunities will translate into meaningful development...depends ultimately on whether people actually learn as a result of these

---

4A fictional accounting of this viewpoint that is based on research but written in narrative form can be found in the best-selling trilogy Ishmael by Daniel Quinn (1992)
opportunities." (World Declaration on Education for All Article 4). The capacity to implement this was also understood as an ability to leverage local wisdoms, "the development of endogenous capacities to meet the basic learning needs of all requires significant improvement" (UNESCO et al. 1999, p. 1) However, as Lonsdale and McCurry noted even back in 2004, what has actually tended to be implemented are educational models that are “economically driven, associated with workforce training, productivity, functional literacy and notions of human capital” (Lonsdale and McCurry 2004, p. 14).

The manners in which the aim to achieve universal literacy, versus a technical literacy, and these contested definitions and goals, will be explored more in the subsequent sections. Why ecopedagogy looms so large in this contested terrain will also be explored, given we are living in times where what those forms of literacy have become critically important to disrupting dominant systems, if we want to have educational policies that can disrupt current systems reproducing the forms of violence we are witnessing, such as mass extinction.

Two Critiques to Literacy for “Technology Transfer” (Aka The Human Capital Argument)

This dissertation explores a critique of this approach based on two substantive claims. The first is a more technical critique of this approach, without challenging its more fundamental epistemology. For while this functional/technical NFE adult-literacy approach was met with

---

5 If we look back to CONFENITA II which met in 1960 in Montreal Canada – we can see even then that global leaders discussing adult literacy were trying to thread a needle for how to negotiate the need to "disappearance of traditional cultures" while acknowledging the rapidly increasing power of "technological developments." They also spend a lot of attention on the increasing role of women, and the agitation of youth to be given a more hopeful future, and the role of vocational education, and adult literacy that can offer development pathways that harness the power of technology, nationalism, and capital. With all of this in mind, it also very presciently notes that, "in today's world, international understanding, mutual sympathy and tolerance of different points of view are more important than ever before. Adult education is needed to promote this understanding, to combat propaganda whereby it is impaired and to put every adult in the way of arriving at the truth. The immense power of the mass media of communication is not always used with this end in view" (UNESCO 1960).
reasonable successes in Southeast and Southern Asia (Fliert and Braun 2002; Palis 2006; Hazell 2009) where latitudes and geographies made it such that monocultures and ecosystems were often reasonably consistent for such adoption of technologies across vast regions, this approach failed rather miserably when applied in Sub-Sahara Africa, where ecosystems often change over very short distances (Berg and Jiggins 2007; Chambers 1997; Deugd, Röling, and Smaling 1998; Rachel Percy 1999; R. Percy 1999; Pretty 2002; Tittonell et al. 2005). What is apparent already is that even if one wanted to adopt this epistemological mindset: education’s proper ethic, aim, and alignment rests with the purpose of teaching adults to read and write for more focused goals of integration into labor markets to improve economic development, it becomes a difficult epistemology to hold on to because this approach to adult literacy for technical knowledge transfer has been met with poor reviews (Flavell 2014; Conrad 2014; 2010; Millner 2017; Deggau et al. 2020) for market efficiency in the context of SSA and bears reconsideration on this merit alone (even if we don’t consider the ethical/moral aspects of emancipatory literacy). Economic development increasingly requires recognition that economies are embedded within ecosystems, and that agriculturally rooted development also requires a focus on people’s consciousness and relationship to land, other being, and Gaia.

A second, and more epistemological critique of this knowledge management and technical knowledge transfer approach to NFE and adult literacy will also be explored within this dissertation, namely, the idea that adult learning and education should be striving for more

---

6 In Southeast Asia the latitudes and climates there which were more homogenous (not homogenous – but more so) allowed this technique to have more success in that it did reduce pests – and it did increase crop yield. Even so, there are biting critiques of the impacts of this technique that scholar activists like Vandana Shiva charge against such practices (Shiva 2015; 2004). Not always because of the technologies themselves, but usually more because of how they capitalize their technology and put farmers into debt they can’t recover from, and at times also a compounding effect of the pesticide/poison they are putting on the land (Gutierrez et al. 2015). Other aspects of these technologies use bio-pesticides and low spray technologies – and these have demonstrated an ability to increase yields – but this has not worked well in ecosystems with more rapidly changing ecosystems and that are more on the forefront of dealing with climate change – typically in the form of droughts.
liberatory and transformational goals within the human being and the communities in which their lives gain and make meaning. Such a transformative approach aims to “empower individuals and communities by adopting socio-cultural models associated with contextualized and multiple literacy practices, valuing of the ‘other’ and a strong critical element” (Maruatona 2008, p. 745). For critical theorists, the word critical has an important meaning, beyond simply meaning “critical of” in a theorizing manner. Rather, “this (the word critical) is powerful and important only if the critical thinking leads to action” (Abendroth 2009, p. 6), what is called praxis in critical theory. Praxis means actions that are informed by deep understanding of how theory and history intersect in nested problems, creating a literate citizen, someone who is able to correctly name phenomena and therefore act upon them to facilitate change (Freire and Shor 1987).

The Wicked Problem & Adaptive Leadership

Both of the above critiques – one regarding a technical transfer of literacy and the other of an epistemological stance using critical theory - are addressed within the framework of a Wicked Problem. Wicked Problems (a jargon in this field which I will sometimes simply call complex problems for ease of reading) constitute a conceptual framework that conveys problems that are highly nested and have no clear linear solutions; they require adaptive thinking and leadership. Adaptive leadership (these ideas are explored in much greater detail in Chapter Two Section Six) is meant to help leaders consider how to move away from command and control thinking that attempts to approach problems and problem-solving in a linear manner (taming of a wicked problem), with six guiding principles (Heifetz and Laurie 1997, p. 172):

1. "Getting on the balcony
2. Identifying the adaptive challenge [often a wicked problem]
3. Regulating distress
4. Maintaining disciplined attention
5. Giving the work back to the people [participatory approaches and methodologies!]
6. Protecting the voices from below [again, participatory approaches]’’

The ideas behind adaptive leadership will be expounded upon more broadly in Chapter Two on Networked Improvement Communities and Improvement Science. It is this framework and specific methodology that incorporates and weaves together many of the other threads of Chapters One and Two, as we shall see. For now, it suffices to appreciate that adaptive leadership is a paradigm shift in which leadership is understood to be more akin to tapping into collective intelligence or community wisdom by means of participatory approaches that recognize that knowledge and wisdom are embedded within the workforce/community/people and that power dynamics need to be democratized in order to solve the most complicated problems facing humanity – be they local or global. Climate change and the intersections it has with literacy, NFE, and biodiversity loss in East Africa certainly represents one such wicked problem. In fact, it represents a perfect storm where adaptive leadership can be put to good use.

The wicked problem is contrasted to the tame problem. A Tame problem:

1. “Has a well-defined and stable problem statement
2. Has a definite stopping point, i.e. when the solution is reached
3. Has a solution which can be objectively evaluated as right or wrong
4. Belongs to a class of similar problems which are all solved in the same similar way
5. Has solutions which can be easily tried and abandoned
6. Comes with a limited set of alternative solutions” (Conklin 2005, p. 11)

Part of the first critique, the failure of past technocratic, linear, and human-capital approaches to education in SSA, rests in the idea that it is attempting to solve a wicked problem by taming it, which doesn’t work (Conklin 2005a). Consequently, more linear approaches for how to solve (tame) some of these wicked problems. An example would be gendered outcomes related to power in land ownership and food production, agricultural production, biodiversity,
water usage and storage, and the design of rural communities economies, which has led to a reconsideration by some policy makers and international organizations about approaches (Athanasiou 1998; Bauman 2003; Shiva 2004; Global Education Monitoring Report 2016; Todo and Takahashi 2013; Jones 1990; Davis et al. 2012; D. Epstein-HaLevi et al. 2018; Tittonell et al. 2005; Conrad 2014; 2010). Alternative models based on biomimicry of ecosystems, and a system design approach that is comfortable with preserving complexity (which means you lack total control over the system, inevitable in a system governed by countless bacteria in soil and 100,000 different chemicals humans have put into the air) (Orr 2004), has been promoted as one such non-capitalist development alternative. Using low inputs and a system design approach, this agricultural design system is commonly known as permaculture or agro-ecology within academic circles and represents a developmental alternative for humanity, especially in the SSA context (Mollison 1997; Conrad 2013).

Trust, Relationships, Power: The Participatory Approach is at the Heart of Improvement Science

Within the second, epistemological critique, the wicked problems framework also offers a way to begin understanding how to solve such problems from an educational policy and leadership perspective. For embedded within the wicked problem framework is the notion that such problems exist in part due to their social complexity (Pascale, Sternin, and Sternin 2010; Conklin 2005a), and require participatory approaches (Carlos Alberto Torres 2017b), with adaptive leadership (Heifetz and Laurie 1997), and radical approaches to inclusivity in how stakeholders are engaged in the process of having voice, sharing perspectives and ideas, and co-creating solutions. “Achieving shared meaning and shared context is especially difficult” (Conklin 2005b, p. 17) in such socially complex wicked problem settings, but also critical for a process that attempts to address them if it is to succeed. Simple measures designed by outside experts and then instituted with fidelity in a command and control style hierarchical
arrangement of power and imposition of a truth do not work as solutions or leadership styles for addressing wicked problems. The reasons for this abound, and will be examined in detail in Chapter Two Section Six.

In this introduction, suffice it to say that it largely boils down to the notion that the people, who live and breathe the daily reality of the ecosystem in which they live, have a profoundly deeper understanding of that ecosystem than do any outside experts. This does not mean that experts do not have privileged knowledge or use and value as facilitators, particularly as inter-professional facilitators of disciplined knowledge that tends to have incredibly difficult time being translated across boundaries (Lawson 2014). However, it does mean that for measures (especially those related to interventions) to have meaning they need to be locally designed by the community itself, through a genuine and authentic process of power-sharing in which the people being studied have meaningful decision making power and voice about what to study and how to study it (Lawson et al. 2015; Pascale, Sternin, and Sternin 2010). The technologies and methods of improvement science encompass such a worldview. They express an epistemology and a set of values: that communities are units of analysis, that they have a right to voice, and that when their own power is ethically utilized in collaboration with university partnerships (using both academics and practitioner/experts who can help bridge the knowing-doing gaps) (Berwick 2003; A. S. Bryk and Gomez 2007) more meaningful measures and research can be accomplished. That is to say, because there is greater buy-in from a co-created design, there will be greater fidelity of implementation. The co-creation also creates a trust in the description of the problem and solution themselves, making implementation of the intervention itself more likely, as well. The reason for this belief rests in the idea that scale and reproduction of successful discovery of knowledge doesn’t merely rest in the knowledge sharing, or knowledge management. Rather it rests in the discovery of that knowledge itself. When people are part of the discovery of an idea, and participate in how a question is framed
and in the pursuit of an answer, they automatically have possession of that idea in a fundamentally different manner. Trust lies at the heart of such a relational view of research, which is at the very core of both the problem solving technologies (improvement science often refers to six specific principles) the methodologies (such as those used by positive deviance which espouses a participatory approach (Singhal, Buscell, and Lindberg 2014), and epistemologies (for example, that knowledge co-created is more rigorous, reliable, and valuable Lawson et al. 2015).

This second epistemological critique points to the need for more adaptive leadership, more transformative/liberatory praxis (action based on informed theory and understandings of a phenomena) and holistic approaches to what NFE and adult literacy (hereafter referred to in unison as Adult Learning and Education, ALE) should be aspiring to. It is within this framework that the design-system (adopting a wicked problem approach) for agricultural design called permaculture or agro-ecology comes into play. My argument is that permaculture is a (there are surely other roads to this) curricular manifestation of such a curriculum, based on ecopedagogy and a critical theory approach. If upon making that argument one accepts that assumption, it would follow that this curriculum then offers a possible window into how successful such an alternative ALE project may be, that is approaching these problems with at least some elements of both of these critiques in mind as it shapes its programming and curriculum. If I want to start imagining what an alternative curriculum could look like, one that challenges capitalist theories of development, or theories of human capital that have been failing large segments of society, or consider what a critically informed liberatory approach to literacy may look like, this could at least give me some ideas to consider. What are the implications beyond my self-reflexiity? It will unquestionably have its defects and drawbacks, but it may also have some intriguing insights into imagined alternatives upon which to build.
I had initially aimed for a comparative case study of two villages in Uganda and Kenya, where I have done work given the large number of farmer field schools (over 3000) and the increasingly common usage of permaculture amongst some of these trainers. However due to COVID, this ended up not proving possible and I have simplified this dissertation to focus on a case study involving the work with farmers in Western Kenya (see maps in Chapter Three), using a form of program evaluation that maps neatly onto the logic of improvement science and ecopedagogy. I believe the case study offers the best choice for a methodological strategy as it fits the needs of the research questions raised that arise out of the literature gaps raised in Chapter Two.

Given that the research questions are not raised until Chapter Two, I will wait to address the first point as it becomes more relevant and unpacked in Chapter Two during the literature review, and in Chapter Three in methods. However, I would like to touch briefly on the second point, the manner in which the methodological choice of the case study and an evaluation of this farm site maps on to the discussion in this introductory chapter about improvement science, logic models, and wicked problems. At its simplest, continuous evaluation operates by trying to determine what is working, and seeks to evaluate programming in order to create opportunities for improvement. In this respect alone, it has much in common with improvement science: learning how to get better at getting better. This is made explicit by many of the scholars in these fields (Vogt et al. 2012), an idea I will return to in my analysis in Chapter Five. But beyond this, in order to try and determine the degrees to which improvement is/isn’t occurring, many of those who work in continuous evaluation programming operate in a “theory heavy” framework by referencing logic models – that is theories of action and theories of change – which again lie at the very heart of improvement science. Program evaluation is not inherently an improvement science framework, but the two share a great deal of how they perceive the logic of systems, and I will discuss in subsequent chapters how I see these two
threads being capable of weaving a more beautiful fabric when used together. So I have decided on a methodological framework for the case study using a specific kind of program evaluation, that will allow me to interrogate many of the concepts that I have raised in this introductory chapter, and others which I intend to braid into this conversation around ecopedagogy and curriculum (among others) in Chapter Two in the literature review.

Improvement Science as an Interrogative Lens

---

7 I realize this phrase “methodological framework” may be a bit confusing – perhaps a bit inevitable given the fabric being woven by these different threads. Is it a method or a framework? A technology or a method? A process by which to attack a problem and find a solution, or a method for how to gather data with defined research tools? As I noted earlier – improvement science as I am presenting is composed of both technologies such as seven principles our team at The System Center at University at Albany identified building and modifying on the work of Carnegie Foundation's more classical six principles. Those principles are 1. Be problem focused. 2. Contextualize 3. Elevate community authority & wisdom 4. Measure 5. Fail Forward 6. Change Mindsets 7. Facilitate Systeness. So improvement science is composed in part of a problem solving technology - a framework for how to solve problems. Additionally, it is comprised of specific methods for how both research should be conducted to reveal the solutions to those problems via community rooted attitudes to understanding the problems and solutions. This is particularly true within certain schools of thought within improvement science scholarship (not all would agree with this – and I will tackle this in more detail in Section Six of Chapter Two). Those who take a positive deviance position, as well as many who take collective action positions which are often rooted within Networked Improvement Communities, commonly rely on methods that are participatory in nature, elevate community voice, and have specific epistemologies associated with them. For example it often values epistemologies rooted in decolonizing voice (data), and the value of data that captures depth of voice from participants in order to better understand narrative and how this informs realities/phenomena that collective action (improvement science is about getting better at getting better – collective action is extending applying that same idea to a group for a specified goal) . The process of discovery of ideas, as much as the "right" ideas themselves is seen as crucial for successful implementation, knowledge sharing, and fidelity of implementation of meaningful theories of change/action. In chapter three under the comparative case study, I explain in some detail how program evaluation, and particularly aspects of continuous evaluation can work in harmony with improvement science – which we implemented ourselves in this project. Utilizing participatory forms of program evaluation, we were able to engage in an improvement science process (learning how to get better at getting better) while also making use of technologies of program evaluation – but only by doing so within a participatory continuous evaluation model. I will explore ways in which such participatory forms of continuous evaluation were used for programmatic evaluation in Chapter Five in a section titled "Improvement Science in Action in the Permaculture FFS Community: Continuous Evaluation.” Due to this combination of technologies, process, and methods, I refer to this as a methodological framework.
The IS literatures offer a way to evaluate claims being made by alternative adult-literacy programs (ALE). Improvement science is a problem solving approach that attempts to address wicked problems, and provide methodologies for how to achieve collective impact and design pedagogies for learning from failure to maximize the ability of people and programs to be adaptive and learn how to get better at getting better (Bryk and Gomez 2007). Furthermore, the specific technologies and common methods employed by IS that I will be using, Networked Improvement Communities (NICs) and Positive Deviants (PD), embrace a particular attitude towards participatory design and stakeholder involvement, justified epistemologically for some of the reasons briefly touched on above (see also Chapter Two-Section Six). This provides an evaluative framework with which to operationally consider the claims of such eco-literacy ALE based adult education programs in East Africa. Based on this framework I am then able to develop both the research questions that emerge from methodological as well as literature gaps (Chapter Two) and to then explore what methods can be used to actually conduct the research and evaluation (Chapter Three).

The above is meant to give just a brief overview of how these literatures interact and why this dissertation requires a weaving of several threads of different literatures.

- the theoretical work of ecopedagogy and critical theory/literacy,
- an applied curricular example of ecopedagogy within agro-ecology (aka permaculture),
- non-formal education extension learning services as implemented in farmer field schools (FFS),
- gendered dynamics in agriculture, literacy, and development.
- continuous quality improvement and network improvement communities – including elements of wicked problems and theories of action

I will approach these literatures, briefly, mostly in that order. The goal is that my presentation of these varied literatures will weave a narrative that demonstrates:

1. why and how these literatures interact and
2. why our standard and normative approaches to agricultural practice and development have ill served many of the populations of the world.

Though my dissertation will focus on how this has impacted agricultural communities of East Africa, in particular more marginalized farmers in low income communities in Kenya. Ultimately I seek to explore if network improvement communities as being applied in this educational case can better serve to alleviate suffering by unleashing the power of citizen-scientists and farmers to better understand their own histories and ecosystems, and be fuller partners in the choices and usage of their resources. Such suffering could include, for example, the ability to harvest rain water and therefore negate the need for young girls to walk dozens of kilometers a day to fetch water and miss school. It could include the ability to rejuvenate soils, increasing soil fertility and nutrient loads and thus the quality of the food being consumed and the health of the bodies of the people working that land. It could include aspects of raised consciousness and critical literacy that impact gendered dynamics around power, voice, land ownership and access to resources, creating happier citizens or more equitable labor practices, to name but a few of the wide-ranging sorts of indicators that NICs (via collective action and knowledge sharing) could potentially impact. This evaluation is rooted in a theory-of-change framework, exploring the claims of the theories of action made by the program (Chen 1994).

A theory of change/action is more deeply explored in the next chapter, but essentially it is a logical sequence of anticipated cause/effect events.

---
8 The reasons behind this will be unpacked at length in Chapter Two Section Four which focuses on the intersection of gender and agriculture in particular. Some of the reasons, in brief, that women tend to suffer more from degraded ecosystems are that women comprise some 80% of the labor involved in fetching water when no clean/safe water is available, and comprise the bulk of the labor (typically unpaid) for providing wood for energy, and cultivation of fields for food. The example of the fetching of water speaks to hidden causes that young women and girls are often missing more school than their male counterparts. Degraded food systems as a function of degraded ecosystems even make it more likely that women intake fewer calories than their spouses or male counterparts, as women serve as “shock absorbers” for shortfalls in food production. Many more examples and troubling gender based gaps related to this are addressed in Section Four (Global Education Monitoring Report 2016; UN Women 2018)
When projects lack a theory of change that addresses why they are expected to work or what effects could be reasonably achieved, they tend to be fragmentary approaches that are not linked to change initiatives...In addition they frequently lack a comprehensive or systemic approach to accomplish some change in practice” (Vogt et al. 2012, p. 316).

Thus, in order to be able to conduct an ideal evaluation using this model, I will also be able to unearth a decent theory of change and action by the organizations participating in the pilot studies. A failure to do this is common in development and professional development, and makes evaluation particularly difficult as evaluation is then limited to the process and can’t consider outcomes (Desimone 2009; Elmore 2004; Guskey 2000).

The GEM Report Gender Review of 2016 notes that current trends are dooming tens and even hundreds of millions of people to continued poverty and oppression, and that to “buck this trend” we have an “urgent need for new approaches” for “holistic responses” that “reach out beyond traditional boundaries” of interactions (Global Education Monitoring Report 2016, p. 4). The need for evaluations, and radical policy shifts based on what we are witnessing from the current process/outcomes, is stark. In addition to continued poverty, among the other predicted consequences of not adapting innovative policies are: gender inequalities, unsustainable consumption/production patterns, hunger/starvation, and devastation of ecosystems (Ibid.).

This dissertation explores and analyzes the findings of a promising innovative practice impacting leadership and sustainable design systems for regenerative agriculture (and beyond), that of agro-ecology. More Freirean/critical literacy approaches in farmer field schools of East Africa have adopted agro-ecology (aka permaculture) as their core curriculum. There is mounting evidence that critical literacy approaches are essential for more improved gender outcomes in educational programming (Jewkes et al. 2014). Agro-ecology is (based on my extensive research) the only widely available non-formal education programming that adopts
a critical approach to agricultural literacy (See for example: Kahn 2010; Conrad 2014). In particular, I will focus on such developments in Kenya. Permaculture and Freirean literacy approaches exemplify a networking improvement community, and the usage of continuous quality improvement (CQI) and improvement science (IS) (ideas further elaborated in Chapter Two Section Six). My interest lies in interrogating to what degree permaculture FFS in East Africa are utilizing CQI and IS because we know of the importance of critical literacy approaches and continuous evaluation models for more meaningful and successful interventions at this point. This would include, for example, learning from failure, fostering vulnerability as a culture, using rapid prototyping to experiment with new ideas (particularly appealing to citizen-scientist farmers on the margins of food security) (A. S. Bryk et al. 2015). These are ideas that I will more fully interrogate in Chapter Two Section Six, as well as in my methods in Chapter Three. As failure is a critical component of CQI and NIC, a genuine embrace of this framework should mean (unlike in many development projects) I should see a willingness and even an embrace to share, discuss, and explore failures, instead of an attempt to hide them (A. S. Bryk et al. 2013; A. S. Bryk and Gomez 2007). This is an example of the ways that a logic model for a theory of action/change can be used in continuous program evaluation as applied to some of the specific (in this case culture) components of a NIC for improvement science (Weiss 2000). These are ideas I will elaborate on in Chapter Three. Among the myriad wicked problems and literature I will explore in Chapter Two are:

- The impacts of ecopedagogy as a curricular manifestation (Section Two)
- What impacts ecopedagogy curriculum are having on FFS (Section Three) and regenerative/sustainable\(^9\) ecosystems and policy

\(^9\) While the typical language seen for “green” issues tends to be “sustainability” – agro-ecology seeks to go beyond this to “regenerative”. I will often use the word sustainable as this is the more common place jargon in the literature, but the real focus is on regenerative systems that 1. Diminish labor required to maintain yields over time due to their embeddedness within ecosystems that self-perpetuate and 2. Can heal the wounds to ecosystems from previous human behaviors. Sustainability is seen as a less worthy goal by permaculturists
• How critical literacy approaches are impacting women’s leadership and gendered dynamics in agricultural and FFS (Section Four & Five)

• To what degree is permaculture as expressed in these two FFS pilot programs an example of NICs and IS? (Section Six)

Reason for Selecting Western Kenya

My choice of doing research in Kenya is twofold. One, as will be documented at length in Section Three, East Africa has been one of the most successful places in the world, and certainly within Africa, for the proliferation of FFS (Duveskog, Friis-Hansen, and Taylor 2011; Najjar, Spaling, and Sinclair 2013; Conrad 2014; Davis et al. 2012; Larsen and Lilleør 2014). Kenya is also unique in having adopted many of the frameworks of improvement science for how they are monitoring and evaluating their work (Najjar, Spaling, and Sinclair 2013).

Additionally, I have access to these communities and data due to my own background of having worked and lived at times in this part of the world. As I will discuss in Chapter Three where I focus on the methods and approach for collecting data, building a trusting relationship with potential interviewees and participants in qualitative research, particularly given my own identity as an outsider, is essential for such research. It is also critical to my ability to function as a facilitator in this participatory action research (Lawson et al. 2015). I previously ran a non-profit that did work with Ugandan and Kenyan farmers and educators that focused on creating sustainable villages and creating collaborations between various ethnic and religious groups in Eastern Uganda and Western Kenya. That work led to my current contact, Sheena Shah, who worked at one of the largest permaculture research
given it means the continued sustainability of current consumption/production patterns that are destructive by nature to most ecosystem and life on the planet (Hemenway 2010)
institutes in Kenya, and introduced me to the teams I have been working with (detailed more in Chapter Three), permEzone\(^{10}\) and Community Mobilization for Regenerative Agriculture (C-MRA)\(^{11}\). The years of work in which I built up these relationships made it possible for me to access some of the populations of farmers in East Africa (we had initially been exploring comparative case studies in Uganda, Malawi, and Kenya, but for many reasons- including the pandemic- this has been now limited to a single case study) being exposed to this curriculum and critical literacy, making this study feasible. This is also due to the trust and relationships I have built with Hugh Kelly who runs Permezone.org, a non-profit dedicated to a “mission to inspire, empower and support farming communities in the developing world to build regenerative food systems that will meet the needs of current and future generations, creating self-sufficiency, eco-social resilience, and thriving rural economies” (www.permezone.org Retrieved October 30, 2018). In the summer of 2018, Hugh approached me, based on work we had published together on permaculture and eco-resilience (in collaboration with Sheena Shah of PRI-Kenya among others – see Epstein-HaLevi et al. 2018), to join permEzone’s monitoring and evaluation (MEL) team. This work continues to implement and test out permEzone’s vision of building an Ecosystem; a network that connects communities in building and preserving unique local intelligence derived from real-life experience on the land. In combination with appropriate training and information resources, the power of shared experience can empower the development of sustainable productivity designed to work in harmony with nature. (www.permezone.org Retrieved October 30, 2018)

Thus, in this research I have worn a few different hats, one as a member of permEzone’s MEL team to help observe, document, and analyze what is actually occurring in their pilot programs in Kenya and Uganda, and the other as a doctoral candidate conducting research with overlapping aims specific to the Kenyan site. Given that my research is

\(^{10}\) www.permezone.org

\(^{11}\) https://www.facebook.com/rongoCMRA/
participatory action research, I have been facilitating the training at times of the trainers for how to engage in participatory practices, and have done my best to stay transparent about what role and position I am writing from.

In Uganda I have spent much of my own labor and invested my heart (for 20 years now), and that has come across enough to participants that despite my outsider status with white skin and differing cultural background, I have often been given access to experiences and conversations that are normally reserved for community members. This includes invitations to be part of intimate family ceremonies by previous farming families I had worked with. A similar space has been emerging with my work and relationships in Kenya (over the past 8 years). This gives me confidence that I have developed an insider/outsider perspective in this research and have access to reliable data. To quote Chancellor Emeritus of SUNY Dr. Nancy Zimpher, networked improvement communities “move at the speed of trust” (personal communication 2018), and thus my success, or lack thereof, in building such trust with the farmers and other community members I have been working with and researching with, is critical to the success and veracity of this research. COVID interrupted the manners in which this would impact the nature of the interactions (though not the need for trust and vulnerability for reliable data). I will discuss this in more detail in the chapter on methods.

This dissertation is rooted in the work of permEzone and C-MRA: The farmers of Asumbi

This dissertation studies a curriculum that was part of a larger project conducted by permEzone and C-MRA, which was conducted over a two-year period. The permaculture design course (PDC) which is being implemented through this farmer field school is the basis for my doctoral case study. This permaculture infused curriculum is what I will argue is an
example of an ecopedagogy. It thus offers an opportunity to interrogate ecopedagogy beyond a theoretical lens. The PDC lasted for three months. Initially there were to be 20 lead farmers as part of this FFS exposed to this PDC in Western Kenya, 10 from 2 different sites, one in Migori County and one in Homabay county. The one in Migori County collapsed due to poor local leadership, which left the site in Homabay County. The site at Migori was strategically abandoned very early in the program, before the curriculum had been taught, when it became clear that the leaders who had been entrusted to help coordinate the project were not going to be able to deliver on a participatory action research (PAR) model.

Those 10 lead farmers were selected based on the idea that they would fit criteria which would maximize their leverage to impact the system. The indicators for this included items such as:

- Active in cultivating their land
- Owned at least 1/4 acre of land
- Ability to lead and influence others
- Self-confident
- Capacity to teach in trainer to trainer models

Thus, from the beginning was built in an idea of peer-to-peer adult education and knowledge sharing, rooted in how they selected the original 10 farmers. Those 10 lead farmers were then invited to a Participatory Action Monitoring (PAR) monitoring and evaluation workshop which helped them learn how to engage in the continuous evaluation models and how to co-design indicators for the project. Thereafter, the actual curriculum was implemented and taught. This curriculum was a 17-day full day curriculum which was spread out over 3 months. The idea was that this would also maximize the ability of farmers to experiment with ideas, setup their own model farms, and begin having the ability to influence others, and to experiment with their own leadership styles and explore peer-to-peer learning and training opportunities, and discover what needs they had to lean in to such experiences and opportunities. An extension program continued for 18 months in which Paul and other
personnel from C-MRA offered support to those 10 lead farmers to help them become more comfortable working as teachers with their neighbors and to offer any continued joint learning they felt they may want as they began to implement these new agricultural models.

This doctoral study is the result of my own contribution to this program run by permEzone and C-MRA. In the coming chapters I explore relevant literature and describe the methodology and tools that were used to explore more narrative components of the data set, which elaborate what did/didn't work about this curriculum, particularly as it relates to improvement science, PAR, continuous evaluation, and what all of this can tell us about a curriculum rooted in ecopedagogy and the raising of ecological consciousness and leadership among farmers in Western Kenya during the pandemic.
Chapter Two: Literature Review

Preface

Fundamentally, the task is to articulate not just an alternative set of policy proposals but an alternative worldview to rival the one at the heart of the ecological crisis – embedded in interdependence rather than hyper-individualism, reciprocity rather than dominance, and cooperation rather than hierarchy. – Naomi Klein

When I initially wrote this literature review, a process that has literally been over a timeline of years, my initial research interests have shifted, and what and how I was going to research these literatures and questions was of course more theoretical. I wasn't entirely sure what site I would land on, whom I would work with, what methodologies would be available to me, or what the scope and feasibility of the work would be. Nor had COVID arrived at our doorsteps yet, which created upheaval for my ability to conduct the original research I did have planned.

Consequently, many of the research questions below became impossible to explore for this dissertation. The on-the-ground research I had hoped to conduct was not possible as borders closed. I had to shift my methodology, as will be explained in Chapter Three, and be adaptive to shifting realities. The scope of the project changed as well. The originally planned comparative case study with two farmer field schools, one in Uganda and one in Kenya turned into a single case study in Kenya. I have edited out the references to the Ugandan site for simplicity and clarity. The research questions below are emergent based on the gaps in this literature review, and how the threads of this literature review paint a cloth of intersectional ideas that work together to explore new spaces, and potentials for educational policy and leadership.
While many of these research questions will not be officially explored as such in Chapter Three and my data, I maintain them in this literature review. There are several reasons for this.

1. They offer a landscape of what these literatures offer to educational policy and leadership, which is a meaningful contribution to the field in and of itself. There are ideas and questions embedded here worth noting and exploring for other scholars. We can often learn more from provocative questions than answers – and as I will note in much of the literatures below, greater wisdom and ideas often come from collective action and diversity of perspectives. It is advantageous in many respects to "hand over" some of these questions to a wider group of people – both scholars and practitioners. I am presenting a complex set of problems; it will take many people to begin finding solutions to them.

2. Many of the research questions are folded into the two questions I do use in Chapter Three. To the best of my ability I came up with two questions that distill the essence of what I am trying to explore in this literature review. I do this while also utilizing the new methodology (photo-voice) that I will discuss in Chapter Three, which allowed for an adaptive pivot with COVID and the need to conduct the research remotely, empowering the farmers to be citizen-scientists and the collectors of the data themselves.

3. To the degree that other research questions are left out, they maintain a utility in that aspects of these questions re-emerge in Chapter Five in my analysis of the findings – as the literature reviews of these threads that point to theoretical questionings often can be seen emerging in the data. An encouraging aspect of the discussion – sometimes also as negations (something didn't work out as hoped). Either way, being able to reference back to those literatures and threads is useful, and maintaining the
larger cloth in this literature review will aid the reader in understanding the data, findings and discussion.

With this context in mind, I will move on to the actual literature review.

**Introduction**

*We are a Star Wars civilization. We have Stone Age emotions. We have medieval institutions – most notably, the churches. And we have god-like technology. And this god-like technology is dragging us forward in ways that are totally unpredictable.* – E.O. Wilson

In this chapter I will delve deeper into the literatures introduced as part of my overall conceptual framework in Chapter One. This includes ecopedagogy in Section One, agro-ecology (referred to interchangeable as permaculture) in Section Two, farmer field schools (FFS) in Section Three, gendered issues in agriculture and SSA in Section Four, Gender and Critical Literacy in Section Five, and finally Improvement Science and NICs in Section Six. I think of each of these literatures as a thread that together help weave the cloth that helps to consider better both the questions and possible answers to the ideas I am exploring. As I delve further into each section I will demonstrate how emerging threads tie back into previous ones to build the conceptual frame I am developing – an intersection of ecopedagogy and improvement science. Their intersection offers a new way to understand educational policy and leadership, and how to better create curricula with potential to address SDG 4.7, and empower local citizens as adaptive leaders. As this is an emergent process I am exploring, some of the ideas will end up proving more/less relevant to the intended and attained curriculum, and others will become more a part of a greater research arc that I have
that will go beyond the scope of this dissertation. Yet all the threads serve as part of the cloth I am crafting.

Further, I will pull out threads from this interweaving of literatures that speak to problems or gaps in the literature for interrogative questions. This will demonstrate how the research questions emerge either from the literatures themselves, or the conceptual framework I am creating. While I name a myriad of such research questions that are emergent via this process in the literature review, not all of these will be examined in the actual doctoral research. I will narrow down my actual research for the doctoral components of this research arc in Chapter Three. These justifications will consist of questions which I have found both worthy of attention (beyond just my own curiosity) for some explicit logic offered and are within the scope of this dissertation to potentially address.

Section One: Ecopedagogy

Building on Critical Theory, Eco-pedagogies extension into critical global citizenship

Our challenge is to create a new language, even a new sense of what it is to be human. It is to transcend not only national limitations, but even our species isolation, to enter into the larger community of living species. This brings about a completely new sense of reality and value. –Thomas Berry

Ecopedagogy builds upon critical pedagogy and the theories and practices of critical theory (G. W. Misiaszek 2020; Gadotti 2010a; Kahn 2010). Praxis is the combination of a deep theoretical understanding of how historical and social phenomena interact that is then linked to action for the purpose of systemic change. Critical theorists contrast banking education and critical consciousness (leading to praxis) as the outcomes that can lead either to the oppression of humanity or her liberation. “The former [banking education] attempts to maintain the submersion of consciousness, the latter strives for the emergence of consciousness and critical intervention in reality” (Freire, 1970, p. 68). Critical intervention
in reality is praxis, as I stated elsewhere, “critical consciousness, a painful birth that transforms us, requires that we in turn seek to transform the world” (italics in original, Epstein-HaLevi 2019).

As Benavot notes:

“Education shapes learners' knowledge, values, behavior, and perspectives, it also contributes to their acquisition of competencies, skills, concepts of tools that can be used to reduce and even halt unsustainable practices and built resilience in the face of environmental degradation and the impact of climate change” (2017, p. 1).

It is for this reason that many in the global educational community and global policy community have dedicated one (number four) of the Sustainable Development Goals (out of 17) to focusing on leveraging education to help shift the paradigm to a regenerative model that will bring us back into harmony with our ecosystems and one another (worth noting, and with one another as Target 4.7 includes both education for sustainability and global citizenship education). In this regard, those focusing on global educational policy and leadership around the SDG and Target 4.7 may be very interested in the movements going on within ecopedagogy and specifically within what I will argue in this dissertation are the curricular manifestation of ecopedagogy as a NFE farmer field school utilizing a permaculture based curriculum. If this bears out, it could be one way in which to implement Target 4.7 with adult learners across rural landscapes. Where there may be even more overlapping interest for educational policy makers, and those doing work within the SDG and Target 4.7 arena with attention to this dissertation, is within another space that Benavot has recently highlighted: that most of the attention paid to the power of educational leverage for change has been within the schooling system, leaving out adult learners (Benavot 2018). As Benavot notes, this leaves out adult learning and education (ALE) and a growing population

---

12 SDG 4.7 states "By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development.”
as adults are living increasingly long lives, including in economically developing nations, and with climate refugees are also often playing an increasingly important role in climate resilience and knowledge transfer of systems. To meaningfully achieve the goal of education for all and sustainability, more attention and care must be giving to adult literacy.

Ecopedagogy is a critical literacy that particularly in this doctoral research attends to minimally literate farmers using a farmer field school delivery for NFE design with an innovative curriculum. This empowers the curriculum to address content specifically rooted in the interdisciplinary content around Target 4.7, and will have obvious interest to such policy makers and educational leaders.

Within this section on ecopedagogy I will survey the small but growing interdisciplinary research and wisdom situating ecopedagogy within a theoretical framework of critical theory based on Friere and Illich’s thinking (Freire 1970a; 2004; Illich 1970). It is because of eco-pedagogies framing within critical discourse that it diverges from environmental education (also sometimes called education for sustainable development). Environmental education does not typically unpack the historically constituted reasons that various problems exist, environmental education (EE) stays within a narrower critique of a root-cause analysis in its attempt to explain “how did we get here?”

As Gonzalez notes:

During the last thirty years, EE incorporated into the primary school curriculum is limited in scope, troubled with biases and distortions that have not helped the programmes’ target population to understand the complex nature of the environment, not to mention the thoughtful, prudent use of the world’s natural resources to satisfy the needs of humanity. (Gonzalez Gaudiano 2007, p. 156)

Environmental education has often been reduced to focus on manners in which consumption habits (for example) can alleviate pressures on our ecosystems (Gonzalez-Gaudiano, Bonilla,
and Sanchez 1999), or how the burden can otherwise be shifted on to individual behaviors, thus ignoring the systems that perpetuate the problems we are dealing with (Kempf and Palast 2008) and absolving the need for collective impact and systemic change. Over thirty years ago, Stevenson noted that “the critical and action orientation of environmental education creates a far more challenging task for schools” (Stevenson 1987, p. 73) which is why EE became “remade” in this way to defang it of the more systemic elements. As schools and policy adopted EE it often lost its critical voice in order to be more palpably adopted within the education system. Yet over the course of those thirty years since Stevenson remarked on this, the problems facing us and the inequalities resulting from a degraded environment have only worsened.

Ecopedagogy, however, is firmly based within a critical discourse, and is one that views as fundamental the importance of unpacking the dynamic roles between social degradation and environmental degradation (Greg W Misiaszek 2010; Greg W. Misiaszek 2020).

Conscientization and social justice position ecopedagogy as a radical movement is dedicated to changing power structures, thereby making it largely oppositional towards institutional cultures and frameworks that tend to perpetuate the status quo. As Kahn puts it, “a northern ecopedagogy must be concerned with the larger hidden curriculum of unsustainable life and look to how social movements and a democratic public sphere are proffering vital knowledge about and against it” (2010, p. 22). Ecopedagogy is an interdisciplinary mode of thinking that exists within a radical pedagogical framework and critical attitude towards existing structures and ways of being. However in the Freirean tradition it is also critically aware that such deconstruction must be accompanied by hope and the ability to envision a better present and future (Freire 1970a; hooks 1994). It is for this reason that critical global citizenship, coupled with mechanism for collective impact and
improvement, lend themselves to elegant intersections with ecopedagogy (G. W. Misiaszek 2018). Collective impact and improvement science are inherently models that want to seek out hope – to seek out ways to make something better and find iterative pathways to getting there – not just to deconstruct, but to construct something more beautiful.

Critical global citizenship represents another rapidly emerging shift in consciousness related to such a praxis. Carlos Alberto Torres describes global citizenship as a new ethic with twelve embedded ethics. Included among these were (ethic #9) to “enhance the threshold of a new global consciousness” which, importantly, he notes must be cultivated by researchers and teachers through engaging in more “participatory action research” methodologies (Carlos Alberto Torres 2017, p. 9). As I noted elsewhere:

Torres explicitly tied this in to his final ethic (#12) that in “an increasingly interdependent world, GCE promotes a sense of belonging and active responsibility to the global community and planet. It emphasizes a shared common humanity and destiny between people and a critical stewardship of Earth’s biosphere and natural environment” (Ibid). As Maocir Gadotti points out in the same issue, this stewardship cannot be disconnected from a profound ethical reference point of “planetary civilization and deep ecology… Planetary citizenship supposes the recognition and practice of “planetarity”. In other words, it treats the planet like an intelligent living being in evolution” (Ibid.). As Greg Misiaszek points out the “planetary level of citizenship” (Greg William Misiaszek 2017, p. 56) interconnections between all things, and how we must push our ecopedagogies to unearth the socio-environmental connections that are so commonly left out of our curriculum in the name of ‘development’ (for some) at the cost of destruction for others. (D. Y. Epstein-HaLevi 2019)

It is for this reason that Torres (among many others) is calling for teachers and academics to strive for such praxis by embracing participatory methodologies, rooted in democratic ideas. The methodologies of improvement science (Section Six) offer one such example for a well-developed participatory methodology – NICs and Positive Deviance - to engage in rigorous but meaningful measurement, co-designed by the people, for the purpose of their own betterment and that of their environment (Pascale, Sternin, and Sternin 2010; A. Bryk, Gomez, and Grunow 2011; Berwick 2003). This world view explicitly advocates that
researchers must engage in participatory action research, become users of the knowledge we generate—shared with the wider community, and help transform our reality into a more peaceful planetary society (Abendroth 2009; L. T. Smith 2012), thus challenging more traditional approaches to what the roles of researchers should be (see also Torres 2017; Misiaszek 2017).

In this next section I will examine concrete examples of how eco-pedagogical ideas are being implemented in formal and non-formal education settings, and address gaps in the knowledge via my research questions that emerge as a consequence. I will braid in other concepts into this conversation in the following sections that focus on agro-ecology and the NFE curriculum of agro-ecology in permaculture13 (Section Two), and the modification/application of this curriculum in farmer field schools—a specific NFE setting (Section Three). At the end of Section One on ecopedagogy, I will provide a philosophical framework utilizing a place-based philosophy to interpret some of the wide ranging ideas and thinkers who are beginning to build a network of shared values and purpose around a problem of practice within ecopedagogy. Such a place-based philosophy fits naturally within the larger framework of the critical global citizen of Torres and others.

Situating the human-animal within the bio-ecological sphere AKA Humans as Lovers of Life

_The child of a certain rabbi used to wander in the woods. At first his father let him wander, but over time he became concerned. One day he said to his son, “You know, I have noticed that each day you walk into the woods. I wonder why you go there?” The boy answered, “I go there to find God.” “That is a very good thing,” the father replied gently. “I am glad you are searching for God. But, my child, don’t you know that God is the same everywhere?” “Yes,” the boy answered, “but I’m not.”—Richard Louv_

Critical theory and discourse initiated new ways of thinking about society, culture, and institutions (Marx & Engels, 1978; Fromm, 1963; Adorno 2007). Friere (1970) and Illich

---

13 Permaculture is perhaps the best example of this school of thought (agro-ecology) being applied to an ever more delineated and organized curriculum (Mollison 1997; 1988)
(1970) built upon this body of knowledge and began to apply their critical analysis specifically in regards to the role of schools, literacy, and institutional forms of education.\textsuperscript{14} Such thinkers brought to light critical reflections about education in an increasingly material and mechanized world, a world that has become dominated by Taylorism and fragmentation where standardization and control of the workforce are seen as the heights of efficiency and productivity, be that in education, healthcare, industry or most any global neoliberal industry (Conklin 2005a; Berwick 2003; Doray 1990; Weber 2002). Fragmentation is anything that separates people and prevents collaboration (Conklin 2005). There are numerous aspects however to such fragmentation. As was noted in Chapter One, wicked problems are inherently socially complex, and therefore part of what tends to drive such fragmentation derives from this social complexity. Meaning, “if you can’t agree on what the problem is, how can you be aligned on a solution? Social complexity fragments team identity…social complexity also fragments meaning- key terms and concepts are used in different ways” (Conklin 2005, p. 22) by the different people involved in identifying and solving the problem. Taylorism was able to achieve an enormous amount, and bring about efficiency of design (depending on what we mean exactly by efficiency of course) – so that for example cogs could be created en masse. Not a simple feat (Doray 1990). However this also required, by design, and with much deliberate purpose, a standardized and fragmented approach to industry, and typically a top down command and control attitude to production (Berwick 2003). People were turned into automatons. This approach in industry was then broadened into many other professions, including health care and education as these areas came under the force of Taylorism [think standardized testing and more rigidly designed daily lesson plans and timed curriculum given to teachers to implement, a profession turned

\textsuperscript{14} Illich as many readers may know, was a bit different from the others, in that he began the movement/idea to actually "deschool" society – what we had to unlearn and ways that schooling structures needed to be unwound.
more into teaching as implementation puppet) (Ibid.). Modernity and perhaps in particular consumer society, would likely not exist as we know them without Taylorism. But Improvement Science has taken a very critical approach to this, particularly with the rise of the wicked problems, which will be discussed more fully in Section Seven (Doray 1990; Green 2008; A. S. Bryk et al. 2015). A main critique I will briefly touch on here that IS offers, is that the complexity of the problems we face today can’t be addressed with a Tayloristic approach, and require instead a fundamentally different mental model for improvers, leadership, and the workforce (Lucas and Nacer 2015; Senge and Kleiner 1994).

![Figure 1: Systems Thinking and Improvement Science (Lucas and Nacer 2015, p. 8)](image)

Critical thinkers and psychologists have pushed back on this mechanized view of the human being (Bronfenbrenner 2004). Bronfenbrenner notes the fragmented disciplines and knowledge being generated by industry of the 20th century has resulted in such a radical
altering of our environment that the “conditions conducive to…the process of making human beings human is being placed in jeopardy” (Ibid. p. xxvii). In response to this, a need for a praxis that can critique these modes of civilization, and recreate spaces for life on our planet has emerged as a counterforce. One such counter force that has developed from a long tradition of critical thinkers is the field called ecopedagogy (G. W. Misiaszek 2020). As noted in Chapter One Ecopedagogies represent an intersection of numerous concepts. I will reiterate these concepts below (followed by Figure 2, visualizing how these concepts interact), and then expand upon their definitions here in Chapter Two immediately following the reiteration of this list:

- **ecoliteracy** (M. K. Stone and Barlow 2005; Margulis 1999; Louv 2008) an awareness of ecological systems and the dynamic human relationship to them,

- **biophilia** - the love of life and life sustaining systems (Fromm 1973; Wilson 1984; Arvay 2018; Lovelock 2000)\(^{15}\),

- **conscientization** (e.g. social/environmental justice) and liberatory praxis within ecopedagogy, including critical global citizenship (Antunes and Gadotti 2005; G. W. Misiaszek 2010; 2015; Freire 2004; G. W. Misiaszek and Torres 2018; G. W. Misiaszek 2017),

- a way of thinking about the world and oneself as interconnected, what Thich Nhat Hanh calls “interbeing” (1987),

\(^{15}\) This idea has been contrasted with the idea of civilization, itself as a structure, being one that is built upon necrophilia, a death loving culture. This idea, elaborated on by the philosopher Fromm (1963), also made explicit the contrasting idea of love to that of a death loving cultures. Fromm concludes his work “The Art of Loving” by writing, “Society must be organized in such a way that man's social, loving nature is not separated from his social existence, but becomes one with it. If it is true, as I have tried to show, that love is the only sane and satisfactory answer to the problem of human existence, then any society which excludes, relatively, the development of love, must in the long run perish of its own contradiction with the basic necessities of human nature.” To which he contrasts this in his final sentences by pointing out that “this need has been obscured…does not mean it does not exist. To analyze the nature of love is to discover its general absence today and to criticize the social conditions which are responsible for this absence” (Fromm 1956, p. 133).
and how it functions as a critique of civilization itself (Kahn 2010; Quinn 1992; Bauman 2003).\textsuperscript{16}

\textbf{Figure 2: Embedded concepts of eco-pedagogy}

Eco-pedagogy positions itself within a host of value statements and beliefs. Biophilia, the love of life and living systems, is an articulation of one such value (Feynman, 1964; Margulis, 1999). E.O. Wilson posited the biophilia concept and stated it is an evolutionary “urge to affiliate with other forms of life” (Kellert and Wilson 1995, p. 416). As noted however, he was building on the works of the psychologist Fromm, who himself was relating to critical theorists and the ideas of necrophilia, that civilization was becoming a death loving

\textsuperscript{16}A fictional accounting of this viewpoint that is based on research but written in narrative form can be found in the best-selling trilogy Ishmael by Daniel Quinn (1992)
and death creating mechanism, to which we must oppose this force with biophilia. These interdisciplinary spaces have been bridged more recently by evolutionary psychologists (see Kellert and Wilson 1995). By extension, rich and vibrant eco-systems that foster a greater diversity of life are valued over behaviors that diminish an eco-system to fewer and more homogenous forms of life (Wilson 1984). Less diverse communities are significantly less stable, in part because they are less capable of absorbing shocks to their ecosystem (Barnosky et al. 2011). Evolution selects for diversity because it is a basic survival strategy (Darwin and Huxley 2003). This idea, extended to human culture and epistemology, has been picked up by scholars recently, who have considered how it is at the moment when we are witnessing some of our most complicated and extraordinary problems, that we are also witnessing the greatest threat to the diversity of human cultures and epistemologies, who may hold the diverse viewpoint and wisdom we need to solve the problem (see e.g. Orr 2004; Arvay 2018; Quinn 1992; Gruenewald 2007; Loy 2019). We may literally be killing the solutions to our problems or how to think about ways of generating knowledge to solve our problems (Santos 2014; Orr 2004). This is an extension of the same evolutionary logic. One of the offerings of this dissertation, by taking a PAR and collective action model approach, is to re-embrace a widening of epistemological voices to be considering in how we think of a problem(s) and answer(s).

“Interbeing” situates the field within a world view that sees the self as deeply connected with other human selves, with other species and life forms, and with the non-living elements of our world and universe as well (Hanh, 1987, 2010; Shubin, 2013). Interbeing also expresses the idea of codependent arising – an epistemology that captures the idea that all nouns are illusory – all things are emanations of one. To illustrate this idea, Thich Nhat Hanh counsels us to meditate in such a way that when we eat our food we consider, for example, being able to see garbage, clouds, rain, and rocks within our orange. How so?
Embedded within that orange is the waste it will decompose into, the rain clouds whose water nourished the orange tree from which it grew, and the minerals in the soil which came from the eroded rocks. Or if we want to push this even further, we know, as E.O. Wilson calls it in the Epic of Evolution, that our Last Universal Common Ancestor (LUCA), the last organism from which all life on this planet shares a common ancestor with some ancient bacterial origin, literally emerged from the interaction of the right mixture of energy with water and the ingredients from minerals and rocks. That is life and non-life also share a history and have intersection. This is what is meant by codependent arising, that all nouns are illusory. Another noun Thich Nhat Hanh coined to try and capture this alien concept to the English language was “inter-are” – we “inter-are” with the rocks, the soil, the bacteria, with everything that is around us. This is what Alan Watts means when he declares that “billions of years ago, you were a big bang, but now you’re a complicated human being. And then we cut ourselves off, and don’t feel that we’re still the big bang.”17 This is perhaps a bit different from Thich Nhat Hanh’s idea in that Alan Watts holds in tension the dualities (although perhaps Hanh is as well) that on the one hand we are still a part of this co-arising process of the universe, and at the same time we are also “an aperture through which the universe is looking at and exploring itself” (Watts 1960).

The use of this aspects within ecopedagogy exposes us to a variety of concepts: from interbeing, to a new variety of critical literacy, or the embrace of the value of biophilia and the notion that diversity is an inherent and hard wired value within humanity. All of these embedded concepts have implications for how we consider wicked problems, fragmentation, and our current siloed thinking and societies. They have implications for how we may evaluate what matters in education, and in this specific case, for ALE within FFS

17 For a beautiful video montage created to a snippet of this lecture see https://www.youtube.com/watch?time_continue=6&v=C0T9icPl3rw
programming. In the subsequent sections of this chapter I will take aspects of each of these
embedded concepts, and show how they interact with another literature (for example critical
theory, or improvement science) and draw out from those interactions specific research
questions. (For ease of reader reference research questions are denoted in the table of
contents). Recall that these research questions are those that are emergent from the literature
review based on the gaps and rationales that emerge. While they form the research arc I wish
to pursue, I will narrow these down in Chapter Three to two more focused and feasible
questions for this doctoral research, utilizing methods to be discussed in that chapter. The
questions that don’t fold into that process, remain noted here as part of this unfolding via the
cloth being created from these threads – and are questions I intend to return to after this
doctoral work is completed.

Before moving on – another noteworthy way of considering how ecopedagogy is
being manifested in curricula, is via the emergent Sustainable Development Goal Target 4.7 –
which is one of the broadest goals in the SDGs and the only one that incorporates many of the
curricular criteria around concepts related to ecopedagogy (G. W. Misiaszek and Torres
2018; Carlos Alberto Torres 2017a). Target 4.7 states:

By 2030, ensure that all learners acquire the knowledge and skills needed to promote
sustainable development, including, among others, through education for sustainable
development and sustainable lifestyles, human rights, gender equality, promotion of a
culture of peace and non-violence, global citizenship and appreciation of cultural
diversity and of culture’s contribution to sustainable development.\textsuperscript{18}

The interrelatedness of so many threads – as noted as exist within ecopedagogy as
well – make these two concepts inevitably related in how they approach this complex system.
Moreover, in terms of curriculum, they are also evolving in similar, albeit perhaps different,
ways. However they are worth keeping in mind together, especially as so much global work

\textsuperscript{18} See uis.unesco.org/sites/default/files/documents/gaml4-measurement-strategy-sdg-target4.7.pdf
is being done with regards to Target 4.7 – as Benavot notes in a recent book chapter as part of a much larger edited series for Nissim on this subject, that emergent global textbooks are beginning to think through how educational indicators and content can actually think through how to embed Target 4.7 (Benavot 2019). This is a rather revolutionary change in educational curricula. What ecopedagogy is attempting to do as an educational policy is a parallel tract to this, or perhaps it should be thought of as a thread within the world of Target 4.7 using its own set of indicators that contribute to this emergent space for educational policy. One could think of it in the reverse influence/flow as well, these new policies and SDGS are emergent as a consequence of the influence of the growing critical consciousness of such issues (aka. ecopedagogies).

Ecopedagogy, Wisdom, and Valuing Life: The First Research Question

*Because the relationship between self and world is reciprocal, it is not a matter of first getting enlightened or saved and then acting. As we work to heal the Earth, the Earth heals us. No need to wait. As we care enough to take risks, we loosen the grip of ego and begin to come home to our true nature.* –Joanna Macy

Ecopedagogy builds on a long history of ideas relating to human wisdom and forms of meaning making, but situates these ideas in a different narrative. By briefly reviewing some of the history of these ideas I can better understand where ecopedagogy fits in, and the different direction it points us in as meaning making creatures.

Proponents of multiple intelligence theory have recognized the importance and value that nature/other species have in human life as one way of thinking about and interpreting our world (Gardner, 2006). More generally, many proponents of “wisdom” as a category of philosophy and ethics recognize the vital role that nature based activities as simple as star gazing have had on the development of philosophy and wisdom, with some even pointing to
such natural contemplation as the root source of all philosophy (Kass, 2006; Wall & Arden, 1990). Alan Watts, a comparative religion scholar, makes compelling arguments that such a nature based cosmic consciousness is what Jesus was preaching in the gospels (Watts 1971). If we define wisdom not only as the collection of knowledge and facts, but as a synthesis of those data into meaningful forms, then our ability to be critical, reflective, and interpretative are fundamental to our capacity to foster wisdom. Friere talks of the importance of situating ourselves as meaning makers within our context and world (1985). There is a long tradition to thinking of humans as unique in this capacity of a meaning making species (Aristotle, 2009; Nietzsche, 1989). However, all too often we limit the context of human beings in relation to other human beings or to the cultures and institutions in which those humans operate, while cutting off and segregating the much larger world and environment in which this human interaction occurs, indicating an implicit value that such elements are not (as) valuable. We have also used our meaning making abilities to denigrate the value of life of other species, often in great ignorance of the extraordinary capacities that other creatures have, as modern research continues to reveal in stunning detail some of the mysteries of the ways that other creatures perceive and make sense of our world (Waal 2017). Such narrowly construed (often scientifically inaccurate see Casey 2015; Montgomery 2016) and anthropocentric approaches to knowledge are antithetical to ecopedagogies.

Ecopedagogy challenges this assumption of human superiority, and seeks to rediscover and integrate the animal Homo sapien, what Freire calls the “human-animal” (1976 p. 80) back within the wider ecological systems in which homo sapiens exist, observe, and interpret their worlds (Alessio 2008; Scully 2003). It challenges the idea that humans have “some privileged place” (Sagan 1997) within the cosmos, and are entitled to rule with power or cruelty over what many regard broadly as ‘Creation’. Instead, it promotes the
radical notion, that we are deeply intertwined with and within our ecosystems, and that we have a shared responsibility to foster life given our power and reflective capacities.

Thus a key research question to emerge from this literature on eco-pedagogical values is:

Research Question One: In what manners does engagement with eco-pedagogically aligned curriculum impact the related values such as biophilia and inter-being of participants?

Sub-questions:

- Are there indications of biophilia within the curriculum?¹⁹

  - Such indications could take on a wide variety of expressions – but at its heart there should be just that – heart. Something passion should be coming through in the curriculum that is pushing beyond the rational to encourage participants to consider what their emotive spaces, inter-relational spaces, spiritual spaces, and so forth are as well when considering their relationships to life. This could be, using examples I have seen from real curriculum, creative writing exercises about the story of a tree, a blade of grass, imagining the consciousness of other-than human minds and what alternative ways of thinking such minds may have (for instance, what is it like to smell time – something that dogs can do). Etc. There are ample examples from science curriculum for how such biophilia has been captured and I will be on the lookout

¹⁹ Perhaps measured as diverse crops, diverse bacteria load in soils, or cultural/human diversities that are secondary outcomes of this value of biophilia, etc. I can imagine various creative ways in which respondents and the designers of the courses may be considering how this value is/n’t integrated and/or expressed/measured, which is part of what I will synthesize and deal with in Section Six.
for any of them, as well as new, creative, emergent and hopefully unexpected manifestations.

- If so, how are participants able to demonstrate an increase in their valuing of diversity for life?
  - Some possible indicators: Care for soil, cultivating more diverse insects – and not just for nutrition or soil ecology but also for aesthetic articulations or joy – it could be indicated by an increased interest in knowledge about local ecosystems, flora, fauna, invasive species, migratory patterns that can be witnessed (or enhanced by planting certain foods or creating the right water systems etc.)

- Is “inter-being” expressed within the curriculum?
  - Possible indicators: Expressions of interdependence across ecosystems/being. Expressions of inter-relationality. Likely to use alternative language/epistemologies that capture similar ideas but with their own “feeling”. Scientific stories like those told in “Your Inner Fish” or “The Universe Within” by Neil Shubin (2013) or the teachings of thinkers like Alan Watts are other examples of such manifestations. Many of the writings of Mollison, founder of permaculture, express aspects of inter-being as they discuss profound relationships between human beings and environment that extend to the spiritual.

- If so, how are participants exemplifying that ethic? For example by utilizing biobiomimicry in their farms.
A Time for Praxis: The Second Research Question

*Everything is burning.* – The Buddha

I will further examine in Section Six how this question can be understood as an element of a core principle of the “problem of practice” within Improvement Science. A problem of practice defines a shared problem, typically a complicated cross disciplinary and intersectional problem, that a network attempts to more fully (and purposefully) describe, observe, and understand, in order to engage in meaningful attempts to interrupt and address root causes of what is driving the underlying systemic causes of the problem. Biophilia and inter-being are at the heart of a problem of practice for ecopedagogy in curricular values.

The values, purposes, and functions of ecopedagogy critically depend on the values one assigns to education itself. For thinkers operating within the school of critical theory, there is a belief that education should foster empathic, loving, happy, wise, curious learners (Noddings, 2005); as well as the ability to make meaning of our worlds in critical and reflective praxis (hooks, 2009). This critical reflective process is based on the belief that life can be meaningful, and that people can effect change. In talking about his own time spent in prison for his educational work, Freire reflects that, “men and women are human beings because they are historically constituted as beings of praxis, and in the process they have become capable of transforming the world – of giving it meaning” (Freire, 1985, p. 155). This key idea of Freire’s – praxis – is summarized nicely by Mark Smith:

Paulo Freire was concerned with praxis – action that is informed (and linked to certain values). Dialogue wasn’t just about deepening understanding – but was part of making a difference in the world. Dialogue in itself is a co-operative activity involving respect. The process is important and can be seen as enhancing community and building social capital and to leading us to act in ways that make for justice and human flourishing. Informal and popular educators have had a long-standing orientation to action – so the emphasis on change in the world was welcome. But there was a sting in the tail. Paulo Freire argued for informed action
and as such provided a useful counter-balance to those who want to diminish theory. (M. K. Smith 2002)

This idea of theory informed practice (praxis) is closely aligned to elements I will investigate (Networked Improvement Communities) – in particular avoiding what is called solutionitis. To briefly introduce the idea here, as it relates, is simply that if we have not sufficiently described, understood, reflected upon, and correctly theorized a theory of change or a theory of action around a specific phenomenon, then we will inevitably engage in “solutionitis” – a group think mentality where a reactionary appeal to a ready-made solution that is appealing to a group of people is assumed to be reasonable before the problem itself has been properly unpacked, considered, and understood. Whatever our intentions may be, our attempts to address a problem are likely to only compound it when approached this way.

For example, a school wants to try and improve completion outcomes for a secondary school and convenes teachers and administrators to “solve” this problem. They immediately begin to discuss potential solutions, and “brainstorm” potential solutions, before really digging into what the actual problem itself is. They may come up with a number of potential solutions such as incentivizing students with external motivations, punishment such as restricting access to desired activities like sports clubs and social events unless grades or attendance are maintained to a minimum threshold, increasing advising and counseling access, increasing outreach to parents, etc. Any or all of these may be effective interventions. These are all examples of solutionitis. To try and address a problem, first it must be correctly understood, and for Freire this begins with correctly being able to name and reflect upon it.

Critical literacy will approach learning with an emphasis on maintaining the historically constituted and contextualized nature of such ideas as paramount. This attitude embedded within critical consciousness, and the hopefulness required to impact change, are other paramount values at the core of how such a theory of action is oriented. This matters
because it means that those exposed to a curriculum rooted in critical literacy shouldn't just be able to deconstruct a complex problem, but should also still be able to have a positive attitude towards impacting change. This is something that can be interrogated, both at the individual and collective level, this is where a politics exists, and that is part of the framework of critical literacy. Those who only engage in problematization, and offer a critique that is a staring into an abyss, but offer no hope, or worse, encourage those who they consider to be becoming “woke” to become disenfranchised, overwhelmed, and feel as if there is no point in attempting to try and change something are not critically conscious. Critical consciousness requires praxis, meaning it requires movement towards systemic change (White, Blatz, and Joseph 2019; Edmondson and Zimpher 2014; G. W. Misiaszek and Torres 2018; G. W. Misiaszek 2020; Carlos Alberto Torres 2017b). I will demonstrate how this critical orientation overlaps closely with much of the improvement science literature because of its articulation around ideas about collective impact. To this end, a second question I want to ask is around the ways in which a critical orientation has/n’t led participants to feel empowered to not just critique and articulate what the problem(s) are, but to also consider manners in which to impact them.

_Research Question Two: In what manners do participants in ecopedagogy programs believe that they are capable of engaging in collective impact to effect systemic change?

Ecopedagogy as Freirian Praxis - Moving Beyond Civilization: The Third Research Question

_Civilization is a disease almost invariably fatal unless the cause is checked in time._ – Dean Inge

_The apocalypse is not something which is coming. The apocalypse has arrived in major portions of the planet and it’s only because we live within a bubble of incredible privilege and social insulation that we still have the luxury of anticipating the apocalypse._ –Terence McKenna
Ecopedagogy is based on a transformation in consciousness that leads to action (praxis). By its very nature this praxis creates a new “ethical and social reference – planetary citizenship” (Antunes & Gadotti, 2005). The Earth Charter is an example of the manifestation of this critical consciousness.

Faced with the possibility of planetary extermination, the Earth Charter presents alternatives based on a culture of peace and sustainability. Sustainability does not imply only biology, economy, and ecology. Sustainability has to do with the relationship we have with ourselves, with others, and with nature. Pedagogy should begin, above all else, by teaching how to read the world, as Paulo Freire taught us – a world which is the universe, because the world is our first teacher. Our first education is an emotional education, which places us before the mystery of the universe, in close contact with it, producing in us the feeling of being a part of this sacred, living being, in continuous evolution. (Antunes & Gadotti, 2005 p. 138)

This is not just theoretical or philosophical musings. The Earth Charter has been implemented, for but one example, in both formal and non-formal educational settings across Brazil in six Brazilian cities with thousands of teachers and hundreds of thousands of people being exposed to this curriculum (Inojosa 2010). This included over 250,000 people in the Paraná Basin alone being introduced to this curriculum, where 70 separate infrastructure projects using more sustainable water harvesting have been implemented using the Earth Charter as an ethical guiding framework (Vilela 2007; Earth Charter Initiative 2019; Inojosa 2010). In Michoacán, Mexico the Earth Charter has been implemented using theatre of the oppressed exposing thousands of students to “an artistic expression which can be done through music, theatre, dance, or poetry” as they consider the meanings of the ethical frameworks of the Earth Charter (Vilela 2007). In Costa Rica it (the Earth Charter) has become something recited daily in schools as part of a new ethos of what global citizenry means regarding responsibility to humanity and earth as a result of efforts coordinated by hundreds of NGOs and the Ministry of Education/Environment and UNESCO to implement...
the UN Decade for Education for Sustainable Development (Vilela 2007). In Spain, the University of Alicante, Granada has taken up the Earth Charter in coordination with the Ministry of Education and Fundación Valores, a non-profit organization comprised of educators focused on implementing the Earth Charter and fostering more sustainable practices in education (Ibid.). This praxis has in turn fostered the raising of a critical consciousness within an eco-pedagogical model (Gadotti, 2010). This is directly linked to the kind of critical civil literacy, and global consciousness that many scholars are now calling for as fundamentally necessary to prevent ecological disaster, and to preserve/restore/create meaningful political democracies (C.A. Torres 2015; G. W. Misiaszek 2017). Most of these initiatives are quite new, being several years old or a bit more, and have had, as far as I have been able to discover very little formal evaluation studies done thus far on their impacts. Some exceptions have been on those that have impacted infrastructure projects (like the ones in Brazil) as well as some evaluation studies that have qualitatively measured how Earth Charter projects are impacting empathy and concepts like inter-being and considerations of “help[ing] people realize that when basic needs have been met, human development is primarily about being more, not having more” (Roca 2011, p. 273).

Several thousand kilometers north of that implementation in Brazil we can observe the work of Majora Carter, a major ecopedagogy activist and community organizer in Bronx, NY. She has recreated green space and jobs, and accomplished significant non-formal educational work within an eco-pedagogical framework. Her work has been focused on raising the ecoliteracy consciousness among the inner-city Bronx inhabitants. In her TED talk “Greening the Ghetto” she speaks of how “environmental degradation begets social degradation” (Carter, 2006). This degradation is ever-present, in divergent geographies and

---

20 For a full list of affiliate organizations with formal associations with the Earth Charter around the world see http://earthcharter.org/about-ec/c/affiliates/

21 For a fuller discussion of the emergent influence of “bio-democracy” as a political discourse see The Earth Charter and Biodemocracy in the Twenty First Century by Matthew T. Riley (2014)
landscapes. It is such hidden links between environment and social degradation that Freirean based critical literacies seek to unpack and make explicit to make more plain the hidden motivations and behaviors of oppressors and oppression (Greg W. Misiaszek 2010). Carter describes the “toxic neighborhood” (Carter, 2006) of many such inner city and slum ecosystems, and the inevitable higher rates of mortality and morbidity that such residents face due to environmentally related diseases and health issues that are exponentially more common among African-Americans than their white counter parts; counter parts who often live only kilometers away (Kozol, 1991). While discussing the obesity epidemic within the inner-city Black population of America, Carter rhetorically asks “why would you go for a brisk walk in a toxic neighborhood?” (Carter, 2006). Love has written a recent book that well documents the systemic components of such economic and political abandonment of neighborhoods of color, and the intersectional ways this has impacted the human beings who live there, with a particular focus on the educational abandonment (Love 2019). Notably, in taking a critical literacy approach, Love also spends in entire chapter on "Black Joy" and notes the importance of focusing on love, joy, and happiness as part of any abolitionist movement, just as hope is required for critical literacy in the Freirean tradition. Again, within this framework very clear attitudinal dispositions should be showing up in the attained curriculum if this is what is being conveyed in the teachings of such an NFE. This speaks to those who have been left behind, which exist in both developed and economically developing nations alike (UN Women 2018). Young men and women in the South Side of Chicago at 16 and 17 years of age are more likely to have born witness to violent trauma, including murder, (and eventually be imprisoned where violence is endemic) than were U.S. troops serving in the Second Iraq War (Chicago Tribune, Sept 2013: Block & Block, 1993). Turning to a personal narrative, one of the only times I saw my high school students from this community cry was when I took them to the botanical gardens on the outskirts of Northern Chicago.
They watched a red tailed hawk fly above them in a pale blue sky. They held the scene in wonderment, with more than a handful in tears, and in reflecting on it afterward, asked why they were deprived of such experiences in their own daily lives (Epstein & Fragnoli, 2011). Tamara Lee Jolly in offering a critical race theory rebuttal to some of the findings in a case study on a NFE mass literacy campaign we recently conducted offered a similar critique, noting the ways in which her secondary students from inner cities when finally exposed to the biophilic experience of Gaia, wondered why all humans haven't always been offered this birthright (Epstein et al in publication 2022). Yet the environmental degradation that environmental justice communities face is often hidden in political discourse, thus erasing the connections between environmental degradation and social degradation, and making addressing many of these wicked problems even more complicated. As Misiaszek puts it, “Although environmental devastation is a key effect and cause of social conflict, this fact is often systematically hidden and thus ignored by most of the population or political[ly] hidden curriculums to systematically sustain and increase hegemony” (2010 p. 471). This cognitive dissonance is described Kozol as savage (2012), and critical theorists call for educators to stand against it (Freire, 2004).

This awareness and an accompanying sense of tragedy informs Kahn’s adoption of a radical position of rethinking civilization itself. He notes that tinkering with the structure will not affect meaningful change (2010). Kahn points out the inherent hypocrisy of the professional environmentalists who are comprised of a class of people that own the production of knowledge, yet tend to come from positions of power and privilege (2010) who directly benefit from maintaining this status quo. For this reason, Kahn points to the need for more democratic methods when engaging in research on ecopedagogy that democratize whose voices are counted as valuable – something that is incorporated into the methodologies of Positive Deviance and Improvement Science I explore in Section Six. “Eco pedagogy
[then] is not a simple addendum to standard curricula, but rather an attempt to raze education under capitalism in favor of a pedagogy of the repressed that seeks to wage revolutionary political struggle toward a future culture based on radical notions of sustainability and a humanized nature that can represent values of tolerance, beauty, subjectivity, and freedom on a cosmic scale [emphasis added]” (Kahn, 2010, p. 140). Kahn does not believe that technology is a saving angel for our current crisis of civilization, for it is the subjects who interpret and use the technology that matter. As Fassbinder put it in his review of Kahn’s book Critical pedagogy, ecoliteracy and planetary crisis: The ecopedagogy movement., “if we are to understand how we are consuming the planet to death, we must seize the opportunity to critique present day techno-poly (the worship of technology) [emphasis added]” (Fassbinder, 2010, p. 464).22 We marvel at our own “progress” as a civilization, by ignoring the devastation this progress was, and for hundreds of millions of people today - continues, to be built on (Quinn, 1995).

In his work Beyond Civilization (2000), Quinn borrows Richard Dawkins idea of the meme. A meme is a self-replicating idea or cultural phenomena based on selection pressures in the same manner as a gene (Dawkins 2006). Quinn identifies three memes that perpetuate human misery, endanger our species survival, and are endangering entire planetary ecosystems and basic sustainability. Those memes are:

1. Western Civilization is the final and highest of all human inventions
2. Ours is the one right way for people to live and everyone should live like us
3. Civilization must continue at any cost and must not be abandoned under any circumstances (Quinn, 2000).

22 Though neither Kahn nor Fassbinder point to Fromm, here again we hear the echoes of the idea of a necrophilic civilization, and whose counterpoint would be one based, as Fromm stated, on love.
Quinn challenges these memes by engaging in thought experiments based on examples from people who have abandoned ‘the one right way’ such as those who are homeless. He doesn’t advocate for this avenue, in fact, in an interview about his book he notes,

Homeless people are beyond civilization in the sense that they’ve been pushed out. Many of them would very much like to get back in (implying however, not all of them would). But at the moment, there’s just no place for them in the system…they have definitely marginalized themselves by choice (via drugs etc.) but it should be noted I’m not recommending homelessness as a way for people to go beyond civilization. -Interview with Daniel Quinn from http://www.ishmael.org/Education/Writings/lycos_chat.cfm

He also uses a comparative lens by analyzing extinct civilizations and societies who willingly abandoned civilization, as well as probing how diverse hunting gathering and tribal societies engaged in alternative forms of societal structures (Quinn, 2000). Quinn helps us imagine what some alternative models may look like. Ecopedagogy incorporates many of these ideas by giving them the academically accepted language that Quinn’s powerful story telling births but lacks as an academically informed novel. However such scholarship, sadly, abounds, as it has become a consensus opinion within fields such as biology and ecology that without a radical new model for our social structures, we no longer only endanger the marginalized people and cultures of the human world, we now endanger entire eco-systems and species (D. Meadows, Randers, and Meadows 2004; Guterl 2012; Barnosky et al. 2011; Kolbert 2014; Inter Governmental Panel on Climate Change 2018).

23 Another controversial and extraordinary claim about just how wrong our notions are of affluence and comfort based on civilizational structures or the “savage” ones of certain types of hunting/gathering societies is Sahlins lecture “Man the Hunter” given in 1966 (Sahlins 1974) and updated in an article for the Pacific Ecologist (Sahlins 2009). This inversion of our mythologies about leisure/labor in different economies/societal structures has also come under attack by the claim that the modern American worker has to put in more labor (by a factor of 7x) than did Feudal peasants of medieval Europe! (Schor 2008) If such claims are borne out, this again points to the dangers of ahistorical arguments that perpetuate mythologies about our value/superiority and are dismissive of so many alternatives that may have manifest data supporting consideration as the basis for alternative development theories.
Human civilization as currently practiced now is engaged in our planet’s sixth mass extinction with leading biologists estimating that over 75% of mammalian life will be extinct within another two centuries (Barnosky et. al. 2011). This system is much more than a failed experiment. It embodies what Fromm referred to as our necrophilia as a civilization (1963) a death loving and death creating system – in direct opposition to the biophilia value so central to ecopedagogy. Ecopedagogy provides us with tools (such as …) for engaging in critical thought and praxis to help us navigate our way out of the failure of civilization and reconstitute a more honest historically situated reflection of our current conditions.

Considering the ways in which ecopedagogy seeks to explicate the often hidden connections between environmental and social degradation, one research question that emerges when considering curricular impacts of an ecopedagogical curriculum is:

*Research Question Three: To the extent that eco-pedagogical principles are embedded in a NFE program, do they enable participants to develop a critical voice as to the linkages between environment and society, or between their environment and their community?*

*Sub-questions:*

- Does an ecopedagogy curriculum aid participants in being able to name, describe, and reflect upon the root causes of why things are the way they are?

With this critique in mind, I will now move towards manners in which ecopedagogues have begun to imagine how ecopedagogy can provide hopeful solutions for the problems we face with the place-based approach being a leading candidate for such work. Place-based approached are integral to the eco-literacy component of ecopedagogy, as well as to the inter-being component of ecopedagogy. To some extent- they also (as will be shown) engage with consciousness raising aspects of ecopedagogy. I will show how these braiding of the concepts of place-based approaches work within ecopedagogy in this next section. All of these threads then impact the most hidden component of ecopedagogical literacies – how
economies are embedded within ecologies – and seeing how environmental devastation creates human suffering, and human suffering creates environmental devastation (G. W. Misiaszek and Torres 2018; G. W. Misiaszek 2020).

From Loving One Place to Loving All Place: Eco-Pedagogies articulation of home and love

As it became my home, the wounds that were being inflicted upon it—the insults—became my own (Bass, 1996 p. 6).

There is as yet no ethic dealing with man’s relation to land and to the animals and plants which grow upon it...The land-relation is still strictly economic, entailing privileges but not obligations. The extension of ethics to this third element in human environment is, if I read the evidence correctly, an evolutionary possibility and an ecological necessity. – Aldo Leopold

Give them the fields and the woods and the possibility of the world salvaged from the lords of profit. Stand them in the stream, head them upstream, rejoice as they learn to love this green space they live in, its sticks and leaves and then the silent, beautiful blossoms. Attention is the beginning of devotion (Oliver, 2004 p. 55).

Ann Pelo, a teacher and novelist living in the Seattle, Washington region, beautifully captures how ecopedagogy can be a vehicle for instilling such empathy, love, and curiosity (2009). Pelo posits that in order to love generally, one must be able to love specifically. There is a rabbinic logic model that articulates this hermeneutic in a meme, "כלל פרט וכלל klal, prat, u’klal - general, specific, general" (Baraita of Rabbi Ishmael, translation my own). The meaning of this meme is that humans make observations that lead to a sense of a general idea, from which they investigate if this idea holds in the specific realities of their experienced (or abstracted/intellectual) world. If it holds, they then generalize and project it onto other models that they are perhaps less experienced or sure of, but they assume that the meaning they made from the set of specific interactions can now be applied more generally to other situations as well. I think this psychology excellently captures the way that we can interact with and interpret our world when we are being astute observers. We observe (name), reflect, and then act upon our world based on projects/stories we tell. So how we go about doing so matters. If we generalize from the one story (naming/observing) to the many, it will often be
functional, and it allows us to operate, but it is not always very accurate, and it can create problems in our stories and behaviors. It can misname, almost inevitably. When instead we start with the general principle (a theory) – then go to the specific experience we have ourselves– and then see how that compares to a broader shared understanding (back to the general – the hermeneutic described in this Rabbinic psychology/logic). We have a much better chance of creating a story that more accurately names reality – we are sharing knowledge with others in this manner. We rely on our own experiential knowledge, but still draw on shared knowledge – we access the hive mind (Haidt 2013). Pelo uses this hermeneutic in addressing how ecological identity allows us to situate our lives to our birth:

A particular place, opens children to a broader connection with the earth; love for a specific place makes possible love for other places…we live in a culture that dismisses the significance of an ecological identity, a culture that encourages us to move around from place to place and that posits that we make home by the simple fact of habitation, rather than by intimate connection to the land, the sky, the air. Any place can become home, we're told. Which means, really, that no place is home. (Pelo, 2009 p. 1)

One goal of ecopedagogy is to explicitly give shape and meaning to a learner’s position in space, to give them an identity of home. It is through the identity and love with a specific place, that love to other places can be generalized.

The reverse of this is also true, that when we have no relationship with any one specific place, that we have no love for any place, and that such a way of living is “dangerous…it leads to a way of living on earth that is exploitative and destructive” (Pelo, 2009, p. 2). We can’t care about that which we have no relationship with, and we can’t care about that which we don’t see, observe, and interact with, deeply and intimately. The human who has no sense of place also has no reason to feel an intimate connection with the ecosystem in which s/he lives. We don’t care about that which we don’t see and relate with, it makes our environment invisible, just as geographic segregation based on race and class makes the marginalized peoples of the world invisible.
Pelo discusses six principles that she believes engender a critical ecopedagogy in people: walking the land, learning the names, embracing sensuality, exploring new perspectives, learning the stories, telling the stories (2009). The art and importance of storytelling has been recognized as vital to ecopedagogy (Krug, 2012). Pelo’s testimony of exploration of new perspectives in such a pedagogy is compelling. She gives examples of students in inner city public schools who do field work, journaling, research, and art work around the changing of the colors of leaves, based on the prompt of a curiosity question by a classmate. Towards the end of this project, one of her children stated they believe that,

“Leaves get sad when they start to die.” From this decidedly unscientific conjecture, the children forged a potent connection to the leaves: “Like we give comfort to others when they’re sad, the plant needs comfort.” “I think a hug would help a leaf, and being with the leaf.” “Maybe you could stay with it. You just give it comfort before it dies.” “When it drops on the ground, that’s when it needs you” (Pelo, 2009, p. 10)

It is not difficult to imagine how such empathic praxis that students gain towards leaves can impact the way they interact with and use soil, treat other plant species, and in particular, other sentient species, including other humans.

Ann Pelo examines a different story involving a young girl in the inner city and some ants, as an expression of how our interaction with other ‘lower’ life forms can impact our interpretation of our role and place in the biosphere, depending on the lens we are looking through. As Ann approaches this little girl she witnesses her capturing the ants because “we hafta kill them” (p. 11). Ann Pelo engages the child in eco-pedagogical practice of exploring new perspectives, and via a guided conversation lead by Ann the child is asked to tell the ants’ story. The child is able to adopt a radically different perspective. The student begins creating an entire story about the ant and their family. Shortly after creating this story about the ant family, on her own volition frees the insects and states, “Go home, ants! Go to your home. Go to your family” (Pelo 2009, p. 11).
One of the main tools of ecopedagogy rests in its ability to achieve radical shifts in perspectives. This is embedded in many of the concepts braided within it, be that eco-literacy, inter-being, or consciousness raising. All of them, in different ways, speak to such shifts. As does the place based perspective, which I will now build on a bit further.

To Love a Place(s): The Fourth Research Question

Kathleen Dean Moore writes that:

To love – a person and a place – means at least this:
1. To want to be near it, physically.
2. To want to know everything about it—its story, its moods, what it looks like by moonlight.
3. To rejoice in the fact of it.
4. To fear its loss, and grieve for its injuries.
5. To protect it—fiercely, mindlessly, futilely, and maybe tragically, but to be helpless to do otherwise.
6. To be transformed in its presence—lifted, lighter on your feet, transparent, open to everything beautiful and new.
7. To want to be joined with it, taken in by it, lost in it.
8. To want the best for it.
10. To love a person or a place is to take responsibility for its well-being. (Moore 2004).

The case studies of Ann Pelo illustrate the manners in which ecopedagogy can achieve the type of love that Moore has in mind, a love for ourselves, for our sense of place in the world, and from which we can expand that love to those around us and even the planet as a whole. This is a form of conscientization, it is a raising of the self beyond “naïve thinking” to a place where one is critically reflecting on their position within their eco-system. This eco-pedagogical consciousness is a falling in love with that interrelated network that we all exist within and are dependent on, we become responsible for the continued healthy existence of that phenomena. We protect what we love. Ecopedagogy seeks to foster a relational and reflective existence of human beings to their world, adding a new sense of beauty and way of interpreting our world. A consciousness which empowers us to be facilitators for change in how humans either chose to continue the necrophilic practice of
exploiting and destroying life, or to engage as educators in fostering a revolutionary discourse around biophilia, as humans become caretakers of life.

A final research question from this section emerges around place-based pedagogy:

Research Question Four: How does an eco-pedagogical curriculum foster participants concepts of place, space, and home?

Having explored the basic concepts embedded within ecopedagogy I will now pivot to the second main literature, that of agro-ecology (or as it is more commonly known among practitioners, permaculture), and explore the rise of this new agricultural literacy. I will show how this new form of agriculture is a design system that has potential as a non-formal adult education system, and as an alternative development theory (and is being used as both in parts of the world already). Additionally, in the later part of Chapter Two, I will demonstrate how this new agricultural paradigm of agro-ecology braids with improvement science.

Section Two: Agro-Ecology – The Rise of a New Agricultural Literacy

With the rise of modern agriculture and the “green revolution” – agricultural and technological innovations that began in the 1930s and reached a peak of application in the late 60s (Hazell 2009). Mass literacy campaigns had fairly radical roots to their origins. They were used to help with many of the socialist revolutions in Latin America, as well as with the Communist Revolutions in China (Abendroth 2009). Ulrike Hanemann speaks of such adult literacy as specifically integrating “holistic approaches” (p. 14) and that they are part of a “social practice” (Hanemann 2016, p. 14). However capitalist markets and human capital based societies also learned how to leverage such mass literacy campaigns towards their own purposes with education policy. One such set of examples was in how educational policies saw an increasing interest in adult mass literacy campaigns for functional forms of literacy
(as opposed to e.g. more socially aware forms of literacy) for the purpose of development 
(Sen 2000; Peet and Hartwick 2009). Freire himself was appointed to help implement such 
farmer field schools via mass literacy campaigns in Guinea Bissau following their 
independence, and was considered to have struck to most of the core critical components of 
the critical pedagogy he promoted in those nation-wide reforms (Chianca and Cecon 2017; 

Farmer field schools developed along this continuum. Some were more in the 
Freirean tradition. Others have come into existence with more explicit human capital 
approaches for a functional literacy aimed at technology transfer that would enable rural 
citizens to have access to the literatures of modern technology for the purpose of growing 
food, often for cash crops as a major percent of poor nations GDP (Davis et al. 2012). Even 
today, agriculture accounts for 29% of GDP in developing countries and for 65% of their jobs 
(Pye-Smith 2011). However the development goals of the green revolution remained largely 
ilusive, as such technologically driven agriculture has not generated wealth for most peasants 
(Larsen and Lilleør 2014). Despite increasing their capacity to grow cash crops, access to 
nutrition has not improved and the AIDS epidemic has made issues of starvation, access to 
health care, and access to basic calorie and nutrition needs even more complicated (Mukiibi 
2001; McCleary 2016). That being said, there were many elements that were successful in 
these projects, in spreading scientific literacy, increasing awareness of new technologies, and 
at least in the short term improved food yields24 (Larsen and Lilleør 2014; Boshier and 
Huang 2010). Adult literacy campaigns created popular literacy campaigns that transformed

---

24 At least temporarily – long term impacts globally for agri-business are rapidly shrinking, and many note that the gains in yields came at the cost of practices that will negatively impact future food production. To put it another way, the temporary increase that those growing up in the second half of the 20th century experienced and enjoyed, came by borrowing the inheritance of future generations capacities to provide for themselves in manners that are causing grave ecological dEmily Osloge. See for example Shiva 2004; Inter Governmental Panel on Climate Change 2018; UNCTAD 2013.
access to literature in country sides in nations with significantly less capital resources than economically developed western states (Boughton and Durnan 2014).

This dissertation seeks to partially update such studies by exploring the curricular claims of permaculture as a philosophical and pedagogical alternative non-formal educational curriculum that functions similarly to farmer field schools but with critical differences. This includes evaluations of the impacts of permacultures curricular impacts around:

- Ecoliteracy – with specific emphasis on biophilia and inter-being (RQ one)
- Critical theories emphasis on praxis and the ability to influence change (RQ two)
- The ability to unpack the linkages between environmental/social violence – a core component of ecopedagogy (RQ three)
- Influence conceptualization of place as a function of eco-literacy (RQ four)
- Foster democratic norms as a function of it being a more participatory and democratic approach to knowledge generation and power – a reflection of it’s braiding of critical theory, agriculture, and ecology (RQ five)
- Impact gendered dynamics within the villages – particularly those that interweave with agricultural aspects such as land ownership (RQ six)
- To what extent are materials/methods being used a reflection of appropriate critical theory approaches within a FFS (RQ seven)
- To what extent are the pilot programs a manifestation of a Networked Improvement Community and improvement science and creating collecting action (RQ eight)
- To what extent is adaptive leadership emergent as a consequence of the braiding of the concepts being implemented with this theory of leadership (RQ nine)
I will begin this next section by exploring some of the emerging literature on permaculture (which is still limited) around more of the eco-literacy components of permaculture, and then move to more of the curricular claims and braid in the critical theory components, gendered aspects, and lastly the improvement science.

**Permaculture Defined**

Emergent literature has indicated that permaculture can be a successful curriculum in addressing the health needs of orphans and vulnerable children (Conrad 2010). Conrad’s research supported permaculture claims that such agricultural practices lead to measurable improvements in health. In another similar piece of research McCleary observed the use of permaculture among First Nations in the Pacific Northwest to address nutrition/food needs and provide an alternative model to capitalist development theories (2016). The results indicated that this non-capital (low-input) based system could measurably impact nutrition needs. Studies in the efficacy of such approaches to address the kinds of Freirean critical literacy concerns are, to date, largely absent, though there are some preliminary researchers in this field with promising results (Balfour 2003; Jewkes et al. 2014).

---

25 As will be discussed in Section Six on Improvement Science, one of the key aspects that notes a part of this field which I am braiding in, is that there is an embrace of failure, which should be readily discussed. I am trying to avoid confirmation bias in my presentation of this literature here on agro-ecology, which is an emergent field. A state that I am “a believer” in the claims of the field based on the warrants and evidence I have both read about and seen myself in many divergent spaces, and been a practitioner of myself in several different landscapes and ecosystems. That being said, it seems like the field is failing to acknowledge possible failures. And this is problematic. The reason I say this isn’t because I think it is wrong, but rather, like in many (if not most) fields, we tend to publish the successes and not the failures (which improvement science specifically admonishes against). When I deliberately did searches such as “permaculture failures in the field” and other similar keyword searches I came up empty except for one interesting article that discussed basically the lack of transparency in publishing failure due to the kinds of problems I am discussing here – see (Feola and Nunes 2014).
The co-founder of permaculture, a citizen-scientist and farmer named Bill Mollison put it this way, “permaculture is about designing sustainable human settlements. It is a philosophy and an approach to land use which weaves together microclimate, annual and perennial plants, animals, soil, water management, and human needs into intricately connected, productive communities” (Mollison 1997). The key elements here are that permaculture (a combination of the words permanent and culture) is a design system meant to maximize resources and foster diversity while providing for human needs, it is however a bio-centric vision that values all life forms instead of being limited to the anthropocentric.

The figure below represents the hierarchical nesting of these values – there are three core ethics, self-care, earth-care, and fair share. These are then circled by twelve principles for design, typically an agricultural project but it has now been applied to urban development, neighborhood planning, economics, etc. (Holmgren 2002).
In defining permaculture, it is important to note that permaculture has been “little studied by the scientific community” (McCleary 2016, p. 79). Permaculture is a “multidisciplinary [curriculum], which shifts the view of traditional knowledge as being rudimentary and basic to one that recognizes its intricacies and complexities, while offering an alternative knowledge perspective and management of small-scale agricultural food production systems” (Ibid.). This interdisciplinary nature has often made it difficult to categorize and left it in between fields of study (Ibid.). This directly relates to some of the issues raised in Section Seven relates to wicked problems and fragmentation. Permaculture, by being a highly nested concept that seeks to defragment several different problems, is naturally a space for inter-professional thinking and action. Conrad and Misiaszek represented two of the first dissertations to begin bringing permaculture and ecopedagogy into the realm of academically interrogated spaces (Conrad 2014; G. W. Misiaszek 2011).

Figure 3 Permaculture Values
Taken from: http://www.kinshipurbanfarm.com/permaculture.html

In defining permaculture, it is important to note that permaculture has been “little studied by the scientific community” (McCleary 2016, p. 79). Permaculture is a “multidisciplinary [curriculum], which shifts the view of traditional knowledge as being rudimentary and basic to one that recognizes its intricacies and complexities, while offering an alternative knowledge perspective and management of small-scale agricultural food production systems” (Ibid.). This interdisciplinary nature has often made it difficult to categorize and left it in between fields of study (Ibid.). This directly relates to some of the issues raised in Section Seven relates to wicked problems and fragmentation. Permaculture, by being a highly nested concept that seeks to defragment several different problems, is naturally a space for inter-professional thinking and action. Conrad and Misiaszek represented two of the first dissertations to begin bringing permaculture and ecopedagogy into the realm of academically interrogated spaces (Conrad 2014; G. W. Misiaszek 2011).
As a design-system permaculture takes a much longer view of measurement/success as related to production than conventional systems. This doesn’t mean that there aren’t potential short term gains, there are. Ecosystems tend to be resilient, and soils can rejuvenate quickly, with signs of life (such as fungi) in dead systems from over-use of pesticide occurring in a single growing season in some cases (and a few to several years is not unusual). However, the point of permaculture as a design system, is to pay attention to much longer periods of time, in order to create long term rejuvenating systems that function for generations and multiple life-cycles. Sustainable agriculture, as defined by Ikerd is “a food production system that is capable of maintaining its productivity and usefulness to society indefinitely. Such systems…must be resource-conserving, socially supportive, commercially competitive, and environmentally sound” (Ikerd 1990 p. 4). While one might wonder if such long-term thinking is appropriate when dealing with starvation, with crisis in the present, we are already witnessing the shrinking of the gap between agri-business chemical based food production gap versus that of permaculture. While a generation ago the “green revolution” – agribusiness based forms of agriculture using big-ag techniques could claim a 180% stronger yield as compared to organic/permaculture models of agriculture (thus supporting a claim such as ‘we need this high input system with chemicals and technology in order to feed the world’), today that gap is as little as 5% (Seufert, Ramankutty, and A Foley 2012) and not typically more than 20% (Reganold and Wachter 2016) depending on the conditions, crop, and scale of what is being compared. This also doesn’t take into account

26 Geoff Lawton describes one situation “Greening the Desert” where they first experimented with permaculture in the East Bank of the Jordan Valley in an area that goes above 50 degrees C and talks about how they desalinated the soil in an amount of time and with an amount of water that was “impossible” according to the traditional agriculturists, and shortly thereafter the Jordanians called him in a panic “we’ve got a problem we have fungus growing in the soil!” because they had never seen fungus growing in soil (it’s a desert with 50 degrees C temperatures!) – they had created so much moisture with their techniques of water capture and recycling using mulching of dead material etc. they had brought the soil back to life in a few years in a way that no one thought was possible. Fungi, as extremely delicate organisms, are seen as a key indicator species for a healthy soil ecology. See the entire documentary here: https://youtu.be/2xcZS7arcgk

27 Meaning isn’t whatever system can boost the most food production right now the one we should use in policy?
that the gap is likely to move in favor of stronger yields by organic and permaculture techniques due to the soil degradation occurring by overuse of pesticides that are creating significant challenges for resilience for pest management and soil fertility and health (Ibid). Indeed, Reganold & Wachter note the other key components that should be considered when comparing organic and conventional farming which they lay out in the following figure:

![Figure 4: Sustainability in Conventional vs. Organic Farming](https://www.nature.com/articles/nplants2015221)

The flower petals and the labels represent different sustainability metrics that compare organic farming with conventional farming. They illustrate that organic systems can better balance the four areas of sustainability: production (orange), environment (blue), economics (red) and social wellbeing (green). Illustration: John Reganold and Jonathan Wachter https://www.nature.com/articles/nplants2015221

When coupled to the fact that big-ag methods of yielding this marginal higher yield of 5%-20% is done at the expense of poisoning the soil and creating a systemic problem for future generations to deal with, including toxic water supplies, it becomes exceedingly difficult to argue that this policy is a more logical approach. Reganold and Wachter add to this the other aspects of food policy such as social wellbeing, sustainability, and production factors in their review of decades of research in the conclusions of the visualized data displayed above, which clearly indicate the favorability of organics compared to conventional methods, again based on a review of decades of literature around the four key indicators for
food policy in this arena. It’s for exactly this reason, that within food policy circles, including
from major development organizations such as USAID and various branches of the UN there
is an increasing awareness that a radical shift in agricultural food policy and the political
ramifications this carries is appropriate (UNCTAD 2013; Conrad 2010; FAO 2011; Pye-
Smith 2011; Wegner and Zwart 2011; McCleary 2016). Organizations from the UN to FAO
and USAID have all begun endorsing such a revolution in how we grow food.

At the heart of the food policy debate is a question if agriculture is best-practiced as a
system with high levels of external input or low levels of external input. The “conventional
farming methods” of agribusiness use high external inputs, such as pesticides and fertilizer.
Permaculture resides firmly in the low external input side of this debate. The debate centers
not only around what is most economical, but what makes most sense when considering
compounding problems such as environmental (and particularly soil) degradation, climate
change, and hunger (Rosegrant et al. 2014; Wegner and Zwart 2011; Lyson 2002).28 A
system designed to maximize food and nutritional yields in a low-input system is worthy of
evaluation and consideration for implementation in resource-poor communities. This is
particularly true as such practices help protect the natural resources they do have, such as
healthy soil (FAO 2011; UNCTAD 2013; Milder, Majanen, and Scherr 2011; Altieri and
Toledo 2011). Given the manners that high-external input practices of farming have
contributed to soil degradation and climate change, many also point out that whatever the
gains of conventional agriculture in the present, those need to be weighed against its adverse

---

28 This also includes the emerging debate about the debt-based economics of high external input agricultural
practices in cash-poor environments such as India, where there is a contested debate that such practices are
fueling mass suicides among poor farmers in the world. Such farmers once they take on the debt necessary to
engage in high-external input systems often find themselves unable to maintain the costs that are now required
to continue to produce food, leading to poverty, hunger, and oftentimes suicide (Gruère and Sengupta 2011;
impact on the ability to produce food in the future and the attached costs (UNCTAD 2013; Nellmann et al. 2009; Pye-Smith 2011).

Within this debate, permaculture is one of the leading examples of a low-external input system. Permaculture is an applied version of agroecology (Conrad 2014). Agroecology is the application of ecology to agriculture (Wezel et al. 2009) by mimicking natural systems and interrelationships among organisms (Altieri 2002). The permaculture design system created by Holmgren and Mollison has expanded on these concepts with concrete ways to operationalize such ideas when applied to agriculture and human settlement (Holmgren 2002; Mollison 1997).

Investigating the claims of permaculture as a curriculum and technology are merited in part simply on the strength of the critiques of chemical-based farming practices coupled with food insecurity. It has been widely noted that the underfunding of research into these areas has exacerbated the speed with which alternative practices are (not) being considered for agricultural and educational policy to the detriment of many peoples and ecosystems (WWF 2015; Ferreira 2012). Veteto and Lockyer likewise note that:

The academic response to Mollison and Holmgren’s work was mixed, but largely negative; the disciplinary specialization of the academy was not prepared for the holistic approach that they offered, even in the face of the emerging and increasingly acknowledged socio-environmental crisis. The academic world would have to wait some 20 years before interdisciplinary work became a dominant research paradigm—permaculture was way ahead of its time. Mollison’s words again: “The professional community was outraged, because we were combining architecture with biology, agriculture with forestry, and forestry with animal husbandry, so that almost everybody who considered themselves to be a specialist felt a bit offended” (Mollison 1991:preface). Similarly, Holmgren notes that “permaculture was conceived within academia. Many who are involved in largescale agriculture and land use policy saw it as theoretical, utopian and impractical because it was difficult to apply within the prevailing social, market and policy environment” (Holmgren 2002: xxii). Although permaculture has been taken seriously by some academics, resulting in occasional sporadic publications over the years (e.g., Jungt 1985; Kennedy 1991; Strange 1984a, b), it has largely been ignored. This is particularly the case in anthropology, where little or no literature exists (Veteto and Lockyer 2008, p. 49).
Thus academic attention within educational and policy spaces is an appropriate and necessary step. There are two aspects to this, one is to further evaluate the claims of permaculture around production, yields, and sustainability, although this has begun to begun to be done (see (Reganold and Wachter 2016 for example, which is in part a furthering of the doctoral work by Wacther). The second, which is where this dissertation seeks to push forward, is where such claims intersect with the merits of permaculture as a curricular program in FFS or NFE policy, and how they can be intelligently implemented and evaluated. It is this last part where improvement science as an evaluative lens comes in (Section Six).

Permaculture Curriculum: What can I demand of this land? A Fifth Research Question

In one of the central texts for PDC courses, Bill Mollison’s “Permaculture Two”, several different types of claims are made. Mollison opens his text stating that, “I regard permanent agriculture as a valid, safe, and sustainable complete energy system” (Mollison 1979, p. 1) already indicating the interdisciplinary nature of the curriculum he has in mind. He notes that in part dominant languages such as English are conceptually weak with the language to address the patterns of nature permaculture seeks to emulate (Ibid. p. 3). Mollison understands that his project reflects more deeply a way of thinking and being, a way of change, “(this text) then is not about design, gardening, livestock (agriculture) per se but as elements in a system intended to serve people, and the ends of good ecology” (Mollison 1979, p. 2). Reflecting this philosophical prism with which permaculture approaches agriculture, human settlement and ecology he asks, “What can I demand of this land to do? Or – What does this land have to give me? – the first leads to a forcible rape of land by machinery, and the second to a sustained ecology…It is war or peace” (Ibid.). It is based on such a philosophical prism and social change function that permaculture adopts “a low-energy system of agriculture” (Ibid.) and recommends practices that do not till or turnover
soil, nor use any chemicals, pesticides or fertilizers. So the main categories of permaculture curricular claims seem to center around two distinct spheres: 1. Claims that their diverse methods at biomimicry and design will result in higher long term and sustainable yields that maintain diversity, stable ecosystem, and can sustain human needs and that 2. Such a food system would result in social and economic changes leading to more democratic structures of power. As Mollison notes, “the further we depart from communal permanence, the greater the risk of tyranny, feudalism, and revolution and the more work for less yield” (Ibid, p. 4). Permaculture curricular claims are ecological, agricultural, sociological, and political.

This political component of permaculture, and the way in which it braids together other aspects (like the ecological, agricultural, sociological, and economic) have become more pronounced and picked up lately by researchers. Pittaway notes for example how democracy at its core “is an open system, while capitalism is a gated one” yet most of our democracies are being run as democratic capitalist societies (Pittaway 2018, p. 4). Pittaway notes that this core of capitalism embedded within democracies creates a resistance to substantial change to our political economies because the capitalist economies are based on a growth model that created our ecological crisis and is ill equipped to address it. However, “the ecological crisis, which has arisen in part from unrestrained economic growth…means acknowledging democratic capitalism’s incapacity to deal with some of humanity’s current challenges, such as the ecological crisis” (Ibid.). That is our destructive behaviors are forcing a confrontation with the systems creating them, and thus are beginning to open the door to considerations of alternative development possibilities, both economic and political (Sanford 2017; Millner 2017).

Acknowledging this problem means acknowledging democratic capitalism’s incapacity to deal with some of humanity’s current challenges, such as the ecological crisis. A pressing question arises: what does one do? Arguably, if ecological decline is to be slowed or averted, choices must be made that result in ways of thinking and ways of living notably different from those systematized under democratic capitalism.
The need for choices incommensurable with democratic capitalism is a sign that a philosophical situation has arisen, because, as explained by Alain Badiou, part of the role of philosophy is to confront incommensurability. In positioning democratic capitalism (and its implications for ecology) against incommensurable alternatives, a full philosophical situation arises. Permaculture is an example of an arena offering such alternatives, and an outline of an implementation of permaculture principles is provided in order to illustrate what a potential remedial candidate entails. (Pittaway 2018, p. 5)

It is thus the social complexity, and the attempts of permaculture to be more than just a technical literacy around agriculture, that is of overlapping interest to the other research questions and concepts of this dissertation. Some FFS have begun utilizing permaculture curriculum, and adopting more ecopedagogical standpoints, which is how I will evaluate ecopedagogy – via a permaculture curricular implementation at an FFS site in Western Kenya. Such complexity via the wicked problem concept will be dealt with more fully in Section Six, but even within the permaculture framework, we see in Mollison’s and Pittaway’s work the importance of unpacking these hidden connections (that critical theory and ecopedagogy also begs of us to engage in). Permaculture is attentive to the political ramifications it carries with it, as an alternative theory for how power dynamics can function, how resources can be allocated, and how governance can operate. The degree to which an FFS using permaculture takes on the political as part of such a praxis for encouraging collective action will be intriguing to investigate. Thus a fifth research question emerges:

*Research Question Five: In what manners does permaculture as the basis for a curriculum for an FFS foster democratic social norms and cultivate political action?*

Farmer field schools (FFS) offer one of the most globally successful examples of an agro-ecology curriculum that has been tested out in many different contexts. Not all FFS programs could be considered to fall within the framework of ecopedagogy or agro-ecology. This harks back to the earlier discussion about the continuum of NFE and adult literacy, as well as mass literacy campaigns (which were largely NFE and adult literacy). Some of these
were quite critically theory oriented, while others were more pragmatic and technically focused. If an FFS is more technically focused, and based purely on a desire to transmit such kinds of technical literacy, it is quite unlikely to be falling within an eco-pedagogical framework. On the other hand, those that are more embracing of traditional critical theory roots as part of adult literacy, are quite likely to have aspects of ecopedagogy within them. This is further explored in Section Three in the historical roots of FFS. Increasingly in Sub Saharan Africa (SSA), and particularly in both West and East Africa, more and more FFS are adopting varying degrees of a critical approach that incorporates both critical-theory/literacy (including eco-literacy) and agro-ecology. This means there are increasingly programs that can (and largely to date have not yet been) studied to determine some of the impacts such an approach actually has. The specific site where I will be conducting my research is an example of both an FFS that also incorporates a permaculture curriculum and (at least some aspects) of ecopedagogy. Such overlap with FFS in SSA are an increasingly common trend. In this next section I will more fully explore the roots and evolution of the FFS.

Section Three: Farmer Field Schools

Mass literacy campaigns and NFE programs were abundant throughout the 1950 and 1970s. However, in the 1980s something called "integrated pest management" (IPM) began to emerge, which was a specific kind of NFE for adult literacy, aimed at creating farmer field schools (FFS) that would teach farmers how to farm in less chemically dependent ways as the cost to soil, foods, and the human body and ecosystem was becoming more apparent. Farmer field schools (FFS) began in Indonesia in 1989 under the more commonly referenced term of "Integrated Pest Management" (IPM) systems. Since then IPM have become a standard

---

29 See for example https://slfnd.org in Sierra Leone with an explicit critical literacy approach tied to their permaculture-eco resilience FFS education programming
practice for nearly all agricultural production systems. The FFS was created by the FAO due to an infestation of plant hoppers in rice and a need to combat the infestation without simply dousing the food supply in poisons common in pesticides (Berg and Jiggins 2007; Fliert and Braun 2002). The FFS was considered highly effective in Asia in addressing the overuse of pesticides and the preservation of soils, and led to this non-formal educational system taking off in the 1990s throughout much of Asia as a result (Chambers 1997).

This non-formal educational program focused on adult literacy with a narrower focus on literacy that was aimed at the transfer of technologies. It was thought that such functional literacy would lead to an improvement of agricultural yields and management of natural resources (Chambers 1997). This spread of FFS and the IPM model of agriculture first moved into Africa in 1995, with Kenya being the first African nation to begin testing FFS (Mweri 2005). By 2007 over 3000 FFS had been established in Sub Saharan Africa (SSA), with over 2000 FFS being established in 23 districts of Kenya alone (Mweri 2005; Fliert and Braun 2002; Palis 2006; Berg and Jiggins 2007; Duveskog, Friis-Hansen, and Taylor 2011; Friis-Hansen, Duveskog, and Taylor 2012; Bunyatta et al. 2006). Despite the resounding success of FFS in Asia and the rapid expansion of these non-formal education programs in Africa, Sub Saharan Africa has presented unique challenges to a successful implementation of this literacy program which I explore in the next sub-section.

Why FFS in SSA Have Faced Unique Challenges:

While FFS has had significant successes in SSA, it has also faced unique challenges in its transfer of application from Asia that were not anticipated. A primary reason for this is that as the purpose of FFS was largely focused on a literacy that would enable a transfer of technologies there were certain ecological conditions and assumptions that were being made
that when applied to SSA did not hold. For example, the FFS adopted a rather universalizing approach with a curriculum that was viewed as scalable and applicable without much modification from Asia to SSA. The problem was seen as one of knowledge management: If the right key could be found for how to unlock the solution to this problem (e.g. manage pesticide loads) then this could unlock the solution to the problem in any context. It was not place-based, it was not context sensitive, and it did not consider critical literacy and co-creation of knowledge as a process integral to the knowledge production necessary for successful implementation. All characteristics that will be explored in detail in Section Six as this debate relates directly to methodologies within IS. While this knowledge management approach worked well in Asia due to the fact that monoculture was common and it was practiced on enormous tracts of land where vast and stable ecosystems are fairly consistent across large geographies for hundreds of kilometers (Najjar, Spaling, and Sinclair 2013). In SSA ecosystems can change rapidly across short distances, making this approach ill-suited to the African eco-scape (Berg and Jiggins 2007; Deugd, Röling, and Smaling 1998; R. Percy 1999; Rachel Percy 1999; Pretty 2002). Coupled with such rapidly changing microclimates are the additional challenges of soil which has been farmed for 8,000 years, resulting in depleted soils that are often highly eroded. Additional challenges are presented by the subdivision of land into ever smaller parcels as part of colonial laws designed to weaken Indigenous and tribal power combined with patriarchal rule and the often large distances to markets for villagers (Defoer 2002; Tittonell et al. 2005; 2006). All these factors made African agriculture a unique challenge, and an example of a wicked problem (Section Six). On top of all this were the disruptions to ecosystems due to climate change and mismanagement of sources – particularly soil and water (Berg and Jiggins 2007; Defoer 2002; R. Percy 1999; Rockstrom 2010; Rolling and Wagemakers 1998).
As Najjar, Spaling, Sinclair and others note, this misapplication of FFS to the SSA context is based largely on a public policy focus on monoculture cash crops which has perpetuated a subsistence agriculture and is a public policy that perpetuates human suffering (Najjar, Spaling, and Sinclair 2013). While recognizing that FFS has generally improved food security and longer term ecological health in SSA, albeit not as much as many scholars think is possible with appropriate modifications (Duveskog 2006). For such historical reasons some researchers are increasingly calling on a more critical literacy approach to FFS in Sub Saharan Africa and one that will also use more democratic agricultural practices based on collaborative models such as agro-ecology/permaculture (Conrad 2014; 2010; FAO 2011; WWF 2015). This again calls to mind the critiques of Misiaszek of what development means, whose development, who benefits, who does not, and why? (G. W. Misiaszek 2020)

So often there are manifest solutions and techniques that are not implemented in policy – and to interpret such dichotomies it is necessary to unpack the tangled web of ecological and social degradations and how they are nested within violent economic and political histories of capitalism and slavery or colonialism (Greg W. Misiaszek and Torres 2018; Kahn 2010; Greg W. Misiaszek 2012).

With this in mind I have been seeking a critical literacy approach with a more democratic design both in content (agro-ecology) as well as in methodology. A specific methodology that some of these scholars in East African eco-literacy are citing is participatory research and extension (PR&E), which I will briefly explore in the following sub-section. In Section Six I will demonstrate how IS fits such a model and how the specific evaluative methodologies I can use to explore methods of IS incorporate many of these ideas.

PR&E as A Critical Literacy Approach to the Study of FFS in Africa
Participatory Research and Extension (PR&E) offer an approach to research that focuses on collaborative learning and social action/change (Percy 2005). Instead of being a top-down approach with researchers being viewed as the experts with all the knowledge, this approach seeks to challenge such power dynamics and relationships and empower equally voices from farmers, scientists, researchers, and extension agents. This dynamic approach recognizes the knowledge, observations, and experiences that all parties offer and seeks to facilitate the ability for them to learn from one another. This method builds on the Freirean models of pedagogy and critical literacy (Section One), a dialogic and dynamic model that values the knowledge of everyone involved. This idea, that locals can be the most meaningful experts on local problems, and that there exists wisdom within crowds, will be greatly expanded upon in Section Six within Improvement Science.\textsuperscript{30}

Within PR&E there are specific analytic tools such as The Agroecosystem Analysis (AESA) which offer an interdisciplinary approach where ecology, sociology, politics, and economics are all considered – an historically constituted approach in the Freirean tradition (Section One), instead of viewing knowledge as disconnected from its context. When dealing with all the unique African agricultural problems mentioned earlier (wicked problems, Section Seven), such a historically constituted approach to agricultural research where voice and value are given again to the local inhabitants, farmers, and elders become even more valuable (Cornwall, Harrison, and Whitehead 2007).

\textsuperscript{30} There is a related idea in improvement science – best highlighted perhaps in the article "Making Research Relevant: If It Is an Evidence-Based Practice, Where’s the Practice-Based Evidence?" by (Green 2008). The basic idea here – which is quite similar to the stance taken in much of positive deviance models – is that while evidence based practice (research driven) is valuable, too often it ignores and undervalues the input and importance of practice based evidence (wisdom). That is to say – community input. It is for this reason that more equitable voice and power by – in this case – farmers – is equal to (to reduce it to a crude binary) "good." It improves the rigor and validity of the data – research driven should consider the validity and importance of both classical research and practice based. In this case, the practice based (farmers) is also research driven, as they are conducting and generating research based data as well.
An example of how this model can take into the political and economic dimensions includes a focus on markets and farmers’ political influence in agriculture (Berg and Jiggins 2007; Duveskog 2006; Duveskog, Friis-Hansen, and Taylor 2011; Fliert and Braun 2002). Such political and economic layers to an agricultural study involve gendered inputs and outcomes. A lack of male involvement in agricultural labor, along with excessive male alcohol consumption, and a lack of female access to land are seen as three of the critical problems facing East African agriculture – all gendered issues (Najjar, Spaling, and Sinclair 2013; Mweri 2005; UN Women 2018; 2015; Global Education Monitoring Report 2016).

Social complexity is built into such issues (Section Seven). Challenging such norms, laws and practices requires processes that facilitate change via adaptive leadership (Section Seven) (Conklin 2005a; Heifetz and Laurie 1997). Improvement Science offers a paradigm within which to use such methodologies that value and empower partnering local experts about local social and political complexity with external experts who can bring to bear instruments, tools, and more globalized knowledge. Working together these inter-professional participatory groups become able to learn how to modify what has worked elsewhere in manners that will allow it to work locally, coupled with the power of the process of discovery itself and how this changes fidelity of implementation (Section Seven).

In my view, classic FFS that narrowly focus on functional literacy and the transfer of technology, will never address and vocalize such issues, making it all the more difficult to accurately describe the problems and then build consensus in farming communities on how to address them. Indeed, rushing to a solution without first correctly identifying what the problem is will be referred to as “solutionitis” and is seen as one of the most common reasons that complicated problems remain unsolved in today’s world (Section Seven). Ahistorical approaches to agricultural literacy have faced significant obstacles to success as a result,
pointing again to why a more serious consideration of Freirean approaches (Section One) that are less based on a utilitarian literacy and instead tackle the embedded and interdisciplinary nature of these problems makes sense. Considering that many of the core problems of a successful agricultural policy in SSA are gendered problems, I now turn to a description of gendered issues in agriculture. Some of the specific ways this manifests within Asumbi Village in Kenya will be picked up when I go over the settings in Chapter Three as well. The manifest overlaps introduced by scholars of FFS about PR&E will be returned to in detail in Section Seven within the evaluative lens of IS.

Section Four: Women’s Rights & Gendered Issues in Agriculture and FFS

The second half of the 20th century saw a significant focus and increase on women’s rights. Much of this came via constitutional reforms that enshrined greater equality and protections for women (Vaughan 2016; UN Women 2015; Global Education Monitoring Report 2016). The concept of equality between men and women was “set out in the Universal Declaration of Human Rights in 1948” (Vaughan 2016, p. 2). International commitments by the worlds governments have reaffirmed these goals in the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW) in 1979, the Beijing Platform for Action in 1995, UN Security Council Resolution 1325 in 2000, and most recently in the Sustainable Development Goal #5 which launched in 2015 (Ibid.).

Among the gains observed in this past half century of such commitments include:

- 143 nations whose constitutions enshrine gender equality
- 132 nations have equalized gender marriage ages to 18 and up
- 119 have laws on domestic violence
• 125 have laws to prevent sexual harassment in the workplace (UN Women 2015, p. 28-32)

While this is all encouraging, it is striking that with a super majority of nations having explicit laws to create equality between genders, oppression and mistreatment of women still occurs in staggering amounts and universally across all nations. I am reminded of Lisa Kristine’s work on slavery, a photojournalist whose TED talk on this issue has been viewed nearly 3 million times, wrote in The Atlantic, “it is illegal everywhere, but it exists all over the world” (Kristine 2012). What Kristine has pointed out, is that in such situations, where something that exists globally, despite universal laws outlawing it, requires more than just a top down policy approach through legislation to change its existence. It’s cultural. It’s part of a wicked problem, it’s embedded in social structures, in power dynamics, in the ways we produce and consume, and how we think about our behaviors related to such actions. This is very parallel in situation to the ubiquitous existence of violence against women across nations (Gilligan 1997), despite the reasonably progressive march we’ve seen over the past hundred years to outlaw many of the worst forms of this violence (with much progress still to be made without question, and blowbacks against this happening constantly – see Faludi 2006). To tackle such wicked problems, as is noted in Section Six, they are inherently socially complex, they require addressing culture, which can’t be done only by means of legislation from above.\(^{31}\) This need for a theory-action bridge when engaging in such work is taken up explicitly by Stanlie James in Theorizing Black Feminisms: the visionary pragmatism of black women when she wrote that such work is a “form of agency that provides them with

---

\(^{31}\) If that were true, then Brown v. Board of education would have eradicated racism in America along with Supreme Court decisions like Loving vs. Virginia (which outlawed laws prohibiting interracial marriage, a law only struck down in 1967?). Laws can change policy, which certainly can impact culture, especially over time, but the idea that such a straightforward approach to policy, change this law, change the culture, and thereby tame this wicked problem, strikes me as very naïve and historically misguided.
opportunities to learn, think imagine, judge, listen, speak, write and act (Stimson, 1989) which transforms not only the individual (from victim to activist, for example) but the community and the society as well” (Busia and James 1993, p. 2).

Women continue to represent the bulk of informal economies, which are less regulated and subjected to laws (UN Women 2015; Perrons 2014). When it comes to leadership the numbers are even more disheartening, with women representing 20% of global legislatures, 19% of heads of state, 18% of ministers (and those mostly confined to social issues as opposed to positions perceived as more powerful like economy or defense), and boards of corporations (with nearly all nations having less than 25% of their boards comprised of women) (UN Statistics Division 2015, p. 136). Women are absent from the seats of power where many of the policies are being shaped and implemented that continue to disproportionately disadvantage them. In the words of the GEM Report Gender Review – the results I see, and the widening gaps of women’s ability to gain equality based on class are “simply appalling” (Global Education Monitoring Report 2016, p. 5). This of course points directly to the importance of programs, educational and otherwise, that have the promise of promoting female leadership at all levels of society and addressing those who are (in danger of) being left behind.

The dangers of not having women empowered are manifest everywhere, perhaps nowhere more so then in the widespread violence women continue to face. Women continue to suffer from female genital mutilation, with more than 200 million girls and women having been subjugated to this (UNICEF 2016). The villages in which we are working do not suffer from this problem of FGM, however the problem is known to occur in other tribes that are “nearby” (within an hour’s distance), according the leaders from their villages. Gender based violence continues to plague our societies, with 1/3 of women globally having experienced sexual or physical violence and less than 40% of those victims ever seeking help (Parkes and
Unterhalter 2015; UN Statistics Division 2015). While suffering these indignities women continue to represent more than 2.5-3x the unpaid labor of economies as compared to men, and are paid less than men for the same work when they are formally employed (Chisamya et al. 2012; Nopo, Daza, and Ramos 2011; Posel and Casale 2014; UN Women 2015; World Bank 2012; UNESCO 2008). All these disadvantages further compound female leadership, as their higher average labor per day also ensures they have less leisure time to assemble, discuss political issues, and organize for change.

Addressing the Systemic in Violence Against Women: A need for critical literacy

The UN Women’s Report of 2015 called for three foci when seeking to address these historical oppressions of women: “1. Redressing women’s socio-economic disadvantage 2. Addressing stereotyping and violence and 3. Strengthening agency, voice, and participation” (Vaughan 2016, p. 4). Importantly this begins to point to pitfalls of oversimplification of causality in policies seeking gender equality. For example, women’s participation in education has not directly led to female empowerment. For the three reasons touched on above, “the relationship between education and empowerment is not always straightforward” (Vaughan 2016, p. 7). This is often the case because educational gender parity was viewed as the primary goal, ignoring that ongoing social reproduction of gender stereotypes and inequality can be maintained via education (Hickel 2014; Chisamya et al. 2012), depending on the texts being used and the teachers approach. Research has already revealed that education programming that includes critical reflection on gender norms can help break down these stereotypes and empower girls/women to make choices outside of traditional limits and increase their socio-political power (Achyut et al. 2011; Balfour 2003; Murphy-Graham 2009; Marphatia and Moussie 2013; Ralfe 2009). This included an ability for women to negotiate more equitable responsibilities in the home with their male counterparts.
Worth taking note, is that many of the findings above in the literature about women's roles in education are within formal education settings. I am investigating a non-formal education program, so it is an open question of the degree to which some of this may entirely transfer. There are reasons to believe it may not. In this NFE context I will be working with people who know one another well, and who are largely dependent on one another to some extent. They function in a local government where everyone gets voice and an opportunity to speak at local political meetings, regardless of gender. Given that the focus of the content is ecopedagogical, and that the women are doing much of the labor, it could well be that the literatures above that cite the high degree of reproduction within education that perpetuates gendered norms and violence against woman may not be true in this NFE/FFS setting. This very possibility is linked to the more generic need for education to include socio-political elements and to provide the historical contexts (Section One – Freirean literacy) for current conditions to actually empower learners to enact change in such power dynamics (praxis). As Vaughn notes, “women’s agency, decision making and ability to negotiate within the household are not automatically increased when girls and women have more access to education, but if the content includes an empowering transformatory approach then it is more likely to do so” (Vaughan 2016, p. 17). It is important to note and counterbalance this focus on the victims of oppression’s ability to raise themselves up through liberatory practices – thus perpetuating a narrative that individuals have the power to alter their own situation absent systemic change and collective action as opposed to challenging wider systems (Sen 2000), with that of policies and actions that hold accountable the institutions and structures that have created and enabled these systems of oppression to exist and continue in the first place (Hickel 2014; Darkwah 2010). Again there is research demonstrating that when such wider historical-political contexts to women’s oppressions are examined in educational spaces that there can be significant gains in women for reducing intimate partner violence,
more equitable earnings, and more equitable attitudes about gender (Jewkes et al. 2014). The value and importance of women having more voice and confidence in their own power to negotiate with men can have many tangential destructive or constructive implications. For example, researchers in South Africa have observed how male aggression and patriarchy have made it uncomfortable and difficult for women to negotiate with their male sexual partners the use of condoms to protect against HIV (Campbell and MacPhail 2002). For these reasons the UN has already recognized that further research and data collection based on classroom observation is needed to determine how such critical literacy policies can be scaled and used to implement MDG 5 (Vaughan 2016). Knowledge management (HIV is a virus, use condoms to prevent the spread of disease) is not working. It tries to make a complex social issue a tame and simple problem, reducing it to a knowledge management approach (Section Six). This is exactly the reason that the methodologies and paradigm of IS are so promising.

Does Ecopedagogy Impact Female Empowerment? Research Question Six

Further compounding this problem of making a simple knowledge management link between education and empowerment is the large disparity in technical vocational education and training (TVET) between men and women. Even though women represent a super majority of such labor, they also represent only a minority of those who have the opportunity to participate in such learning programs (UNESCO 2012; Kabeer 2009). In many parts of SSA this trend of participation within NFE programs has been reversed, which speaks in part to the success of FFS in SSA. Exploring if this trend reversal of female access to TVET in SSA has led to female empowerment in these communities is a logical next step for this research to take, which is a part of this dissertation study. Additionally researchers have expressed interest in determining if such access to TVET is translating to economic gains or
increase in financial independence, which it is assumed would also correlate with a rise in political voice and power (Vaughan 2016). This TVET programs are largely for upper secondary students, so adapting this logic and extending this kind of educational programming for adult literacy and NFE as well would be innovative for policy as a means of also disrupting the current system and stimulating development, entrepreneurship, and resilience in the system.

*Research Question Six: In what manners does exposure to this curriculum impact gender dynamics within the village?*

In many of these nations laws continue to directly benefit men over women in inheritance law, and even where such laws have been removed, cultural norms continue to favor such patriarchal inheritance-based systems. Women typically have access via husbands; in some nations laws have changed to allow daughters and wives to inherit (land? Or property?), but this remains uncommon in SSA. In Kenya divorced/widowed and unmarried women can only access land through male elders in their village, and such access even when granted is typically to land that is inferior in quality and under temporary temporal conditions (World Bank 2012; ILO 2016). This temporary access to land with no permanent guarantee of ownership for women, who do most of the farming, removes incentives for most agro-ecology/permaculture practices that require long term investments of time and labor – a rootedness to land (Section One & Two). Having women as a majority of the farmers but with less incentives for sustainable design/implementation for agriculture is compacting problems of climate change in agriculture (Najjar, Spaling, and Sinclair 2013; Marphatia and Moussie 2013; UN Women 2015; 2018).

Women’s participation in FFS can directly address many of the SDGs and improve the power that these women yield, including an increase in livelihood and political roles in their
communities (Najjar, Spaling, and Sinclair 2013). Unfortunately, like in many gendered studies, the initial measurements often focused on what was easier, not more valuable, to measure, such as parity of participation rather than actual changes in power dynamics (Hickel 2014). In the case of FFS this has often meant a focus on if women were learning how to use new technologies and implementing them in their agricultural practice (knowledge management – Section Six). This avoids dealing with the more systemic issues that women’s literacy through FFS could address, such as their inability to gain access to land ownership, or the lack of a strong political voice/power in determining labor laws and economics of production (Aliber and Walker 2006; Budlender and Alma 2011; Francis and Amuyunzu-Nyamongo 2005; C. L. Miller et al. 2010; Yngstrom 2002). The critical literacy FFS programs presumably are engaging in such work, but studies on these non-formal education programs remain minimal (Due, Magayane, and Temu 1997; R. Percy 1999). The potential contributions that a critical literacy ecopedagogy curriculum delivered via FFS using NFE could have for women centered learning outcomes remains unclear as it has been under investigated (Duveskog, Friis-Hansen, and Taylor 2011; Fliert and Braun 2002).

Some studies indicate that participation by men in FFS leads to an improvement of their treatment of wives at home, as measured by a decreased work load for the women (which when including unpaid labor tended to be 2-3x that of their male counterparts), more shared labor by the men, and more respect and political voice in the home for the women (Friis-Hansen, Duveskog, and Taylor 2012). Beyond an increase in male willingness to share in agricultural labor after FFS, in Kenya there was also a willingness seen to plant specific crops that previously were stereotyped as “female work” or viewed as culturally shameful for a man to plant (Najjar, Spaling, and Sinclair 2013). The flip side of this has also been observed, -- namely, when women participate in FFS, but their husbands do not, then the women are often impeded in their ability to implement the new techniques they have learned about. This
points to the importance of including men in the work of female empowerment (UN Women 2018). This speaks directly to the political dimensions embedded within this educational program, and points to the danger in FFS ignoring the politically gendered leadership issues intertwined with the agricultural/literacy goals of FFS. Such findings also sit in tension with other observations noted by researchers that women who participated in FFS were more likely to engage in public speaking (Duveskog, Friis-Hansen, and Taylor 2011; Friis-Hansen, Duveskog, and Taylor 2012) yet this clearly doesn’t necessarily translate into political power in the family decision making. There also remain differences for the values of leadership observed by gender when exposed to FFS, for example men tended to prioritize political issues that were more systemic, such as solving local hunger and improving women’s contribution to agricultural labor, whereas women tended to focus on self-sustainability for the family, but didn’t typically engage in community or regional level political leadership to enable such changes (Duveskog, Friis-Hansen, and Taylor 2011). Scholars speculate this may simply be as a function of the higher work load women have compared to men (due to their doing nearly all the unpaid informal labor), resulting in less comparative leisure time to engage in such political work (Najjar, Spaling, and Sinclair 2013; Marphatia and Moussie 2013; UN Statistics Division 2015).

Despite any gains FFS has offered, there remain significant gaps when focused on outcomes such as women gaining equal access to land, political power, and incomes (Njoroge 2004). As access to land was a pre-requisite to participation for many FFS, many women are in fact facing barriers to participate in FFS, especially the most marginalized and poorest among them. A question this dissertation can help potentially illuminate is can critical literacy approaches applied to NFE within FFS shift power dynamics around gender and politics, for example, attitudes toward land ownership and stewardship? Considerations around collective action, which will be examined more in Section Six, and how this relates to
IS, will begin to demonstrate some of the ways these threads create a cloth that may shed light on this.

Section Five: Gender and Critical Literacy

This dissertation is addressing particular gaps, specifically as it relates to agro-ecologies competence to manifest as a legitimate example of a critical literacy curricular approach within FFS. Given this, an additional layer that requires attention is what, if any, impacts such an approach has on gendered issues. Accordingly, it is worth spending some time reviewing some of the literature on critical literacy and gender, which is what I will lay out in this sixth section.

Critical literacy, which has also often been called emancipatory discourse (Janks and Ivanic 1992), is based on the idea that by constructing such coding, and then learning how to deconstruct it, would enable members to more critically consider the positions taken vis-à-vis power structures and culturally taught stereotypes about the plethora of social issues that are often defined by inequity: sexuality, gender, race, class, culture, disability, religion and so forth. The roots of this idea go back to Dewey (1916) and a generation later were emboldened with the work of Freire (1970b) both of whom left schools of thought and significant impacts on public policy across the world in critical literacy based curricula. Jank’s summarizes the purpose of critical literacy when she wrote, “critical literacy education based on sociocultural theory of language, is particularly concerned with teaching learners to understand and manage the relationship between language and power” (2000, p. 176) and concludes this idea noting “the shared goal of all critical literacy work is equity and social justice” (Ibid, p. 179).

The notion that critical literacy programs can be used to “moderate or alter behavior” based on gender stereotypes and various oppressions has been previously studied (Ralfe
2009, p. 305) with contested results. Part of the logic for hypothesizing that critical literacy approaches can impact stereotyped thinking emerges from the research indicating that stereotyped thinking and forms of oppression are perpetuated as conceptual structures through spoken language and the written word (Eckert and McConnell-Ginet 2003; Lakoff 1990; Tannen 1990). The specific ways that language have maintained gender norms and power dynamics has also been studied (Brice-Heath 1983; Corson 1993) with the important insight that it is through education (Swann 1992) and the teaching of young minds that such mythologies are perpetuated, and that the colonization of mind that occurs – how we are taught to think of constructs like gender at a young age – persist into adulthood (Corson 1993, p. 139).

There has been a contested debate about the need for basic literacy in order to engage in critical literacy. For more written based approaches this certainly makes sense, as students who are struggling to read/write will have a difficult, and according to some, an impossible time coding/decoding the text and written word as required by critical literacy (Hall 1998; Macken-Horarik 1998). The logic behind this approach is in part based on a definition of literacy as comprised of four core elements – the ability to:

- Be code-breakers
- Participate in creating text
- Comprehend text
- Analyze text (Luke and Freebody 1997)

By its very definition such an approach to literacy is heavily reliant on the written word and the ability to code/decode text, which then requires that critical literacy be built on the years and years of learning required to master such basic literacy skills (Ralph). From such approaches emerges Halls’ declaration that “basic literacy enables critical literacy” (1998, p. 84).
190) or from Ralfe that “without functional literacy it is simply not possible for learners to (engage in critical literacy)” (2009, p. 307). The logic is that when students are limited to reading at “frustration levels”\textsuperscript{32} they are neither capable of constructing, nor deconstructing arguments from written text, making critical literacy out of reach.

**A User Centered Approach to Literacy: Research Question Seven**

However, this approach to literacy is challenged by other critical theorists such as Freire who opted for approaches that were not as reliant on the written word, engaging in work that was more based on the spoken word and images (Freire 1988). The Harvard Educational Review editors in an introduction to an essay by Freire note that his approach to literacy is about the ability to understand “codified representations of the learners’ existential situation” which leads to

> Awareness of their right and capacity as human beings to transform reality. Becoming literate then means far more than learning to decode the written representation of a sound system. It is truly an act of *knowing* through which a person is able to look critically at the culture…and to move toward reflection and positive action upon their world. (Freire 1970b, p. 205).

These ideas are closer to the theoretical frame of literacy found in agro-ecology based FFS— and fits closely with the conceptual framework of ecopedagogy, which emerged from such critical theories. To Freire this is the critical difference between animals and human-animals. Human-animals based on an orientation to the world have the capacity to transform it— through language we have become historically constituted beings who thus have “a value dimension” (p. 206). To Freire this is the key to his term praxis: critical literacy means a

---

\textsuperscript{32} Defined by Matjila and Pretorius as when a student “reads with less than 90% decoding accuracy and 60% or less comprehension” (2004, p. 5).
deliberate, conscious, orientation to the world where how we code/decode is based on values, and a desire to impact positive change as we negotiate between our theoretical understandings and our behaviors. Importantly, critical literacy also takes issue with those who view “illiterates” as being in need of “food” – a “banking system of education” in which knowledge is seen as the prevue of the teacher who will deposit it into the empty minds of the poor and illiterate. Freire (and ecopedagogy) take the view that literacy must emanate from a co-production of knowledge co-production that is owned and valued by learners and educators as much as anyone else. This basic assumption about epistemology (and one could even argue ontology) will have major impacts for potential methodological approaches, as will be seen in Section Six, and more fully in Chapter Three. The ability to engage in critical literacy for Freire has absolutely nothing to do with the ability to have core literacy skills first. In fact, someone who has been so schooled may be less capable of engaging in critical literacy for they have already been taught to accept a banking model of education, and are going to potentially have greater, not less, difficulty in deconstructing the mythologies that their culture perpetuates, often through language and the written text (Illich 1970; Freire 1970a). The notion that it is a necessity to deposit core literacy skills into the minds of the learners before they can attain critical literacy is in fact an “alienating” experience to language, and antithetical to this approach to critical literacy. It focuses on a concept of literacy that is “not an authentic expression of the world” (1970b, p. 210). Ecopedagogy, as an extension of critical literacy, seeks to create more authentic expressions of human relationships to the world, to our ecosystems, and to the often troubled social relationships that are mediating our treatment of one another and our larger world (G. W. Misiaszek 2010; Kahn 2010; Gadotti 2010b; J. P. Miller et al. 2019).

This form of critical literacy, a Freirean and eco-pedagogical approach, doesn’t view illiterates (often coinciding with those who are poor, and also often a gendered group) as
being less than or needing some kind of cure in the form of knowledge, literacy, and so forth. Rather such an approach values these individuals as historically constituted beings like all others, and can approach literacy as a path to freedom and emancipation. Literacy for this purpose is based on the “authentic transformation of dehumanizing structures” – which the systematic oppression of women is certainly among.

Given this – the research question I pose for this section is:

Research Question Seven: To what extent does the prevalence and use of critical literacy education materials have stronger impacts on participants in the educational framework to be studied?

Having now completed my introductory treatment of these literatures, I hope that the cloth of these threaded fields of literature is becoming more apparent in its structure and pattern – more beautiful - and why new approaches to these problems are so loudly being called for by major international organizations and actors such as UN Women, UNESCO, FAO, and even in some respects groups like the World Bank, in addition to the scholars cited above. I will now, using the gendered elements in particular, attempt to focus these literatures into a set of more focused research questions for this dissertation. I do this, by adding one final piece of literatures, that of improvement science and continuous learning. I will argue that permaculture is a design system much like improvement science, can be a curricular manifestation of ecopedagogy (depending on if it utilizes critical literacy or not in its implementation) and that this NFE as applied in a specific case study example at a FFS in Western Kenya can serve as an example of a networked improvement community. This last literature will offer a lens through which to interpret and synthesize the other literatures, and upon which I can evaluate the entire project, which I will now elaborate on below.

Section Six: Networked Improvement Communities
Networked Improvement Communities (NICs) represent a specific methodological approach within Improvement Science. Improvement Science is the field that studies how to get better at getting better. It has many basic epistemological assumptions, most of which are counter to the hegemonic narratives that dominate how we currently construct and use knowledge (Wilcox, Hal, and Angelis 2017). For example, Improvement Science embraces failure, what Nancy Zimpher has called “failing forward” (Edmondson and Zimpher 2014, p. 3) and what many in the entrepreneurial community refer to as rapid prototyping, in order to learn from mistakes, and use data to get better, instead of to cast blame. Improvement Science recognizes that solutions should be approached with an attitude that is “problem specific and user centered” (Ibid, p. 2) recognizing that the local context is always consequential, and what works for policy in one location cannot be adopted and implemented in another without careful consideration and modifications in consideration of such context.

Within Improvement Science there are still varying attitudes about how this field should be applied methodologically. Certain core components are universal, such as those described above, and others demonstrate the variability internal to the discipline. In particular, this includes a range of approaches that are either more of a project and knowledge management variety, or those that are more towards the (still radical) spaces of participatory action research and design. In this section I will present literature that speaks to aspects of this range within Improvement Science, how and where NICs fall within this literature, and how the program of ecopedagogy curricula FFS being run by permEzone in collaboration with Community Mobilization for Regenerative Agriculture (C-MRA) in Western Kenya represent emergent NICs. C-MRA in Kenya and permEzone, represent the two organizations involved in running the test site for the eco-pedagogical curriculum in Migori, Kenya. I will give a fuller explanation of the roles of these organizations in Chapter Three when I address the setting of Migori. I will conclude this section by writing about my plans to conduct a case
study evaluation of this program to determine the extent to which it is actually functioning as a NIC and utilizing critical literacy as a curricular manifestation of ecopedagogy, which will be fully developed in Chapter Three. This evaluation would incorporate the critical components of the previous sections, and their research questions, which are embedded concepts and problems within the framework, either as part of the ecopedagogy curriculum, of the FFS, or of the framework as a NIC. Finally, this will setup the third chapter on methodologies that will explore how I can conduct this evaluation using a modified form of a case study methodology.

A Commitment to Share Knowledge – AKA the Knowledge Management Approach:

Networked Improvement Communities (NICs) provide an ethical commitment to their members to learn together by sharing in critical elements of the process. The key here is that this is a process oriented scheme -- there is no one right answer — and a design based system that addresses wicked problems, to “failing forward” (Edmondson and Zimpher 2014, p. 3). As measurement is a key aspect of improvement science, NICs have what Bryk and others refer to as kernels – key elements of their process and metrics. So the kernel resources for a NIC incorporate an agreed upon set of practical measures by NIC members so that they have a basis for learning from one another about what is actually working well or less well. Only the most essential and empirically/theoretically driven elements that advance a NIC’s aims should be part of the kernel resources (A. S. Bryk et al. 2015). This speaks to the need for such organizations/members to have a clear logic model – a map of how they imagine/observe sequential events having a cause/effect impact between the process they are engaged in and the outcomes they desire to impact (Frechtling 2007).
This speaks to one of those differences mentioned in the introduction from the more common epistemological mythologies. While “data driven” solutions is often heard of, IS often seeks to engage in a dynamic of knowledge creation beyond that – practice-based evidence (Green 2008). As Green notes:

The blame for gaps between science and practice falls variously on the stubbornness of the practitioners insisting on doing it their way, their hubris in believing they know their patients best and the smugness of scientists believing that if they publish it, practitioners will use it. None of these characterizations of the culprits is entirely fair, but they and yet others share in the blame. The diagnosis of the gap (even chasm) is not in doubt. (Green, 2008, p. i20).

But what is unique in Green’s diagnosis of this chasm is that part of what is driving the dominant paradigm is one where evidence “is produced and delivered to practitioners” (ibid.) – the pipeline only has information flowing in one direction – upstream. Green challenges researchers to consider instead the critical value of practice-based evidence, and the alternative epistemology that this then is demanding. This is part of what is embedded within the notion of kernels.

This practice-based approach – testing what is actually working is an example of some of the ethics within NICs. This is also the reason that continuous evaluation is so critical to determine the dynamic flow of knowledge (discussed in greater detail in Chapter Three). That knowledge production needs to be democratized, and more participatory, even within how researchers think of knowledge management, such as the idea of a kernel. Any change by one member to its kernel should be reported to the rest of the NIC so that they can all consider the merits of such a change, always bearing in mind the same essential three questions:

1. “Why is some adaptation thought to be needed?
2. What change will be introduced and why? [how is the proposed change consistent with the core concepts and design principles undergirding the network’s theory of improvement?]

3. What evidence will be considered to examine whether the change is actually an improvement?” (A. S. Bryk et al. 2015, p. 155-6)

These are the same three questions that need to be asked over and over again in the epistemology of the NICs. And indeed this is why permaculture is so well suited to be framed as an example of such a learning community, and should be researched and investigated for potential insights it may be offering as an emergent example of such NICs. The founder of permaculture, Bill Mollison notes in his opening pages to one of the seminal works in the field that permaculture is “centered on human settlement and community, it holds the welfare of man and the needs of the people it is intended to serve as the paramount concern” and he explains the radical intent behind this reorganization and structuring of priorities of humanity to the relational when he notes that permaculture is, in brief:

A philosophy of working with, rather than against nature: thoughtful observation rather than protracted and thoughtless labour: and of looking at plants and animals in all their functions, rather than treating any area as a single-product system. The difference is like that which exists between the Aboriginal and the ploughman: the latter is seen as one who would cut open his mother’s breast to obtain milk, the former take only what is given freely, and takes it with due reverence (Mollison 1979, p. 1).

Mollison goes on to note that the changes to any complicated problem come “first at the basic philosophical level” (Ibid, p. 2) and are more a matter of “a search for the right question, rather than the right answer to any question” (Ibid.). This relational conceptualization, coupled with a recognition of complexity, and a desire to engage in knowledge production that has information flowing dynamically in the pipeline, not just from ‘academic experts’
upstream, but from practice-based evidence as well – all speak to manners in which one can see how NICs and permaculture could line up. The goal of this dissertation, as previously stated, will be to evaluate if they in fact do.

permEzone, C-MRA, and Permaculture Research Institute of Kenya

With the farmer field schools and extension work occurring in East Africa there already exists many of the pieces for a NIC to emerge. The NIC may already exist, it certainly has the main “ingredients” needed for such a network, and it is at the very least claiming to engage in many of the behaviors I would expect of such an organization (such as intentional collective impact). The purpose of this evaluation, is in part, to determine if it is in fact actually emergent. In particular, there are three initial organizations that were involved in creating this NIC: permEzone, C-MRA, and Permaculture Research Institute of Kenya (PRI-Kenya). Of these only permEzone and C-MRA remain involved in the NIC, with PRI-Kenya having dropped out of participation due to significant structural problems in the organization. This had to do with some all too common problems of embezzlement within an LLC operating in SSA, as well as capacity building and structural issues that cost them key personnel who were driving the previous work. An additional organization has since joined this NIC, Broadfield Enterprises Uganda (BEU) and new FFS are being setup in Uganda as part of this NIC via BEU. The project that PRI-Kenya was involved in has continued independent of PRI-Kenya, as have many of the leaders and staff, but the institutional affiliation no longer exists. Sheena Shah, the main contact I worked with at PRI-Kenya, and

33 Mollison himself was an academic who walked away from the academy in order to instead engage in more practice-based knowledge creation and thus gave birth to the permaculture movement.
who ran their educational programming, and then was the director of the organization, is now a private consultant who continues to work with the team.

There is some disagreement within the literature about not only how a NIC may be assembled at first (which I will address momentarily), but importantly, what some implications are for what such structures would have on methods. Bryk & Gomez are open to two possibilities in these initial stages for how a NIC should be convened or assembled:

1. Convene a small group to do the “up front work” of defining the problem and creating some working ToC and ToA or
2. “Assemble the interested partners and then identify” the problem and how to pursue it together (2015, p. 160).

This debate and these two options speak to the variety that exists within IS and the subsequent methodological implications that such choices end up having. To further appreciate this I will unpack each of these further a little bit in the subsequent paragraphs. While Bryk & Gomez are open to this first possibility – convening a small group that the initiators of the NIC have hand-picked for the leadership - for others, particularly Pascale, Sternin & Sternin there is no such deliberative choice. For Pascale, Sternin & Sternin a NIC must function by operating through a convening because only through such a process can the they unlock solutions that are “based on the sociocultural context of each program community. It must always be, by definition, ‘ours’, and is genetically ‘culturally appropriate’. Positive deviance (PD) works like nature works. Like Darwin’s finches of the Galapagos Islands, each successful adaptation must be appropriate to the local ecology” (Pascale, Sternin, and Sternin 2010, p. 44). A big part of the reason that Bryk and Gomez seem open to an alternative to this is one of expediency, “the challenge with this arrangement (the second option for a convening) is that it takes a significant commitment of resources up
front” and “there is no guarantee at the front end that if we build it, they will come, so funders must be willing to accept a higher opening risk for any NIC developing along these lines” (2015, p. 161).

However, frankly this reason seems to fly in the face of much of the logic laid out elsewhere by Bryk and Gomez that to ensure buy in and sustainability of such projects the inclusion of all voices is integral and that you go fast by going slow34 – while such programs may take longer on the front end to build up, they end up with higher chances of success and actually minimize risk. So this seems like a contradiction in proposed methods offered by Bryk and Gomez compared to their own theoretical framework. Majora Carter loudly calls attention to this in her viral TED talk about community development and planning in which she calls on people to stop “wasting me” and other human resources and voices amongst the most marginal who don’t get their voices included in the decision making tables about such strategies (Carter 2006). Bryk and Gomez do point out in defense of strategy 1 that wider teams can lead to a more likely solutionitis approach, as a broader team of experts may be more likely to come with preconceived expert ideas and fixes, and they may also make creating a working theory of improvement more difficult due to the number of voices that need to be integrated. That being said, Pascale, Sternin, and Sternin seem to emphatically shut down such arguments. While they give dozens upon dozens of examples of their PD approach using IS, and fully admit that this is a time intensive approach, they also point out that when dealing with wicked problems that have proven intractable in solving using other methods, that to skip elements of this participatory design, to have shut down voices in such manners, would have prevented their successes. In the case of the Vietnamese malnutrition project, they give as an example their workers who were interviewing families and collecting

34 “Go fast by going slow” means that to better ensure success you scale slowly, you learn slowly with multiple iterations, and failures, in smaller scales, and then you go fast with successful implementation at scale.
narratives to establish what were normative behaviors (in order for comparative basis to establish the outlying positive deviants from which to learn how to solve the problem with local wisdoms). And although they had reached saturation, and were no longer gaining new information, and the resources being spent to continue interviewing were substantial investments of time and energy to reach these locations, one of the volunteers pointed out:

Although I’m not learning anything new either, there are still another three or four households in my hamlet that haven’t participated in these focus groups. Several of them are the poorest people in the hamlet. If I don’t go and listen to them, they will feel hurt, and conclude that I don’t think they have anything to contribute. If I’m going to need their cooperation later on when we begin our program, I better go and listen to their ideas. –Tuyen as quoted in Pascale, Sternin and Sternin p. 31

So while there is some debate amongst the advocates of IS about what methodologies can be used and to what degree a participatory design is inherently required of this process, it isn't only the content and knowledge production that matters. It is the very mechanism itself, the way in which it builds trust and fosters vulnerability, which creates a different culture for a learning community, and different risk profiles for people to experiment and learn together (Brown 2012; 2018). What all agree on is that a network hub exists to enable collective action, and a big part of this means it “is an ongoing responsibility of the hub” to “identify relevant research findings and make them easily accessible” to the members (Bryk et al. 2015, p. 158). I will more fully explore the methods for this study, and why they are particularly appropriate and well suited to this topic and framework, in the following Chapter Three, On Methods.

The component of this NIC I am studying in Kenya, definitely used more of the “front loading” of identifying specific leadership, leaders, and organization, with whom they would work, as opposed to more of the grass-roots, grass-tops, and participatory approach of the Positive Deviance leadership approach. That being said, as will be noted later, there are aspect of the participatory design in this NIC as well. However, the core team of leadership
was largely pre-determined by a more hierarchical and classical structure, and includes key people from permEzone, C-MRA, and formerly of PRI-Kenya. (The new organization that has joined BEU and is working in Uganda will not be part of this study).

The presence of permEzone and C-MRA, among others, to coordinate their efforts towards collective impact, what Nancy Zimpher called “the thousand points of light” in her keynote address to ACE in 2018 speaks to this emergent collective impact model. This shows a more deliberate desire to impact turning those thousand points into a sustained fire. Other indications they are engaging in collective impact include advocacy work of theirs to influence both regional and national level policy around education and agriculture, both in content and process/approaches. This includes permaculture (and lately more critical literacy aspects, what I would argue are at the very least quite close to ecopedagogy) as well as participatory action research (PAR) designs.

The members of the core team from C-MRA and permEzone include:

C-MRA (Migori, Kenya)

- Paul Omollo
- Sheena Shah (now operating as an independent consultant in coordination with permEzone)
- Reagan Okoth

permEzone

- Hugh Kelly
- George McAllister
- Elin Duby
Details about the research team’s composition, background, and capacities will be elaborated on in Chapter Three.

C-MRA is currently in the process of identifying the 20 farmers who would be the main voices from this community and would be the primary potential members of a participatory approach. The farmers for the extension work for Migori have already been identified. They would also be the ones setting up the model farms and engaging in the extension work of teaching their fellow farmers.

The Emergence of an ecopedagogy NIC in East Africa? Research Question Eight

Other examples of this emergent NIC of permEzone, C-MRA, and formerly PRI-Kenya include aspects of participatory involvement of the citizen-scientist farmers. Their engagement in the design and collection of data in order to both document variability and learn how to improve is critical to this practice and its veracity as a NIC. This goes beyond the mere “technology transfer” literacy of other FFS mentioned in Section Four. This is because for this type of FFS to rise to the level of a NIC the citizen-scientists must be able to explain the logic of what was done, why, and what was learned, otherwise the network can’t learn from them and collective problem solving doesn’t work, or minimally is weakened.

Two examples of the participatory documents created in Migori, Kenya are attached to the end of this dissertation that the farmers created and are using\(^\text{35}\). This is why there is such an essential overlap in the epistemological attitudes of a critical theory oriented approach, both to literacy and to leadership, with the conceptual framework of improvement science and

---

\(^\text{35}\) See appendix items ii. Monitoring and evaluation tool co-created by farmers v. examples of PAR monitoring and (continuous) Evaluation systems setups by permEzone and C-MRA and vi. Participatory workshops
NICs, which require this deeper unpacking of links and a more critical literacy. A critical component of NICs is to investigate variability and determine what is working, for whom, under what conditions. The purpose of such knowledge is to then organize it for the purpose of collective action to aid others at getting better at getting better in order that they can learn how to positively shift the number of those experiencing positive outcomes based on what is learned through variability. With this in mind I can articulate my eighth research question:

*Research Question Eight: In what ways are we seeing evidence of a Network Improvement Community emerge in Asumbi?*

*Sub-questions: Indicators that a NIC is in existence or emergent may include:*

- evidence of failing forward, sharing of knowledge, evidence of “kernels”, vulnerability being cultivated in group, PDSA cycles, or rapid prototyping.

*Cultivating Trust:*

To create collective impact via improvement science, a core network with a foundational culture must be established, and paramount to this is the establishment of trust and mutual vulnerability (Coyle 2018; Berwick 2003; Brown 2012). It requires conscious and deliberate effort to create such a community and culture, to engage with membership in such a way that it is possible (and even easy) for them to participate, to validate one another’s work, to critique it, to share in the benefits of membership which includes the knowledge gained from one another. To create collective impact via improvement science also means learning from one another’s failures, and equally important the emotional support offered in facing and dealing with the same wicked problem (which can often create burn out absent such a support network). To share in failure requires significant trust, to use data “like a flashlight” instead of “like a hammer” (Jennifer Blatz, CEO Strive Together, personal interview, 2019). And what Jennifer said she meant by this, who herself runs over 70 such NICs, is that when
exposing failure groups are taking major risks, there is the risk of backlash, of blame, what is often called the blame of proximity (so for example, bad scores in education for students get blamed on teachers, they are the closest, even though this is a wicked problem, and the reasons behind the scores may have very little to do with what that specific teacher). To engage in this kind of work, trust must be established, and people must be willing to take risks, and be vulnerable. Face time is essential early on in this process, though other mediums such as email, phone and social media can augment and reinforce such ties. However a close reading of Pascale, Sternin and Sternin, as well as Coyle, reveals that many adherents of this process advocate for methods that go far beyond this and call for significant time in small settings with their core teams on a regular basis (A. S. Bryk et al. 2015; Pascale, Sternin, and Sternin 2010; Coyle 2018; Surowiecki 2005). In this regard, there are both strengths and worries for permEzone and C-MRA regarding early indications. Aspects of the leadership are often quite remote, but the more participatory components of the teams, and the field teams, are definitely much more engaged in that kind of small team intimate work.

When Sternin goes to present results on female genital mutilation (FGM) in Egypt, and was able to successfully not only identify “positive deviants” (which in the case of Egypt at the time had a 97% prevalence of FGM) but was able to even get those who had avoided FGM or experienced FGM to testify, on video, about their experiences to help educate others. The reaction from other health care workers and government officials was one of complete shock. They were stunned. How were you able to collect this data? They ask her very directly, “How did these people come to trust you?” to which she answered with her own question “Exactly, how do we create trust? What does it take to create an atmosphere where people will talk?” (Pascale, Sternin, and Sternin 2010, p. 68).

Coyle picks up on this aspect from a slightly different angle, recognizing some of the deep-seated manners in which our neural maps and evolution have driven such processes.
The amygdala, which is responsible for our “fight or flight” response, but is also responsible for our sense of belonging. Interestingly, while the amygdala is the part of our brain always scanning for danger, and in the modern world is often the cause for unnecessary anxiety and worry, it can completely switch its role when given what are called “belonging cues” – indicators that this is a person who is important in your social world. This signaling is so strong it is visible, the change, in how this part of your brain functions via functional MRI brain scans, as this part of your brain will light up (show activity) in a completely different way when it is scanning “strangers” and random possible events for lurking danger, as opposed to “the moment you are part of a group, the amygdala tunes in to who’s in that group and starts intensely tracking them. Because these people are valuable to you. They were strangers before, but they’re on your team now, and that changes the whole dynamic. It’s such a powerful switch – it’s a big top-down change, a total reconfiguration of the entire motivational and decision-making system” (Jay Van Bavel, social neuroscientist at New York University as quoted in Coyle, 2018, p. 25). How do groups achieve this? Or as Sternin put it, “how do we create trust”? Coyle identified a few major ingredients to this, including the three main elements to belonging cues: high energy, individualization (you treat each person as a unique and valued member), and future orientation (this relationship will continue and is important) (see Coyle, 2018, p. 11). This leads to a critical sub question:

Sub question: In what ways are trust and vulnerability cultivated by permEzone and C-MRA? In what ways have they failed to establish trust/vulnerability?

Closely related to this aspect of NICs – trust and vulnerability – is a component of leadership, and specifically adaptive leadership, which relates to more critical attitudes to wicked problems. The ability of NICs, and this NIC in particular, to cultivate such adaptive leadership (and what adaptive leadership means) will be explored in this next sub-section.
Adaptive leadership builds on the ideas of the wicked/tame problem by pointing to the ways in which common executive leadership selects for those who are “accustomed to solving problems themselves” (Heifetz and Laurie 1997, p. 171). Whereas adaptive leadership is about an ability to tolerate tension, as is required of a wicked problem, instead of attempting to tame it, and an ability to give the work back to the people by tapping “into the collective intelligence of employees at all levels” (Ibid, p. 172). Just like the wicked problem, adaptive problems are often systemic and don’t typically have ready-made answers. They require leaders who can listen, and facilitate, instead of who adopt a command and control execution of leadership. This means that adaptive leadership requires breaking the pattern of “providing solutions” (Ibid., p. 173) which is what Bryk and improvement science would call “solutionitis”. This is why there are deeply embedded components of leadership within the frameworks and approaches I am using.

NICs require distinctive leadership frameworks and characteristics. Top-down controlling, and authoritarian style leadership is not suited to such networked learning (Lindamer et al. 2009; A. Bryk, Gomez, and Grunow 2011). An example of the importance of listening in such a culture is given in the positive deviance approach, where Dr. Lloyd who was one of the facilitators for this approach being used at hospitals to eradicate MRSA stated that his epiphany in part was ceding the need to “always be in control” (page 119) and give the answers to questions he asks. Our discomfort with long (and by long I mean something as short as even ten to sixty seconds of silence) periods of silence create a culture in which certain types of power dynamics are rewarded and certain personalities always become dominant in social circles (Pascale, Sternin, and Sternin 2010 - see chapter "Hospital Infections"). Dr. Lloyd when watching a video of his own facilitation cringes at his
unwillingness to allow for pregnant silences, and upon discovering this epiphany, the need to actively listen and cultivate dialogue through comfort with silence declares, “it was a humbling experience” and thereupon ritualizes the twenty second rule, declaring that “the twenty-second-deep-breath-and-be-silent” PD mantra evolved as a result of this (Ibid. p. 119). So one major question that emerges becomes:

Research Question Nine: In what ways does adaptive leadership emerge within this NIC?

There are other elements related to the distinctive leadership roles of networked communities. Unlike many other forms of research-practitioner partnerships – a networked community pushes these boundaries further in that it requires a commitment to learning through a theory of practice and an “ability to problem solve” that are “central to a NIC” (A. S. Bryk et al. 2015, p. 162). Again, the shift is from ego, did “my project work” to one of collective action did “we effect measurable improvements reliably across diverse contexts” (Ibid. emphasis in original). An example of how far this ego challenging framework for leadership is embedded within NIC – is an aphorism by Bryk & Gomez that the guiding spirit of leadership should be that it is “possibly wrong and definitely incomplete” (Ibid. p. 163). This point leads directly to another branch of critical theory, this time being applied to leadership, a very young and emergent field, known as critical leadership theory (CLT), which I will explore briefly next.

Adaptive Leadership and Critical Leadership Theory: Staying Attuned to Ego and Power

This calls attention to an important element of how adaptive leadership and CLT concerns align. CLT scholars have pointed out the manners in which most leadership theories have ignored the perils of overstated claims, and an unwillingness to realistically consider what
unintended consequences are likely from failure and how likely failure really is when attempting a new project (Alvesson and Spicer 2012). For this reason critical leadership theorists have been calling for more reflexive practices within leadership in order to cultivate a practice in which ego is less centralized – such that more honest assessments can be made (Collinson and Tourish 2015). Critical leadership posits that this overemphasis of power is a direct result of the methodologies embedded within our approaches to research and practice – a top down approach (L. T. Smith 2012). An approach that ignores the power differentials of real people, the actual manners in which implementation occurs based on agency (Weatherley and Lipsky 1977). It is an anti-democratic culture within leadership studies (Collinson and Tourish 2015) by ignoring others agency which is what critical leadership studies seek to combat by cultivating a more reflexive leadership. This is precisely the kind of leadership that both Bryk & Gomez as well as Pascale, Sternin & Sternin all call for, representing the “bookends” of the various approaches being currently offered in IS, such as within the Carnegie Foundation or as the Positive Deviance Approach.

Failing Forward: Sub question

A guiding spirit of leadership within NICs – “possibly wrong and definitely incomplete” – the mentality that critical leadership calls for as noted in the previous thread – points to another fundamental component of what and how such leaders operate:

Learning from failure is at the heart of improvement.

Bryk, Gomez, Grunow, & LeMahieu 2015, p. 163

Such a statement is hard to overemphasize. It is a shift in epistemological attitude. Leadership is often seen as focusing on what is working, instead of looking for what might be
amiss, or where more diverse voices can add perspectives to better understand positive and negative deviants that the system can learn from. Getting to such data (what went wrong) is difficult as it requires a high level of trust, vulnerability, and risk taking, and it goes against normative organizational culture (Brown 2010). This organizational style is particularly true among hegemonic spaces that continue to commit epistemicide, where other forms of knowledge and knowledge production are discounted and/or silenced (Andreotti, Ahenakew, and Cooper 2011; Santos 2014; Love 2019; Paraskeva 2017). It is not some passive accident that leadership theories are so plagued with a narrative that largely ignores the perils of an overinflated sense of self and capability and ignores the manners in which they cultivate anti-democratic norms and reproduce authoritarian power structures by ignoring others agency.

When critical leadership theorists point out that, remarkably, 2/3 of leadership studies do not give a strong definition of what leadership means (Palmer and Hardy 2000) we are creating a concept (leadership) that “becomes a dominant social myth of our time” (Alvesson and Spicer 2012, p. 368). It’s a function of the socio-cultural history into which such conceptualizations have evolved. So the critique that critical leadership theory implores scholars of leadership to consider, is in part, being answered by NICs, by embracing, loudly, the recognition of the limits of knowledge, and a readiness to embrace learning from failure, and cultivating the wisdom of others, particularly those typically left out of decision making processes and knowledge production systems, as equitable partners in leadership and decision making (Lawson et al. 2015; Pascale, Sternin, and Sternin 2010). They require leaders who can “tolerate ambiguity” (A. S. Bryk et al. 2015, p. 163) in order to listen to others and cultivate new, emergent ideas, instead of listening to whatever voice and power is loudest.

The Bookends of IS: Knowledge Management or Participatory Action Research? Sub questions
An important point about a range of approaches that exist within the scholarship of improvement science needs to be made here. While there is wide ranging consensus amongst such scholars about aspects of what improvement science should include, there are also meaningful and important variations and differences in approaches to methodologies, priorities, and emphasis in process. These can be most easily thought of as two bookends, one largely represented by the scholars at the Carnegie Foundation for the Advancement of Teaching, and the other by the approach of Positive Deviance as articulated by Pascale, Sternin and Sternin (2010). This dissertation makes use of aspects of both of these and I will acknowledge where I am utilizing each at various points and why. Carnegie places a much stronger emphasis on the element of knowledge management – albeit in manner that clearly emphasizes the importance of such knowledge management (a term they themselves use) for the purpose of ensuring democratic ease of access to information. However, we shall see that the positive deviance approach takes issue with this entire conceptualization of knowledge management, insisting that knowledge is too socially constructed and situated to be very easily thought of or shared in such a manner that is stripped of the narrative component of sharing of information. By and large, this dissertation adopts Pascale and Sternin’s approach to knowledge management as socially constructed and in need of narrative to be properly transmitted. However as will be demonstrated in the findings, there are clearly examples of a more techno-bureaucratic transfer of knowledge that are occurring as well within the collective action taking root, though to a much lesser degree, and not one that was encouraged by the trainers or educators involved.

While these differences may seem picky and mild, they will have implications for the range of methodologies considered appropriate by the bookends of scholars representing improvement science. And therefore where I end up deciding my own values lie, coupled with what is pragmatic, will have important implications for how I conduct my own research.
and self as I orient to such literature and practice. So this dispute is more amplified and important than it may seem. *Both approaches are legitimate within the scope of improvement science, but one will allow for more of a centralized methodological approach whereas the other will completely insist on a radically democratic process via participatory action research.* This dissertation will solidly land in the latter end of this spectrum within this contested terrain, and engages in participatory action research for these reasons. It would have been a violation of my own ethics, and how I am interpreting the literature to have done otherwise, I do not think nor believe that a method that doesn't engage in such a process would work with fidelity or rigor. This was a shared viewpoint by the leaders of permEzone, members of the monitoring and evaluation team, and the educators working within the farmer field school. That isn't a coincidence, considering that such a PAR approach is more rooted in critical literacy, which his part of the reason that this permaculture curriculum as manifested in this particular farmer field school seems like such a rich candidate for studying what a potential ecopedagogy educational policy could look like in practice, and be interrogated as a consequence. There was a reasonably unified cultural attitude among those engaged in this work, that all voices, perspectives, knowledges, mattered, and that they needed to be included in decision making processes and thought of as citizen-scientists.

There is also evidence that Carnegie is of late considering pivoting more towards the Positive Deviance epistemology themselves, having highlighted aspects of this method in their own research and website lately. These tensions and consequences will be more fully explored at times in the remaining parts of this chapter, and then the consequences for my methods will be dealt with in Chapter Three.

What both bookends of improvement science recognize, is the importance of variation. The originators of this field have come to this conclusion in part as a result of their pushing back against more dominant forms of research that tend to use aggregated data, which they
insist on avoiding. As Tony Bryk himself said at the Carnegie Summit in 2019 “when we are dealing with averages in data we have average data” (Summit Keynote, 2019). It’s a different way of looking at where answers exist within datasets. The attitude is that it is within the outliers that we can often discover a unique process or program that has stumbled upon something that the rest of us are missing. Something in that outlier data set is working for some subpopulation under some circumstance. If that can be better understood, perhaps it can be expanded to work for a larger group under wider conditions. What allowed for it to work under that setting? This is the prism with which IS tends to approach a data set, and it can only do that with disaggregated data. Improvement Science isn’t so concerned with the average, it tends to be much more interested in the unusual, the misfits, the odds beaters. Analyzing variation therefore becomes a core hub function. By leveraging the hundreds, and thousands, of citizen-scientist farmers\(^\text{36}\) who are all conducting their own mini-experiments about yield, nutrient loads, design of the land, coordination of varying species, etc. just in this region of (originally both Uganda and Kenya – but now Western Kenya), within the frame of a NIC, they become empowered to learn from one another and share knowledge. They now have at their hands the potential for a vast data set on what is or is not working, for whom, and under what conditions. What is critical here is the variation. The claims of improvement science are that scaled implementations often fail because they disregard the varied conditions under which implementations are being applied. This is where improvement science and collective impact take a different approach, instead being hyper-focused on this element.

\(^\text{36}\) Which in reality is what all farmers are once even mildly empowered, farmers are constantly experimenting with yields, soils, supplements, seasonality’s, weather, etc. See the UN symposium on Citizen Science that was held in 2018 in Dubai for a rich discussion on this topic.
As such variation is key to determining how to leverage change and use collective impact, several sub-questions emerge:

Research question 9.1: To what extent is there a participatory approach to the documentation of data? How is the variation in the data being captured, and by whom?

These seemingly simple questions begin to reveal some of the tensions between the bookends demarcating the different approaches to improvement science. If we are able to identify even a single odds beater, often referred to as a positive deviant (Pascale, Sternin, and Sternin 2010) we can learn a great deal. Positive deviants reveal hints at how systems that are often rooted in oppression and designed to create failure (Illich 1970) can be restructured for success at scale.

Various modern tools, such as Diigo, have made digitally curated living libraries easier to create, and collaboration and the sharing of knowledge in the information age is certainly different. This is worth considering when thinking about what the implications of that are for a knowledge management approach, and what that looks like then for those seeking to do that with project management and implementation. Even among those we typically think of as “developing countries” the saturation of such communities by mobile phones and increasingly by smart phones has radically altered access to such sharing of knowledge and banking systems. Both of these components will have implications for the findings in this dissertation and be discussed in Chapter Five. PermEzone has chosen to test the ability of the site to scale their success and share the process and content (knowledge management, but with attention to context) for this curriculum. A goal was to determine if this enables a breakdown of silos and communication, defragmenting the various groups and knowledge that are often prevented from flowing (Conklin 2005a), and thus empowering the people themselves, in this case farmers, to better engage in the sharing of knowledge. The idea here
is that they are the ones who know best, but they need to be better equipped to embrace their own political power and voice in this regard, and tools with which to share the success of these policy ideas. This is what the scholars at the Carnegie Foundation so strongly implore those who build NICs to do, in order to achieve collective action.

According to Jennifer Russell, writing for Carnegie’s Foundation for the Advancement for Teaching, a leader in North American research on NICs, the successful initiation of a NIC is centered around a shared specific problem of practice (https://www.carnegiefoundation.org/blog/how-to-launch-a-productive-network/ Retrieved November 11, 2018).
The problem that C-MRA, permEzone (and previously PRI-Kenya) are all chasing after certainly represents such a shared problem of practice. The specific problem of practice being shared by the members of this permaculture NIC is: how to create more eco and socially regenerative communities? With a specific focus centered around how food, cash crops, and medicine are grown, prepared, and distributed. They are united in their efforts to tackle a wicked problem, but there is specificity in the vision and mission they have set out to wrestle with. This speaks well to their chances for successfully navigating the early stages of creating a NIC. That being said we’ve already seen one critical organization drop out, due to significant systemic problems internal to their organization. It is completely possible that this enterprise is failing. What, interestingly, should make it different from many other enterprises even if it is failing, is that if they are really embracing some of the aspects of improvement science and ecopedagogy, then they are more likely to be very loud about their own failures, to broadcast them, to embrace them, to be willing to learn from them, rather than to hide them. If I were to discover they are failing and they are attempting to hide it, this would be the most damning of evidence that they are not being genuine in their efforts to adhere to these principles.

---


38 As noted at length in sections one through five, solving regenerative farming practices incorporates a slew of other problems, from how climate change is impacting rain and erosion patterns, to youth migration out, to the discrepancies between power dynamics of gender in who owns versus who farms the land, to the inverted economic incentives to use synthetics that entrap farmers in debt and leave their soils further depleted long term. Tackling a resilience eco-design system is a wicked problem par excellence.
Participatory Action Research: An Epistemological Counter

To return to an aspect of one of my sub-questions – are farmers documenting their observation – the positive deviance approach would say that a major reason we may end up with a resounding “No!” to this question is embedded within the epistemology of the method and approach. To PD the issue is not knowledge management, the issue is not having the “right answer” to a problem, but rather ownership of the knowledge and an understanding of how knowledge is socially situated and constructed.

It is for this reason that the PD approach within IS is so insistent on a PAR orientation. Honig and Venkateswaran (2012) point out the essential role that people’s sense-making activities play in interpreting and translating data into evidence – a social activity – because data and evidence are socially constructed forms of knowledge. As Wilcox, Lawson, and Angelis put it, “data do not speak for themselves, nor do they automatically earn the status of evidence” (2017, p. 5). For improvement science to be effective, it must methodologically consider how sense making is taken into consideration as part of the collection of evidence, of the process of observation, discovery, and exploration of an idea, all leading to implementation of that evidence (Levin & Datnow, 2012). A PAR approach will hopefully create such a dynamic where farmers feel empowered and have elevated voices and engage with their own data and share knowledge.

If the farmers were not included, equally, in a participatory approach, in which the indicators involved and the knowledge being measured, valued, explored and implemented is not co-owned by them, then why would they care about it? Why are good ideas so often not
implemented with fidelity, or implemented poorly? This is the frustrating reality that improvement science seeks to address, and it is rooted not just in the knowledge, we often have the knowledge, but it is equally rooted in the manners in which we are approaching knowledge creation and implementation, and reproducing undemocratic methodologies that reproduce power dynamics that exclude the masses from sharing in discovery and therefore in ownership of ideas and implementation of that socially constructed knowledge. Both bookends of improvement science – from the positive deviance to the more knowledge management approach, have ample evidence to back up their positions. PermEzone and C-MRA have engaged in some participatory workshops with the villagers, farmers, and trainers, including participatory indicators, so they are using elements of both approaches.

Face to face time, and fostering some intimacy is invaluable at the initiation of a NIC (A. S. Bryk et al. 2015), which is being accomplished through the months of training of trainers that permEzone, C-MRA, and previously PRI-Kenya engaged in with their farmer citizen-scientists before they began/begin implementation. However, this time is present only within certain elements of the group. Other aspects of the outside leadership are extremely absent from this more intimate face time and presence. They have articulated reasons for doing this deliberately so as to empower others to have more autonomy and to break down silos of communication that prevent meaningful interdisciplinary interaction, however it raises concerns about how trusting some of the relationships may be in actuality given the absence of physical presence and intimacy of relationships? Has enough trust and vulnerability built up in order for people to take risks and engage in the process? The question remains, will we see favorable outcomes for collective impact from these FFS towards impact on regenerative design based on permaculture and ecopedagogy? That is the problem of practice that this dissertation would attempt to help interrogate, while keeping in mind that it is the variability that is so crucial for improvement science. This isn’t a binary
yes or no, but rather a seeking out to discover **when it is succeeding**, for whom is it succeeding to produce regenerative landscapes and ecosystems, under what conditions, and why. If any such positive outcomes exist, particularly under difficult and unusual conditions where we would have expected worse results (so they are out performing, they are an Odds Beater or a Positive Deviant) – then we have the seeds for a solution, which is what both methodologies within improvement science seek out.

The Positive Deviance Approach:

However, the presence of a group and its willingness to seek collective action and share understanding is no guarantee unto itself that a NIC will emerge. There are many other hurdles that need to be cleared. Perhaps one of the greatest remaining pitfalls is what Bryk & Gomez coined as “solutionitis” which is “the propensity to jump quickly on a solution before fully understanding the exact problem to be solved. It’s a form of groupthink in which a set of shared beliefs results in an incomplete analysis of the problem to be addressed and fuller consideration of potential problem-solving alternatives” (Bryk et al. 2015, p. 24). Such solutionitis stems from several gaps in approach, chief among them being the lack of a fully understood and articulated problem. One of the best remedies to this is to ensure that a complete theory of change and theory of action, has been articulated, *and is inclusive of the member-voices involved in the problem being sought to address*. While the Carnegie Foundation and Bryk and Gomez have become perhaps the most famous academics applying improvement science in education, the “fathers” of the field, their work builds heavily on others, particularly Richard Pascale, and Jerry & Monique Sternin (a married couple) who first articulated many of these ideas in the health care field. When reflecting on a specific example of the implementation of this process, which they call positive deviance (PD) in Vietnam to address the malnutrition of 65% of the children, they write:
The larger point here, too often those in sponsorship, expert, or authority roles can generate unconstructive dependency among their followers. This dependency can absolve the community from owning the solutions it must adopt for change to succeed. When the group becomes the guru, members ‘credentialize’ themselves as change agents. We learned in Vietnam that problem identification, ownership, and action must begin in and remain with the community. Community members are the opportunity and the source. When the villagers stepped up and became accountable for the design of the feeding workshops, they introduced nuances that would have been hard to grasp from afar – let alone implement top-down. (Pascale, Sternin, and Sternin 2010, p. 50)

Put another way, such an approach using improvement science, is inherently a participatory action research approach. This is built into the very essence of the epistemology of this approach because it works based on a logic that:

1. the wisdom for how to solve such wicked problems exists within the expertise of those who know those problems best - the people experiencing them directly
2. that “contrary to widespread faith in communication and ‘knowledge transfer’ information has a social life, and unless new insights are embedded in the social system, they evaporate” (Pascale, Sternin, and Sternin 2010, p. 113)
3. the best way to ensure uptake of solutions is by including the voices of the local experts and using a participatory action research approach, in which you have “internally developed solutions [that] circumvent rejection triggered by a solution deemed ‘foreign’” (Ibid. p. 107).

That is, “you go fast by going slow” (Ibid, p. 118). While PAR is a perhaps notoriously slow approach to project development and implementation, these projects often take many months to develop and years to implement, they also actually work, and they have a strong history of being self-sustaining, at scale, as they grow “slowly”. The website www.positivedeviance.org lists some of the hundreds of examples of such empirically driven research that testify to the success of this approach. Going back to the research sub-question around documentation/observation – the bookends of Carnegie’s IS rooted in knowledge management vs. that of PD rooted in an epistemology of action research and the locals as
experts would approach not only the answer to this question differently, but the reasons for why you discover those answers differently. For the PD approach the answer is rooted in whether or not the people themselves are empowered to partake in the research and are partners in the knowledge being generated, a point I will return to later in this section.

Avoiding Solutionitis with A Theory of Action & Theory of Change: Further Sub Questions

It is with this in mind that we reach our next two sub questions. The first is meant to explore if the members of the team are engaging in theory of action/change work, and taking some minimal steps to help ensure they avoid solutionitis by having a well-defined problem, with well-defined theories for how to leverage changing it, before engaging in such change work. The second is meant to probe if/how they are using the PAR approach [which permEzone and C-MRA claim they subscribe to]. This allows us to test out some of the ideas and values so important to the PD approach to this kind of research, by probing for local voices and experts (aka, villagers, farmers, people of all ages and gender, a wide representation of those affected by whatever problem is being explored, etc.) in the conversations creating the theories of action/change itself. This again speaks to the proximity of the critical theory components of the previous sections, the ecopedagogy critical literacy component, and the overlap with a PD approach of PAR. The sub questions I have designed to probe these aspects include:

Research Question 9.2: Are theories of action (ToA) and theories of change (ToC) developed before diving into solutions?

Research Question 9.3: When actions are taken in what ways is there evidence of a clear framework for thinking about why an innovation is thought to be needed or why it is thought it will function well?
Sub questions: Are there representatives of various stakeholders involved in the process of creating a ToA/ToC (and other designs aspects, the metrics, etc.)? What evidence exists of various stakeholders participating in such processes, including local voices as experts with genuine power in process?

A Turn To Methodology:

I have decided that the best way to conduct this research is to conduct an evaluation of the case study of the farmer field school that permEzone and C-MRA have run in Western Kenya (in the Migori Region). This farmer field school has implemented an intended curriculum using permaculture and claims to be utilizing a more PAR approach as well as critical literacy. If this bears out in the evaluation in the attained curriculum, what the farmers have learned, co-created in the knowledge, and are implementing and sharing, then this would mean this curriculum and pedagogy is one manifestation of what an ecopedagogical educational policy and leadership program can look like. Ecopedagogy has remained a largely theoretical field, though as an extension of critical theory it is rooted in the idea of praxis, it has, to my knowledge, had limited examples of curricular spaces to interrogate what such praxis would look like at granular levels and communal spaces. Misiaszek has several case studies in his dissertation, and there are some others within Latin America, but it remains limited (G. W. Misiaszek 2011). This case study offers an additional opportunity. This would offer a meaningful contribution to educational policy and leadership. As stated in the preface to the literature review, I do not actually include all of these research questions in my next chapter (three) on methods in which I present the two distilled research questions I will investigate. However, I have found a way to incorporate many of these questions. Additionally, as mentioned in the preface, nearly all of these questions show up to some
extent in the findings of the data, so the threads of this cloth remain useful in understanding components of this complex system.

In Chapter Three I will explore in more detail what is involved in this case study, how I will collect data utilizing photo-voice (which was the adaptive change because of Covid-19 and the need to engage in remote data collection with the farmers), and the evaluative method I will use for this data set with narrative (thematic) analysis (which will be explored in detail in the findings in Chapter Four).
Chapter Three: Methods

Introduction:

This chapter will:

- revisit the research questions that emerged from Chapter Two
- the setting I have chosen for my research, and why it is a strong candidate space for interrogating those questions,
- the logic for selecting a specific methodological framework based thereon
- how COVID-19 required modifications to research due to social distancing as well as manners in which I have modified this original proposal to accommodate methods, research, and how this is anticipated to impact findings/analysis
- discuss specific operational procedures available based on those methodological choices to explore my research questions and generate data.

I will also briefly touch upon some alternative methodologies I considered but rejected and why. My focus will be on the actual methods and tools (photo-voice) I have chosen to use and why. The exploration will focus on photo-voice for my methods of collecting data and narrative analysis in order to interpret it - and how I have modified their usage to accommodate the needs during the pandemic.

The Research Questions:

Due to the outbreak of the pandemic, and the limitations associated with remote research, coupled with my realization of the limited capacities of my own energies and scope of this project, I am limiting the research questions outlined in Chapter Two to two questions
that encapsulate the thrust of the spirit of the arc of the rest of the research questions. Much of this was also a consequence of ongoing conversations with both my advisor Dr. Aaron Benavot, my committee member Dr. Kayla Johnson (who has previously conducted a dissertation utilizing the same methods/tools) as well as my extended and talented team both throughout North America among PermEzone and C-MRA (located in Kenya). I will discuss these organizations and their role in more detail in later sections of this chapter. Together we co-created questions that fit within the larger research agenda and made most sense to focus on for this initial research. There was also a lot of discussion about the language to use that could allow for a distillation that may incorporate some of the other questions within them. This is effectively an initial theory of change/action for the logic model of our group, and this dissertations findings will help offer a first iteration to support or negate aspects thereof as they relate to my own research interests around ecopedagogy and public policies intersections with non-formal education.

Arriving at Research Question One

The first research I will explore is the thread of eco-literacy within ecopedagogy and how it impacts participants of the farmer field school on an individual level:

Research Question One (Actual)

RQ1: In what ways does a non-formal ecopedagogy based curriculum cultivate critical consciousness among adult learners?

The research question and the prompt used to interrogate it via photo-voice are not worded in the exact same way. Meaning the way this question will be posed to the farmers as
a prompt for taking photographs coupled with a story about the photo told by the farmers, *is framed in a way in order to explore this research question.* The logic of how this method works will be explained in greater detail later in this chapter. The prompt used for research question one is:

**Prompt One**

*How do you see yourself as a creator in the way you farm and your role in that creation process?*

Arriving at Research Question Two (Actual)

In the second research question I was looking to find a way to weave three different threads together, however only two proved possible as will be discussed.

1. The first critical thread was to explore if consciousness raising *was* found to be occurring on the individual level in research question one, then *does it* lead to a subsequence raise in collective consciousness?

2. A second thread was to explore, if critical consciousness was fostered among individuals through ecopedagogy, as explored in research question one, is ecopedagogy also a *mechanism* of change in cultivating collective action and consciousness?

The third and final thread is utilizing improvement science. Based on the ways in which collective change is occurring, improvement science will offer a way for evaluating such collective consciousness changes.
However due to scope constraints and feasibility of data collection within a research question, I have dropped this third thread, and limited the construction of the research question to the weave of only the first two threads. This research question still focuses on changes at a more communal collective level.

This led to the writing of Research Question Two:

Research Question Two:

RQ2: In what ways is this ecopedagogy curriculum fostering collective change?

As with research question one, the prompt for research question two is worded to interrogate RQ2 in language different than the research question itself. The second prompt was put in this way to the farmers in Asumbi:

Prompt Two

How is change made possible in your community?

Searching for a Research Site

Over these past years as I was seeking a way to embed myself again within East African farming communities and find a meaningful way to re-establish relationships and find suitable candidate communities to work within. Recall from Chapter Two how important trust building and vulnerability are to creating an environment in which reliable data exist and meaningful relationships and PAR can actually occur. Parachuting in as an outsider won't
work, and establishing organic relationships after having spent some time away isn't easy. I began by surveying some of the agricultural landscape within Uganda and Kenya, where I have spent time and had familiarity. I came across the Permaculture Research Institute, where I met Sheena Shah, a talented permaculturist and educator, with whom I still work and who is now part of the team at permEzone. We began working together over nine years ago. Sheena has introduced me to many different groups, people, farmers, and other non-profits, and was the gatekeeper for me. We have published together on data she and other farmers and permaculture teams have collected, in collaboration with other researchers and academics from around the world. Some of the nonprofits we have worked with have folded over the years, others have seen setbacks for the very common reasons that face those in development work, be that embezzling, inability to maintain sustainable infrastructure, over-extension, infighting and so forth. But within that, there have also been bright spots and positive deviants. I knew that such a participatory action research orientation would take years to work and years for us to find candidate institutional spaces and field test sites within which to work. Readiness assessments, organizations saying they want to facilitate change, communities and individuals saying they want to facilitate change, versus those actually demonstrating they are taking actions to do so, are quite different, as any of us who have worked within organizational theory/change are familiar with. We have been met with many frustrations, and have had friction at times, this can be exhausting work. But there is resilience in many of these communities and relationships, and with permEzone and C-MRA we found spaces to deeply explore permaculture curricula within an NFE setting in FFS. I will explain how that came to be in the following paragraphs.

Identifying permEzone and C-MRA as the Curricular and FFS Innovators
Permaculture and farmer field schools are attuned to this, so the first thing we set out to do was to find farmer field schools that were utilizing permaculture curriculum. We (Sheena and I) thought that by combing these two filters we were stacking the deck in our favor a bit. Her contact Hugh Kelly, mentioned below among the core team, had begun an organization called permEzone, which is how I came into contact with this group, was on a similar search – looking to identify farming groups in East Africa that were well poised to take on more entrepreneurial risks and attempt collective action theories of change with deliberation using permaculture as a theory of change for the purpose of an alternative form of development. As permEzone notes, “How can the global permaculture community organize around the idea of putting permaculture at the heart of rural development, displacing the business-as-usual development programs that promote unsustainable farming systems, by making better use of resources that already exist” (permEzone website, taken 3/30/21). As can be read in this quote, the focus is not simply on introducing permaculture as a source of content knowledge for farmers, but rather on using it as a means of disruption to “displace business as usual” for the purpose of an alternative “development program” for rural communities utilizing local “resources that already exist.” Importantly, as I have noted throughout parts of chapters two and three, in order to evaluate theories of action and organizational change, having a clearly thought out initial logic map or theory of change is vital, so that it is possible to consider what is working, for whom, under what conditions, and why. permEzone has an explicit logic model, including a 5-minute presentation of it available via YouTube presented by Hugh at a conference (Hugh Kelly 2019). While like all logic models, it is embraced as imperfect it offers a starting point for iterations of failure/improvement/learning, and indicates that to me that this is a learning organization/culture – which also meant I had good reasons to think not only may this organization help offer networks/inroads with Kenyan farmers working on alternative
theories of development in FFS/NFE utilizing permaculture, but that they were doing so using improvement science and systems thinking. This was nearly identical to the purpose I had set out to explore in my dissertation. It made sense to explore a potential relationship with permEzone, which Hugh and I began to till immediately – and as we became more comfortable with one another, this bore fruit.

permEzone continued it’s cataloguing of FFS/permaculture based groups in Kenya and Uganda and among them identified C-MRA. What set C-MRA apart was, with the help of Sheena, the meeting of their leader - Paul Omollo, a brilliant thinker and gifted leader and permaculture farmer, who was leading several villages and farms in Western Kenya. Paul’s vision is to create resilient rural communities rooted in systems separated from classical capitalist development. He formed with the help of others an organization called Community Mobilization for Regenerative Agriculture (C-MRA). Finding an FFS/permaculture organization in Kenya is not particularly difficult, there are literally thousands of FFS in Kenya. However, finding an FFS in Kenya with a leader that is willing to be:

- transparent
- admit to failure\(^{39}\)
- navigate gender dynamics
- work for equity
- facilitate more vulnerable spaces
- increase risk taking profiles\(^{40}\)

\(^{39}\) with Western/Northern leadership where there are asymmetrical power dynamics and often deep (and well founded) fears of loss of funding as well as admonishment

\(^{40}\) (recall Hugh was seeking entrepreneurial spaces as part of this theory of change within a permaculture theory of development model)
is exceptionally difficult. We all believed that Paul was our person.\footnote{Ensuring that Paul would in turn learn how to develop additional leadership and distribute/de-centralize and democratize such leadership and power is an additional hurdle that we have still not crossed. Paul is entirely open and genuinely wanting to engage in this, but as those in development know, leadership training is difficult and this is a capacity and training dynamic we are our selves still learning how to do well. I would argue what remains distinctive even in this shortcoming is the willingness to acknowledge the shortcoming, a humbleness and humility and a willingness to, as Nancy Zimpher loves to remind us “fail forward” – otherwise we are not living in a learning organization, and this is what we have too often witnessed in such work and what our major fear was in our search for the “right” partner. It is why we continue to have faith in Paul as a leader who can enact his vision and bring on additional leadership to create this shared vision through iterations of failure and learning.} C-MRA was our first primary partner organization in Kenya, with Paul as our primary contact and trainer, and thus was born the partnerships that would be the bedrock for this dissertation. Hugh invited me to be a member of their monitoring and evaluation team. Below I will explain in a little more detail what led me to think that these were good risks to take. I was risking the ability to complete my dissertation and nearly a decade of work on this relationship and the viability of this study, and had already seen multiple other FFS and non-profits collapse in this timeframe, which needless to say, made me quite nervous and anxious.

As mentioned in Section Six of Chapter Two, C-MRA, and permEzone are engaged with two sites that have clear potential for a Networked Improvement Community (NIC) that is already emergent, if not in full blown existence (since writing this, it has grown to three sites, and they have expanded to a site in Uganda as well). They are also now building a relationship with LEDI in Southern Kenya. It also makes the feasibility of a comparative case steady downstream as part of a future research agenda a likely future goal. But beyond this, the reason that permEzone and C-MRA are engaged in forming a NIC is a problem of practice. The problem of practice in this case is how to create more ecologically and socially resilient rural communities, particularly in the face of climate change/mass extinction, utilizing permaculture as an alternative development theory. This makes the curriculum they intend to deliver a critically literate curriculum for ecology, which would make it an
ecopedagogical curriculum that can be interrogated to better understand this educational policy and leadership possibilities.

The ways in which this hypothesis is being tested is through use of a modified farmer field school (FFS) design with a permaculture curricular basis, that is, at least potentially, rich in its ecopedagogical design and content. This means it may have more socio-historical content, and critical theory lenses – as opposed to just technical literacy. Evidence for this can be seen in the intertwining of social and ecological issues, which C-MRA is very clear about, and the taking on of complex systems problems in their approach to local solutions. It is for this reason that I am hopeful that the RQs will be viable to interrogate.

As C-MRA puts it:

C-MRA was founded...to produce enough food and solve food security and climate change menace that has hit the region. The organization teaches farmers’ agricultural production using systems of farming that reverse the loss of biodiversity, enrich soils, store carbon, restore watershed health, and increase ecosystem services, while eliminating the release of toxins and pollutants….we draw from decades of scientific and applied research…including organic farming, permaculture, agroecology, ecological restoration, and agroforestry” (C-MRA Facebook Page – About Section - Retrieved July 26 2020)

C-MRA is an educational-agricultural organization that takes a more nuanced and complicated approach to what farmers and adult literacy programs should be including in curriculum. This makes it a bit more promising that my RQs that incorporate components alternative development theories will be addressed by such organizations that don’t shy away from the political nature such contested content in their curriculum. How this manifests in an eco-pedagogical curriculum framework around permaculture which may raise more consciousness around political issues such as gender is what we are excited to explore. Certainly a critical theory informed literacy program should be more attentive to such elements. This evaluative study will seek to determine the degree to which this is/n’t in fact the case.
Highlighting some of the research groups backgrounds and capacities will also speak to why this specific field site and the people involved in them, are such promising arenas for this work and the weaving of the threads I have explored in the literatures to generate my research questions. I will focus specifically on the leadership and content backgrounds of members of this wider research team involved in running the FFS site next to demonstrate this.

Composition of Research Team

Our monitoring and evaluation team has worked together to coordinate and conduct this research. It is comprised of a heterogeneous group comprised of both local (Kenyan – primarily Luo) as well as outsider (US and UK) researchers, fundraisers, artists, and high-tech professionals. Initially we were going to have teams that would have been comprised of at least one foreign researcher and one local to engage in the site visits. However due to COVID this will be impossible, so the site visits will be conducted exclusively by locally trained permaculture trainers and farm managers and leadership who are Kenyan. Nevertheless this will allow for the teams to “compare explicitly their methodological styles and learn from one another” (Bartlett and Vavrus 2014, p. 138) via Zoom sharing of our observations using photo-voice and narrative analysis. Likewise, this allows us to take advantage of the linguistic and cultural knowledge of the local Kenyan researchers differences (the geographical and cultural differences across Kenya are significant, as noted earlier), while also utilizing the “outsider status” of the U.S. or U.K. researchers on the team (even if it is from distance, we are in nearly daily contact) to “notice things others would take for granted” (Ibid.).

Our Core Research Team
Hugh is a facilitator, project manager and Chartered IT Professional (UK), who has delivered projects in the for-profit, non-profit and public sectors. Having designed, developed and managed systems for retail, wholesale and commodity trading businesses, he moved on to run a non-profit supporting people at the end of life, worked as a project manager and researcher at Friends of the Earth, and delivered an experimental service for the UK government to improve workplace health. He studied International Development Management at the Open University in the UK, before moving to California where he trained in permaculture, and now volunteers as President of Mesa Harmony Garden, a volunteer-run community food forest supplying the local Food Bank, and as a Master Gardener. He also served on the leadership team of the Santa Barbara Food Alliance.

Sheena Shah - Born and raised in Nairobi, Sheena taught in schools before joining the PRI Kenya in 2012 to manage their Executive Education Program, with more than 6,500 people trained in Permaculture Design and three International Training of Trainers certified courses. She was Executive Director from 2016 to 2018, responsible for overall management, field operations, program delivery, partnerships and communications. Sheena is now an independent consultant and Founder of Harvesting For Good, East Africa with its aim in turning micro and macro landscapes to regenerative eco-spaces. Sheena continues her focus on regenerative business, using solutions and principles to level up and ensure long-term sustainable development to shift the paradigm in small-scale projects and markets. She sits on the Board of permEzone overlooking field projects, curriculum and network development. Sheena has also begun the Graduate Certificate Program for Executive Program in Social Impact Strategy at UPenn, where she is studying.
many of the concepts discussed in this dissertation such as the wicked problem, adaptive leadership, and improvement science.

Paul Omolo is C-MRA’s representative for Phase 1 of the permEzone pilot program in Asumbi county, and will be a key member of the MEL team for research and data collection in the field. Paul has a BSc in Horticulture from Moi University, Eldoret and has successfully completed a Professional Certification Course in Program Monitoring and Evaluation with The Kenya Institute of Management. He took his Permaculture Design Certification (PDC) course in Laikipia Permaculture Centre. Previously, as a member of the Permaculture Research Institute, Kenya’s projects team, he worked for the USAID Kenya Horticulture Competitiveness project, initially as a Field Agronomist and then as Project Coordinator in Migori County. He has also worked as a Field Assistant (Horticulture) at Sauri Millennium Village, and as a Sales Agronomist for East African Seed Company.

Reagan Okoth is the Field Extension and Research officer for the permEzone Pilot Program. He grew up in Asumbi, and his understanding of the people, language, and culture underpins his commitment to see communities bridging together to develop sustainable working models. Currently pursuing a Master of Science in Environmental Planning and Management at Kenyatta University, he holds a Bachelor of Science Degree in Coastal and Marine Resource Management, and took his Permaculture Design Certification course in Drylands Natural
Resource Centre. His prior experience includes working as a research assistant with Kenya Marine and Fisheries Research Institute on Mikoko Pamoja, a community carbon offset project in Kwale County, and as a project intern with University of Helsinki’s Taita research Station implementing the Adaptation for Ecosystem Resilience in Africa project.

**Elin Duby:** Elin is a development consultant, who previously served as Director of the Permaculture Research Institute, Kenya. She studied at the University of Sussex and the Institute of Development Studies (IDS), trained in Permaculture in the UK and did her teacher training with Rosemary Morrow in Malawi. Her skill-set includes strategic planning, organizational development and project development for grassroots development projects; research on natural resource management, resilient food systems, food sovereignty, gender and women’s empowerment and facilitation of trainings and strategic planning workshops. Elin has recently co-facilitated Resilience Design trainings and Permagarden trainings in Uganda, Niger and Nepal.

**Georgina McAllister, PhD** is co-founder and Programs Director at UK non-profit Garden Africa. Her experience spans both humanitarian and development sectors in Europe, the Middle East, South East Asia, Pacific and sub-Saharan Africa. With a BA Hons in Peace Studies and a Masters in Post-War Reconstruction & Development, she is currently undertaking PhD research in Zimbabwe (under the Centre for Agroecology, Water & Resilience at Coventry University), exploring the extent to which agroecology, with its emphasis on strengthening knowledge and social networks for collective natural resource management, builds cohesion and trust as articulated through farmers' everyday experiences. George is interested in creating more inclusive and sustainable forms of community engagement which view environmental regeneration as part of the long-term solution, and in developing innovative plant-based
livelihoods approaches which stimulate localized economic opportunity while navigating eco-social change.

With this field site in mind, the leadership team’s biographies described, and a sense of the organizational culture I am working within, I will now turn to a consideration of some methods I considered but have chosen not to use (and why) and then delve into the method I am using – photo-voice. I will then explain how I will interpret this data, using narrative analysis before concluding this chapter.

The Setting – Asumbi Village as a Research Site & the Luo People

Based on these research questions I have selected a specific site, Asumbi Village in Kenya for my study. This has changed quite a bit from the original plan due to COVID as I explained earlier and will revisit again in this chapter to orient the reader. I will discuss some of the backgrounds of this village, demographics, and wider national/regional contexts, and then explain why I think that Asumbi provides a strong candidate site to answer the research questions I have posed in my literature review.

The Settings: Asumbi Village (Homa Bay County), Kenya

The village where the program is being conducted in Western Kenya is in the Homa Bay County, on the northeastern banks of Lake Victoria. The people are entirely comprised of the Luo. Paul Hebinck and Nelson Mango in their chapter about conflict and land in Loueland in Western Kenya wrote that “people’s relationships to land are in Kenya inherently contradictory, conflictive, and confusing at the same time” (Abbink et al. 2008, p. 39). They note such tensions of identity may in part derive from national level policies which
have sought to diminish land-based conflicts. Much of these conflicts were viewed by the government as derived from conflict around privatization of public lands, or land grabs which often were seen to derive from a system of political patronage around land giving. However much of these national policy reforms ignored local custom and Luo cultural relationships and philosophical orientations to land.

In this next section I will:

1. Briefly explore some cultural aspects of who the Luo are (all the farmers with whom I will be working are Luo)
2. discuss gendered structures of typical Luo governance and as it relates to Luo patriarchy, land division, and agricultural responsibilities
3. consider Hebinch and Mango’s critique in light of the above, in which they acknowledge contested identities and the implications this has for research and practice
4. note why such intersectional complications require sensitivity when approaching research and data collection

There are histories to ideas around relationships to land, gendered components, political identity, cultural attitudes, and colonial histories. I won’t be able to touch or go into detail on all of these, nor do I have expert knowledge on all of them. However, it is important I stay humble and mindful, particularly given the critical theory frame working I am using, that these research questions are not politically neutral, and my own positionality, how I ask them, and the kinds of relationships that are or are not created all have impact on our quality of data, and the ways in which I may end up expressing an analysis of their stories more or less accurately. This methodology is meant to raise others voices, and elicit their stories. My
ability to listen, gain their trust, solicit personal stories, and be able to reasonably accurately retell their stories is critical. Given that the exploration of the research is also rooted in farmers who have gone through a permaculture curriculum in a NFE FFS conducted by Paul Omollo and Reagan Okoth, the nature in which they approached this is also of significance. Did the farmers trust them? To what extent was the curriculum implemented with fidelity that was rooted in trust/vulnerability/risk taking that was in part due to their positionality, politics, and a nuanced understanding of many of the relationships mentioned in this paragraph as it relates to for example, gender or land? I will now touch on some of the cultural attributes writ large of the Luo, bearing in mind there are wide variations within such an identity.

1. The Luo – A Brief Introduction

In Kenya, all the Luo farmers participating in the project are from the ethnic group called Nilotes. The Luo are the fourth largest ethnic group in Kenya at 11%, following the Kikuyu (18%), Luhya (14%), and the Kalenjin (12%) (KNBS 2010, p. 397-398). The population of Luo is estimated to be 3.4 million in 2010 according to the government census. However, this number excluded the Suba, whom many Luo still consider to be members of their own group (and who numbered 300,000 at the time). Current estimates place the Luo population at over 6 million in Kenya. Homa Bay is home to approximately 45,000 people.42

Unlike other members of the linguistic Luo group, the ethnic members of the Luo of Kenya and Tanzania are members of the river lake Nilotes – who are indigenous to the Nile River Valley for thousands of years.

42 https://www.knbs.or.ke/?wpdnipro=2019-kenya-population-and-housing-census-volume-ii-distribution-of-population-by-administrative-units&wpdmdl=5728&ind=MT12f0IDWVM-a0f2dc3Xi42qelbruMwR0a7XIwb0iAwnedEVN Bj_d_1FEwMun_eI5
Today many Luo’s follow Christianity, and so traditions have evolved and changed. Marriage is common outside of the group, and what counts as “traditional” depends on the religious identities of the specific Luo family involved. A marriage ceremony today may often involve a Church ceremony. Most still involve a bride-price paid by the groom to the bride’s family.

Music was and continues to be a central component of Luo culture. From percussion to string and wind instruments, there have been a variety of sounds involved in Luo music. The songs are typically involved in ritual components of life, celebrating major ceremonies such as welcoming back the fighters from war, courtship, songs for work involving agriculture, songs of divination and about nature beseeching the rain and weather on whom the Luo as farmers and pastoralists depended for survival. This demonstrates aspects of ancestral indigenous spiritual roots that predate the Christian roots and show ways in which there are intersectional identities that have merged.

Modern Politics and the Luo

Modern political identity has influenced the ancient Luo People. It is widely regarded that in Kenya there is an increasing “context of ethnicized politics and politicized ethnicity” (Akoth 2017, p. 195). This is in part due to the fact that 2010 was “the year of Kenya’s constitutional moment” (Ibid.) which led to many groups repositioning themselves in how they would negotiate with the state, modernity, neo-colonialism, and fight for their communities resources (Hodgson 2011). Part of what led to the Luo community organizing in more open manners, was the political loss of Raila Odinga (a Luo) in the 2007 elections. The loss was seen as a reflection by successful use of violent rhetoric by a segment of Kenya’s
political elite to the effect of ‘a Luo is not good enough to lead’ (and note, this rhetoric was being used against a minority group within the nation). The election of President Obama in the United States, who has Luo heritage from his father, played an important role for Luo back in Kenya in organizing themselves culturally in response to these attacks and the loss of what they felt was a stolen election in 2007 (S. Akoth 2010; 2015). To this day, elections in Kenya have a resonance of, if not fear, anxiety, as there is disruption to daily life with this kind of rhetoric and maneuvering that more mirrors what for example we have seen in the United States in recent years, a tribalism. As the reader may recall from the popular press, President ObEmily Oslo was much heralded back in Kenya, and this is the cultural and historical context for that moment – it gave pride in identity to a group who had just suffered public rhetorical ethnic attacks and humiliations to ensure a political loss in Kenya as a minority group. That Americans with all their racist history elected “a Black man” with Luo heritage had a particular resonance for Luo back in Kenya who had been told at the same moment that "they weren’t good enough" for political leadership.

Citing such examples, Akoth notes that thinkers from across the African continent have critically interpreted how groups such as the Luo are creating their broader postcolonial identities. Meaning, the Luo are now in a position as they negotiate their identities vis-à-vis the state, both regarding what claims they make of it, and how they begin to try and delineate aspects of power and voice considering their ancient history, culture, and ways of engaging with modernity, capitalism, and the multiplicity of tensions and contradictions that arise with these multitudes of identities (Fanon 1990; Imbo 2002; Stubbs 1987).

43 If a Luo was good enough to lead in the USA, then they must be good enough to lead in Kenya as well! This kind of messaging was made explicit and used throughout such cultural events, as Akoth and other anthropologists have noted in their research – see references in paragraph above for examples.
Luo Patriarchy, Land Division, and Agricultural Responsibilities

Land division remains a major contributing factor to the challenging problems of agriculture in East Africa. This is compounded in part by Luo patriarchal practices of land division, which reward gender, specifically being a male. I will return to this in Chapter Five, and manners in which exposure to the ecopedagogical permaculture curriculum may have influenced this. As Ocholla Ayayo has noted, “When the time of the inheritance comes the ideology of seniority is respected: the elder son receives the largest share, followed in the order of seniority” (assuming one is, of course, also a male) (Ocholla-Ayayo 1976). The Luo have specific customs for how these divisions take place – based on directionality (“to the right or left of the homestead” is the language used).

These divisions of land and “responsibility of leadership” go hand in hand, and run so deep that they form the backbone for how genealogies are grouped. The Dhuluo word (the language of the Luo) for people of the same grandfather (and thus of the same land inheritance) are called Jokakwaro. As Ayayo notes, “they share sacrifices under the leadership of the senior brother” (1976). Attached to these responsibilities are also multiple agricultural responsibilities around harvesting and cultivation that are tied to the access of the land. “Women have also encountered opposition when they tried to bequeath farms to their daughters, even when the farms in question were their personal property” (Berry 1993, p. 156). If women can’t expect equitable access to land/resources, then trying to achieve a buy-in for long term generational planning is more difficult as there is an obvious lack in incentive since they are left out of decision making in resource allocation. This is a design systems problem, but not one I will be able to tackle in this dissertation as initially hoped.
Within Asumbi, the above observations do not necessarily seem to hold, which is noteworthy. Approximately half the farmers I am working with are women, and seem to be amongst the most radical reformers and leaders of the group, which contradicts some of these assumptions/intuitions of earlier scholars – so I will attempt to probe some of these dynamics, even if it is to just capture data to be used later via the focus group interviews. It is also possible that a different gendered dynamic exists among the farmers I am working with due to consciousness raising that has occurred, or perhaps due to generational shifts. I will return to these ideas in my fifth chapter. I’m sure other possibilities I have not considered exist as well. Particularly I am concerned that Northern epistemological representations of Luo patriarchy and land are simply inaccurate or oversimplified, much of the scholarship on these topics are written by outsiders for example, there is very limited scholarship on this written by Luo or even East African scholars. When I wrote this I was unsure how much I would be able to explore this topic, with the hope of being able to interview some of the farmers and teachers of the curriculum about it. It turned out this was indeed possible, particularly based on the results of the photo-voice data and what farmers had to say about the research questions, and I have preliminary findings and analysis to offer on these ideas which are touched on in chapter five.

The typical division of land among Luo works similarly if the division is based on monogamous or polygamous villages, excepting that in a polygamous village all the sons of the senior mother are divided amongst them as if equivalent to the senior son of a monogamous division, and all the sons of the second most senior mother equivalent to the second most senior son of a monogamous division, and so on (Ocholla-Ayayo 1976). Among the Asumbi farmers there are no polygamous relationships within families, however this is still known as a culturally acceptable/normed practice in villages nearby. It is unclear what forces caused this change within Asumbi.
With the introduction of colonialism and British laws, particularly as related to privatization and private property, many of these traditional laws and property rights were suddenly challenged with alternative legal frameworks. Colonial officials sanctioned the theft of land by European settlers and “imposed fixed administrative boundaries on highly fluid and mobile communities” (Berry 1993, p. 9). This created what Von Brenda-Beckmann calls the “co-existence of law or legal orders” (Brenda-Beckmann 2002, p. 39). Or as Berry put it, “since independence, both property rights and political spheres of influence have remained contested and flexible” (Ibid.). Multiple legal systems have uncomfortably co-existed, ancient traditional land systems, and the modern colonial systems. Inevitable conflict awaited. The previous order and rituals didn’t just disappear – they were folded in. Hebinck and Mango argue that it is within such a “co-existence” of legal orders that contested usages of tradition are being weaponized in order to leverage political control and control over resources. They specifically cite Channock who speaks about how customs can be used in such settings “as a weapon in the battle against others” (Chanock 1991, p. 97) by “accentuating a narrower version” (Ibid.).

I must be attentive to this gendered aspect considering the disproportionate role that women play in the actual farming of the land, yet their exclusion from such customs of traditional Luo ownership, and particularly from such customs in the contested landscape that Hebinch and Mango draw attention to. As will be noted later on in the methods around photo-voice, this methodology is particularly well suited to help address this concern, both around power structures, and around the ability of women to “speak back” and ensure that their stories and experiences are heard and present in the dialogue. **Photo-voice creates a space for their characters (literally) and for them to tell stories with contradictions, tensions,**
and explore how such tensions are resolved internally in their minds. This aspect of narrative analysis will be more fully explored in Chapter 4. Anthropologists have long argued that “African land tenure is not about ownership per se, but instead rights and social obligations” (Abbink et al. 2008, p. 41; See Also: Chanock 1991; Shipton 1994; Lund 2002). Such obligations include many specific agricultural components, tied to this genealogical lineage, such as who has the rights of first harvesting (dwoko cham) and first sowing (golo kodhi).

As Hebinck and Mango note:

The paper has also shown inter alia that women do not normally inherit cultivation rights but acquire them mainly through marriage. Women’s rights are only ancillary, depending on allocations from their husbands. Their position regarding land can also be seen from the angle of matrilineal relationships in a patrilineal society. Women are the ones who work the land most of the time, and obtain rights in their post-marital homesteads by devolution from their mothers-in-law. (2008, p. 58).

4. Contested Intersectional Identities – The Sensitivity This Requires in My Approach

What possible ramifications may this have for whom participates? For the ways in which gender influences the risks that people do/n’t take in public meetings where allocation of resources, land, and agricultural decisions are made, and determines whose voices are represented in disagreements, tensions, etc.? What roles are institutions like the Church (given the majority Christian population) or the Mosque (given the 15% Muslim minority) playing in reproducing such structures (if any)? Add to this that embracing failure and cultivating vulnerability (both discussed previously in Section Six of Chapter Two) are key cultural components of improvement science, yet also require a fairly high-risk profile, as does entrepreneurial enterprising. If gender is a discriminating variable, as seems likely, and is impacting risk profile (women have a lower risk profile because they are risking more when they speak out in such gendered spaces), then it is rippling across several important
variables at once. It should also be within this context that challenging such legal, political, and social norms is fully appreciated and understood. This is a wicked problem.

So what may seem like a seemingly simple/tame problem -- legally empowering women to ensure they have equitable legal access to land rights, and thus help solve the entangled problems that have occurred (environmental degradation due to lack of concern by women working the land who don’t own it) -- is naïve, at best. Given the entangled manners in which kinship and social obligations are tied to land rights, addressing the legal components of women’s rights requires addressing much more than just this one aspect of power. This seems like a space that absolutely requires local experts, of a wide and diverse stakeholder composition, to navigate carefully to ensure that what are perceived as net benefits and gains for “the people” don’t end up resulting in blowbacks. Particularly considering the marginalized spaces that many of those who are at the mercy of such changes already occupy within the society.

Frameworks Considered but Jettisoned

The Comparative Case Study

It was initially hoped that this dissertation could provide a comparative case study. However due to COVID and a drop in funding, coupled with extreme difficulties with on-site field work as a consequence for non-Kenyan citizens (and even then, difficult), our collaboration with LEDI (located in Southern Kenya) proved to be implausible in the timeframe allotted. As a result, the comparative case study for this dissertation will not materialize. The idea of utilizing the site with BEU which would have meant working across
the international border with Uganda in the pandemic environment was not feasible for this doctorate given the timeline we had available. However, our team still plans to ultimately engage in such a study as part of my/our research agenda. For this reason, I will still explain the merits of the comparative case study, as the data I am collecting for the first site will ultimately be used as part of such a research agenda in the future for this comparative case study. Many of the merits described below will also hold true for the singular case study framework I utilize, within the exploration of the photo-voice method of narrative analysis.

For the purpose of program evaluation, Vogt et al. seek to determine if a methodology, aside from randomized control trials (RCT), could be used that would both focus on the processes of the program (as ethnographies and other qualitative studies often do) and could offer a scientifically based research approach for determining differential outcomes to improve programs. It is in this regard that a comparative case study is considered as providing a framework in which, even in a small N comparison, “a wider range of research questions” (Ibid, p. 300). While it is contested, they argue that it is within a

44 Vogt, Gardner, Haefele, & Baker, in a sharply critical paper discuss how the golden standard of randomized control trials (RCT) is inappropriate as a golden standard, as the “choice of design should be driven by the research question, the context in which one is trying to answer it, and the objects of research” (W. P. Vogt et al. 2012, p. 294). They note five conditions under which RCTs are likely inappropriate as the best choice for method, and under which a comparative case study can be a stronger methodological framework. Those five conditions are:

1. When subjects cannot be randomly assigned
2. When key variables cannot be manipulated (such as gender, race, class)
3. When RCTs are not cost effective compared to other methods
4. When RCTs have limited external validity (e.g. due to external funding, grants, etc.)
5. When RCT would distort object of study (such as partnerships that can’t be randomly assigned) (Vogt et al. 2012)

Certainly criteria 1, 2, and 4 apply here, and quite possibly 3 and 5. Regardless the other three would rule out the feasibility of an RCT and point to the need for intelligently considered alternative frameworks. The importance of socio-economic status, educational status, and gender in this study make items 1 and 2 impossible and unethical if we were to segregate people. And due to the external funding, we have a problem with item number 4 as well, “Another area of limited external validity comes in programs funded by external grants that have eligibility and selection criteria that preclude random assignment. To be eligible a community or an institution such as a hospital or a university might have to provide matching funds. Thus, only communities with sufficient resources or institutions with enthusiastic managements might qualify. It would be hard to generalize from such groups of enthusiastic volunteers to a more general population of communities or institutions. Limitations on external validity are hardly confined to evaluation of social programs” (W. P. Vogt et al. 2012, p. 298). The mere access of Asumbi and Sanje Villages to such external funding and support sets them apart from many of their, otherwise comparable, peer neighbors, and makes external validity tricky to tease apart.
reasonable and plausible realm that when such studies are done well, that a comparative case study can be used for making generalizations of claims (Vogt et al. 2012). What is required by those who argue for this is that the cases share important common attributes (Caramani 2009), which Asumbi, Kenya and LEDI in Southern Kenya do, which would increase the value of this study (if the findings are more generalizable).

What is often viewed as the primary purpose of such comparative case studies, is the testing of theory, or a theory of action/change, so that both process and outcomes are being given attention by the researcher. “In comparative case study program evaluation, the individual case study is instrumental in seeking broader knowledge” (W. P. Vogt et al. 2012, p. 314). But just like in improvement science, where what matters is the variation, what is working, for whom, under what conditions, so too here in the comparative case study, “This is not to dispute that the ways the general conclusions might vary in specific contexts is crucial information. It indicates how a generalization might be applied” (Ibid.). This would allow us to both improve upon the program, create targeted interventions for improvement, and conduct further research on these iterations to unearth what is working well (or failing) and why, in order to improve policy and programming. Such a shift in frameworks is what UNESCO’s Mahatma Gandhi Institute of Education for Peace and Sustainability (MGIEP) has called for as well if we are to have successful educational policy around climate action – calling for a shift to the inputs and continuous forms of evaluation, instead of summative assessments and a focus on metric based outcomes (MGIEP 2019). As will be shown in Chapter Five – given the continuous evaluation models that were implemented to some degree in Asumbi, once a comparative case study is conducted after this dissertation, there is encouraging (but one must be cautionary still) reasons to believe that these data sets findings are indicative of such generalizability.
The importance of the improvement science framework (See Chapter Two Section Six) and the adoption of explicit and agreed upon theory of changes by those involved in the work in Asumbi is critical. Much of this form of evaluation through comparative case study is through a theoretical lens. The theories of action/change (Chapter Two, Section Six) are linked to specific intended outcomes (H. T. Chen 1994; H.-T. Chen and Rossi 1987). As noted, permEzone has a testable explicit theory of action, which was part of my attraction to working with this team. When there is no agreed upon theory of change then project success and evaluating for the purpose of improvement via the causal links for evaluation becomes much more difficult (Hatch 1998 - See also Chapter Two, Section Six). “If the theories of change do not adequately and reasonably connect intended results with project interventions, the opportunity to study change mechanisms through evaluation is lost” (Vogt et al. 2012; Weiss 2000; Rogers and Weiss 2007; Wholey 2004). So too is the ability to focus on inputs and use more formative assessments as stressed by MGIEP (2019). Independent of the comparative case study component, meaning even just within a singular case study since I have lost the ability to engage with BEU/LEDI for now, the aspects discussed in many of the above paragraphs around the logic involved around theories of change remain intact for my study and relevant/beneficial to this dissertation.

Vogt offers this table, which I have slightly modified, as a comparison of typical comparative research vs typical applied research evaluation:

<table>
<thead>
<tr>
<th></th>
<th>Typical comparative research</th>
<th>Typical applied program evaluation research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case selection</td>
<td>Selected by researchers for theoretical purposes; often defined by an outcome or dependent variable</td>
<td>Generally selected by granting agencies; often a group of projects funded from the same source</td>
</tr>
<tr>
<td>Time frame for research projects</td>
<td>Set by researchers; may extend over years or decades</td>
<td>Often set by funding agencies; often short turn around</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Temporal design</td>
<td>Usually retrospective</td>
<td>May be retrospective but are often prospective as well</td>
</tr>
<tr>
<td>Data Collection</td>
<td>Multiple sources; often mainly archival or documentary research</td>
<td>Multiple sources; sometimes supplemented with (participant) observation</td>
</tr>
</tbody>
</table>

Table 1: Applied Comparative Evaluations vs. Typical Applied Program Evaluation Research

As you can see from this table, all of the criteria noted for how an applied program evaluation differs from a typical comparative lens apply to this case. The case selection of Asumbi is a function of the project being put in place by permEzone and C-MRA, the time frame is at least partially dictated by their needs and timeline for the programs dates (See Chapter One Introduction). It is for these reasons and my own feasibility/constraints linked to the pandemic that I will use the case study.

I will next explain the case study consideration and why I have chosen this, and thereafter explore the methodology of photo-voice that I will be using to interrogate my case study and research questions.

Dissertation Methodology: The Case Study

Merriam gives a very intriguing definition of the case study. She notes that case studies are an attempt to understand a group, much like an ethnography, but that one of the things that distinguishes them as a qualitative methodology is, they represent a “bounded system.” That the unit of analysis is that bounded system. Merriam defines this boundedness
as a case where there is a limit to the number of people involved who could be interviewed or a finite amount of time for observation. If there is no end (actually or theoretically) to the number of people who could be interviewed or to observations that could be conducted, then the phenomena is not bounded enough to be a case” (Merriam 1998, p. 27-28). Given that I am now limiting myself to the village of Asumbi, with a finite number of farmers involved in the area, and an even more fixed number involved in the study, this meets such a definition. As will be seen later in this chapter, the methodology/tool of photo-voice used to interrogate the research questions is also bounded in the amount of time it is used for to capture data.

Case studies offer a broad framework for a methodology are usually considered to not rely “on one qualitative method” for data collection but rather “multiple techniques including interviews, observations, and at times, the examination of documents and artifacts are employed” (Lodico, Spaulding, and Voegtle 2006, p. 269). My study will be somewhat innovative in utilizing photo-voice via remote forms of data-capture to adapt to the pandemic.

45 There are other scholastic definitions of a case study. Paritucularly noteworthy are Yin (2017) – however as Crotty notes – Yin takes a very positivistic approach (Crotty 1998). Meaning Yin believes epistemologically that there is a linear progression to “objectivity” and truth. This entire dissertation is rooted in a critical theory, decononal space, that rejects positivism. I do not think that the only pathway to generalizability and validity of results is through positivism, in point of fact, I think that the positivist worldview is colonized and committing what Andreotti refers to as epistemicide, and is why even many forms of qualitative research work so hard to prove that are rigorous in the ways that quantitative research are – instead of embracing narrative. Yin himself suggestions something similar stating “regardless of whether one favors qualitative or quantitative research, there is a strong and essential common ground between the two” (Yin, 2002, p. 15) and goes on to emphasis the need for four forms of validity – which are all akin to the kinds of data/design and ‘gold standard’ one seeks epistemologically in positivist traditions. I don't share this epistemological standpoint, and this dissertation is grounded in thinking that not only rejects it, but finds it dangerous. Stake on the other hand embraces a an explicitly constructivist approach “most contemporary qualitative researchers hold that knowledge is constructed rather than discovered” (Stake 1995, p. 99). Stake notes that how a case study and qualitative research is designed and interpreted has much to do with our own notions of reality and knowledge (Ibid.). This certainly aligns well also with my frameworks and I would be comfortable using Stake's definition as well. Merriam, like Stake, states that there is no objective truth, and that reality is “constructed by individuals interacting with their social worlds” (Merriam 1998, p. 6). However since Merriam layers the two, both my (the researcher's) interpretation of reality, with the subjects – this seems most in line with the nature of a critical theory positioned epistemology – one that takes into account positionality (my orientation) and also broad epistemologies (ecopedagogies) and how the subjects are interpreting their world. As Merriam states, “The researcher brings a construction of reality to the research situation, which interacts with other people's constructions or interpretations of the phenomenon being studied. The final product of this type of study is yet another interpretation by the researcher of others' views filtered through his or her own” (Merriam, 1998, p. 22). This seems most in line with my own epistemological outlook for how this dissertation is constructed and the methods employed, so I am working with Merriam's definition. That being said, I think Stake would have worked well also.
while creating an ability to go “beyond engagement” (Mitchel et. al, p. 655) with participants in a manner that ensures their voices and understandings of the systems that impact them. This data will in turn be utilized within focus groups (also explained more fully below) as cues for understanding the emergent themes, consciousness, and potential forms of collective action that villagers experience in this process. I will explore these ideas in more detail later in this chapter. Case studies are recommended for qualitative researchers who “are conducting a study that gets you close to a particular group, program….” (Lodico, Spaulding, and Voegtle 2006, p. 270) – which is exactly what I am doing with my current research project with C-MRA/permEzone and their utilizing of a permaculture curriculum with adult learners within an FFS.

Limitations of the Case Study Framework

The reason I initially wanted to engage in a comparative case study was that it would offer greater insight and generalizability into our findings. Whether I found commonalities or differences, it would shed light on the validity and veracity of the emergent themes, offer opportunities for new questions to pose to the villagers, and potential new educational and agricultural policy directions to consider. It offers potentially more generalizability. I still intend to pursue such studies after my doctorate as part of my research agenda in collaboration with this team. Our research team is continuing to build the bridge with this other organization (LEDI) to prepare such a program and study with an eye to the future. But for the purposes of this dissertation, it will focus on the case study of Asumbi Village utilizing photo voice to explore the impacts of consciousness raising and collective action that permaculture/curriculum within FFS have.
Limitations of the Participatory Action Research Model

Another major component of this design that needs to be remembered—especially as it related to potential limitations, is the participatory nature of the research. Given my own complicated set of relationships with the organizations and members of much of this research, there is a stronger possibility for bias. I want this to work—and I'm not apologetic about that. In accordance with Freire and other critical theorists, I'd argue that research and pedagogy are never politically neutral, and those who are often feigning neutrality where there outcomes are concerned are potentially being less than transparent. We care about a research topic because it isn't only usually interesting, but something that matters to us.

Given that I have disclosed this, how does the PAR impact the limitations of the study? I have argued throughout the paper, and will continue to do so, that PAR is a necessary framework for ethical research, and that it dramatically increases the validity and rigor of data that will be offered as a consequence of trust and vulnerability. That being said, how do I know that the farmers won't just say what they think I'm hoping to hear out of some misguided sense of loyalty? Or that they will be hesitant to disappoint Paul for the same reason? To the degree possible we have sought to safeguard against our own bias, and the potential bias of the data being shared with us by:

Utilizing member checks in the data set

We do this by having frequent check backs with the participants when interpreting a photo or quote is particularly difficult. There were several ways we did this. Upon the first ten days of data collection we paused and had the entire group convene to check in about the data set and had a conversation to check in about understandings around the prompts, and our understandings of the data. This revealed there were some very large misunderstandings—for example about what was/n't allowed to be included within the interpretation on their end for
"creator". They hadn't yet felt empowered enough to completely run with creating the story as the researcher/photo-journalist. Once this was made more clear, different stories emerged.

It also became clear that at first Paul was often translating in ways that were highly interpretive, and I was able to figure this out after having a longer conversation with the group. We then had to make it more clear that the translations had to be as transparent as possible, absent any interpretation, but instead just descriptive. That we would interpret later, and in light of many factors (and then member check). But that we couldn't begin with an interpreted translation. By having conducted member checks we were able to avoid such fundamental mistakes in the data set from creeping in from the beginning as foundational errors. It also led to many participants expanding upon their audios – when they thought an idea may be a little unclear, since they knew we would do a member check if it was unclear – they now often expanded pre-emptively – explaining in a bit more detail what they meant.

Peer Checks

We check in with one another frequently. Be that myself, Paul, Sheenah, Hugh or others. We do our best to call each other to task and help ensure we are avoiding blind spots. We also make use of external relationships with colleagues in related fields who on occasion will come in for pieces of consulting work with the organizations, and can offer evaluative feedback on our data sets. This gives an opportunity for a more "neutral" researcher who is outside the PAR to interrogate our own methods/findings, and examine our relationships to the material and to our participants and one another.

Even with all these safeguards in play it is inevitable we have bias. I'd argue this is always true of research, and that we are being transparent about where ours exists, which makes it easier for the reader to discern the degree to which they trust the data and where they may want to interrogate further.
Role of the Researcher

As I have stated throughout this dissertation I have multiple roles in this dissertation research. I am both searching as a researcher, conducting this project for my doctoral research. Within this capacity I am engaging in this project within a PAR framework – which means that even within this framework, I am an active participant, co-designing many of the processes. I have been involved in meetings with permEzone and C-MRA and helped them think through pedagogical aspects of delivery, and how they might improve upon their continuous evaluation models. That being said, I have largely taken a step back from those aspects while conducting my doctoral research, instead more engaging in PAR via the direct photo-voice project. I have an ongoing and longstanding relationship with many of the people involved in this research project.

This both increases the trust and vulnerability with which the work is conducted, increasing the likelihood of risk taking and transparent storytelling. It also changes the dynamics of the "objective" researcher – a concept PAR and critical theory reject. It is entirely possible that the farmers and administrators, out of a sense of duty or loyalty to our relationship, try and offer data they know I am looking for, trying to anticipate the answers they think we want. We have left our research questions and prompts worded broadly and in ways that can be widely interpreted to help avoid this.

Those involved in the project know that I am staying involved beyond the doctoral work and this too may inform the nature of the data collection and stories being shared, dynamically. This being said, absent such relationships, when researchers do not engage in PAR and (critical theory would say falsely) hold neutral positions, there are similar trade offs in the nature of the risk taking, vulnerability, and quality of stories that are shared. It's the
nature of PAR – and I’ve been as transparent about my relationships and positionality as I can be with those reading the research as well as those participating in it.

**Triangulation of Data**

In order to try and triangulate the stories collected in this dissertation I have done several things:

- The stories have been thematically analyzed (discussed in greater detail in subsequent sections). This offers a more detailed matrix by which the stories are presented in a schema, and broken down by characteristics that others could with some reliability reproduce based on the content of the stories and photos themselves. It's rooted in a descriptive reality of the text and photos.
- Have confirmed how Paul, Hugh, and Sheena would read those descriptive schema from the stories using inter-rater reliability.
- Have verified these interpretations via member checks with the farmers.

This offers a level of rigor to how this qualitative data, presented in the form of photo-voice stories have reliability and validity increased.

**Methodological Tool vs. Analytic Frame**

In the section below I will only be explaining how the photo-voice method for data collection as a tool functions. The narrative analysis, which is the manner in which I will interpret that data, will be explained in Chapter Four (in order to intelligibly present the findings) and then utilized in Chapter Five to interpret them.
Personally I often found the distinction between the tool and the analytic frame confusing, perhaps for others they aren't, but I wanted to make clear which was which, and why each is discussed in what chapter before continuing on to the sections below.

Methodology & Tool: Sense Making and Knowledge Sharing Utilizing Photo-Voice

As noted from the beginning of this dissertation, this research is framed within a participatory research model and is also situated within a case study. It seeks to find ways to elevate community voices and encourage members of the community to feel empowered to not only increase their voice, but to find ways to engage in improved sense-making with one another as well as knowledge sharing. To learn what they know, and how to improve and innovate upon it themselves. This means an ability to recognize that they themselves often are capable of engaging in a form of citizen-science research and that the best ideas for solutions can often come from, and already exist or are embedded, within the wisdom of the communities facing the obstacles (Pascale, Sterin, and Sterin 2010). So what methodological tool would allow for an ability to “influence community dialogue and policy-making process itself” especially “those working in participatory visual research” (Mitchell et al. 2016)? As Mitchel et al. note, photo voice is an ideal candidate methodological tool for such research. Photo-voice as a methodology and tool is often used specifically with the intent to be “purposefully oriented to have an impact beyond scholarship, engaging directly with communities and authorities and fostering practical change” (Johnson and Levitan 2021). There are a number of researchers who have documented variations of this method and its effectiveness in other settings such as:

- visual arts with young people (Delgado 2015)
- drawing (Theron et al. 2011)
• comparative mapping (Hallman et al. 2015)
• Digital storytelling (Gubrium and Harper 2013)
• Participatory video (Milne, Mitchell, and De Lange 2012)

During photo-voice participants are asked a question (called a prompt) which is designed to interrogate a specific research question. (The mechanism of this design will be explored in further detail below). Around this prompt that the researcher offers participants, they then go out and take photographs, and in addition to the photographs they add a "voice" component to the picture. This may be done in writing or audio, but the key aspect is that it adds their own personal narrative to what they are capturing and seeing when they take that photograph.

Importantly such approaches allow for participants to “speak back” (Milne, Mitchell, and De Lange 2012) to the researchers, and help address the power dynamics that exist, making this a particularly appropriate methodology for use with marginalized populations (Mitchell et al. 2016; Wang and Burris 1999). It also allows researchers to explore and better understand otherwise hidden aspects of participants lives (Harper 2002).

Interestingly this emergent methodology has also more recently been explored for its potential impact within policy as a means for not only increasing community dialogue, but cultivating collective action, and influencing policy specifically as a consequence, a topic taken up in several recent books such as Learning from the Ground Up: Global Perspectives on Social Movements and Knowledge Production (Kapoor and Choudry 2010) and Participatory Visual and Digital Research in Action (Gubrium, Harper, and Otanez 2015).

What should be stressed here is that the methodology of photo-voice is a broad category that can include, as seen above, many different aspects for ways of storytelling, via video, photos, drawings, film, and so forth. The key aspect is that it is participatory in nature, cultivates dialogue, and engages in a form of sense-making and knowledge sharing. Ideally it
leads to some form of community building and collective action that may influence policy as well.

Given the importance that has been emphasized repeatedly in this dissertation of elevating voice – consider the richness that photos and "photo-voice" (audio) add to such an elevation. Instead of speaking on behalf of someone else, this participatory approach to data collection literally is another persons voice. In this case, their actual voice. In addition to being their own voices – including all the richness of tone, emphasis, and everything else captured in spoken human word – it includes their artistic expression of the photographs they took to answer a question. This further elevates their voices via an opportunity to tell a story, express themselves as photographers (artists) – and enrich the data they are sharing (their voice/audio) with a visual narrative. This creates a rather full data description – adding to the credibility of the story being both shared and interpreted. With such a rich data there is a more descriptive reality being offered by the farmers/participants – leaving less space for interpretation that deviates from the intended meaning of the farmers. As I will note in footnote 44 – there are ways in which the approach of this dissertation is similar to that of grounded theory – but a main difference is that grounded theory continues with iterative data collection until reaching saturation, which helps guarantee a more accurate understanding. Since I am not able to reach data saturation, anything that can help ensure that the data set offered is being correctly interpreted is crucial – and thus a rich data set adds to the credibility of the voices being elevated.

On the nature of data collection & observations when utilizing photo-voice
I will only write here a **very** brief introduction into how the photo-voice data is generated and interpreted to help the reader(s) make better sense of how this methodology functions for data analysis and anticipated observations rooted in literature and comparative studies.

Unlike many other methodologies, in participatory visual research, the analysis should include some form of post data collection (a check in) with the participants to ensure that the interpretations of the “voice” are accurate (De Lange and Mitchell 2012). It is for this reason that I have focus groups as a follow up to our data collection utilizing photo-voice. This will allow me to engage in a form of photo-cued interviewing (but instead of interviewing one-on-one, I am doing focus groups. This is all part of what is known as narrative analysis – interpreting the stories that emerge (in this case) as a function of the photo-voice. We in fact did this mid data collection and discovered there was a little confusion regarding the first research question's prompt so we paused data collection and added a workshop on how to use the phones and engage in photography with a professional photographer who does this kind of work (photo-voice) to aid in the data and research empowerment. The farmers were then able to themselves conduct better self-evaluation of their data and feel more confident in their ability to engage in the PAR as expert producers of knowledge. Photo-cued interviewing “is a novel photo-elicitation type method” (Johnson and Levitan 2021, p. 5) that allows for visual and dialogic engagement with participants experiences.

I have chosen to do focus groups instead of one-on-one interviews primarily for logistical reasons. Using the remote technologies to adapt to COVID we are utilizing, coupled with translators and even with the upgraded (and expensive) equipment to help secure the necessary bandwidth to have remote access, it remains difficult to always guarantee a good connection. To arrange for all the individuals to do one-on-one interviews under these conditions is not realistic. It would put an undue strain on them and the field
managers and FFS teachers. However, focus groups are a realistic option. Focus groups also help the community to engage in further dialogue and knowledge sharing about what they have learned, and potentially help cultivate collective action downstream. Utilizing both the actual photo-voice, and the feedback/interpretations from the participants is in line with Harper’s understanding that this methodology ties the findings and analysis to the photos themselves (Harper 2002).

Phrasing the Prompt for Photo-Voice Data Collection

Asking the right prompt for the photo-voice data collection is tricky and “requires thoughtful planning” (Johnson and Levitan 2021). The reason is that you want a prompt that is broad enough that it allows for stories driven by the participants, but precise enough to actually drive answers that address the specific research question. For this reason, both the prompts used in this dissertation have been co-developed, with help from my advisor Dr. Aaron Benavot, my committee member Dr. Kayla Johnson, and have been validated/edited with help from our core team of researchers noted above which included local input to insure the prompts would be interpreted reasonably accurately by local farmers.

This dissertation will not have the capacity to follow the implications of the impacts of this research on policy, which remains understudied with regard to the “focus on the implications for policy dialogue at either the stage of production or the tracking of follow-up actions” (Mitchell et al. 2016). Once COVID has passed and there is an opportunity to display this data C-MRA along with other partners will be seeking opportunities to have the villagers come together and demonstrate their knowledge at a government site (to be determined) to begin having this kind of policy and political impact. One of the advantages of
photo-voice is the “eye-catching ways” that the data lends itself to, which can at least potentially help to cultivate not just advocacy but public engagement and policy change (Wang and Burris 1999). For example, photo-voice data can easily be used to create art gallery presentations in which voices normally ignored from policy discussions or excluded from having something intelligent to contribute to knowledges in a content arena, can instead be the center of the stage. Politicians, local chiefs, influencers, neighbors, and others can be invited to attend, and such events can help generate excitement, affirmation, and generate collective action and facilitate more dynamic and honest conversations about needs and knowledges. This dissertation has created a data set for C-MRA and the people they work with to be prepared to engage in such work (and for studies to be done around it) once COVID has passed as part of my (and their own) future research agenda. Work is underway to organize such programming already.

Participant Selection

Participants were recruited from farmers who had already participated in permEzone/C-MRA’s permaculture based FFS training in 2021. This was a limited number of people – we were hoping for at least 10 participants to sign up from each village (so two villages meaning we would have 20 participants). The second village ended up dropping out of the study due to a falling out with the lead trainer there who went his own way and created his own organization in the end. Of the initial 10 lead farmers who joined our study 8 completed the data collection.

Any farmer who has participated in the previous permaculture design curriculum training in Western Kenya in this region is eligible to participate. There were no exclusion criteria.
The farmers were recruited via Paul Omollow who already knew all the farmers from his having taught them during the training. We used a flyer I helped create which explained the research project, and fielded questions. We then arranged for a Zoom meeting and spent a few hours answering all the questions after a brief presentation.

So all farmers who participated in the study have already been in the permaculture FFS training with permEzone and C-MRA. Since the research I am conducting is based on determining the impacts of permaculture curriculum within Farmer Field Schools, I am beginning with farmers who have gone through such trainings over the past two calendar years.

We received consent forms (in coordination with IRB) which gave permission for us to use their actual names and other disclosing personal information, per the request of the farmers. It is their stories, and they wish to receive attribution for them.

The sampling of the farmers from the training is nearly the entire group that participated in the training (over 80%) – so what will begin to shed more light on how representative these findings are is when we begin running through the data with the other four sites and see what kind of variability emerges from those data sets. This data set does represent a strong sample of the farmers who participated in this training.

Data Collection Process & Timeline

In most photo-voice studies it is typical to give two to three weeks’ time for data collection. Giving participants too much time can lead to a loss of interest or cameras. We also want to ensure we are giving enough time for the cameras to be shared among the farmers, and for them to visit the places that are of importance to them in regard to the prompts and research questions. While it was initially thought that three weeks would suffice
to do this (which was confirmed with the team on the ground), given the intervention we
needed for the workshop on photography, and delays with the pandemic and some farmers
who were simply slower to collect their data, as well as a few who had larger/robust data sets
and were more reluctant to hand over their cameras (!) the actual collection time ended up
being closer to two months. I noted earlier in the dissertation that since I am working with a
group of adult learners where half of them are not literate that more time may be necessary,
and this in fact did prove to be true, though some of the reasons proved otherwise, including a
positive reason, whereas I assumed only a deficit based one (despite writing an entire
literature review focusing on not doing this, and yet slipped into it myself anyway).

Below I will list the step by step nature that participants went through, and then give
the timeline of these events as they unfolded.

Step 1:

Participants will have completed a short demographic and a pre attitudinal survey
before the training (which is also attached), which will be conducted remotely. This was
delivered in person at a socially distanced and legal gathering before the first workshop in
which consent forms were handed out and the project was explained and questions were
fielded. The survey took between 10-20 minutes for different participants to finish.

Step 2:

I used Zoom to conduct two trainings, while we also conducted a third Zoom training
as an intervention based on a feedback loop. These first two trainings were conducted over
weekends at noon East African Time (3 am EST) which was the most convenient time for
the farmers to gather on a Saturday. Each workshop lasted about 3 hours. Villagers used
WhatsApp to take photos and record audio stories and share with one another. [WhatsApp has become a standard secure form of using photo-voice in research, see e.g. Johnson 2020; and Johnson & Levitan 2021]. I purchased equipment, so they had stable access to internet.

The workshop covered the following topics:

- Why this research was conducted
- How photo-voice operates
- Manners in which this allows for the famers to “speak back” to policymakers and others
- What citizen-science means and how they became the creators of data and researchers
- What the prompts as they relate to generating photo-voice
- Practicing a “fake” prompt to practice using the smartphones to answer a question
- Going over aspects of the smartphones purchased and share knowledge with one another about how to use the phones for recording photographs and recording audio within WhatsApp
- How to upload the photos/audio recordings in WhatsApp (this is a standard method using in photo-voice research – see Johnson 2020)
- Practicing using the phones and uploading
- Conversation/questions around the prompts/methods (there was a great deal of excitement so this took more time than we had anticipated)

Step 3:

Participants were themselves the researchers, engaging in citizen-science, they were
the generators of this data set. Using photo-voice the farmers have now collected the data over two months, centered around the two research questions noted above. Participants were encouraged to upload their photographs and audios live as they took them, or within a short period of time before they became lost or forgot what they wanted to narrate. Sometimes this required reminders which led to "batch" sends of data by certain farmers.

Step 4:

While I initially had planned for a focus group, this kept proving difficult to organize. This was largely due to impacts of the pandemic. It was also partially due to the delay of data coming in from some participants and having to delay the focus group since I couldn't conduct a complete presentation of the findings/analysis and thus know where to engage in a prodding of the data with questions for the group without this. By the time we wanted to conduct the focus group we pivoted and decided instead to do the following:

Engage in an in depth interview with Paul Omollo about questions regarding gaps/insights to be had around chapter five analysis to confirm or push back or add some pigment to the canvas around my analysis.

Provide the farmers with several written questions that they could then gather as a group to discuss which Paul and Caroline Atieno Abwao, would record together on audio and then translate and send me a translated audio of to add a photo-cued interview and focus group feedback of sorts.

Translation of Photo-Voice Data

The data we collected was translated by Paul Omollo as well as a colleague of his Caroline Atieno. Paul has a BSc in Horticulture from Moi University, Eldoret and has a Professional Certification in Program Monitoring and Evaluation with The Kenya Institute of
Management. He took his Permaculture Design Certification (PDC) course in Laikipia Permaculture Centre. Previous experience includes as a member of the Permaculture Research Institute, Kenya's projects team, as a Field Agronomist and then Project Coordinator in Migori County for the USAID Kenya Horticulture Competitiveness project, as a Field Assistant (Horticulture) at Sauri Millennium Village, and as a Sales Agronomist for East African Seed Company. While there are certainly complications with having someone involved with the project also work as the translator, there are also benefits. Paul knows the farmers, making it more likely they offer honest answers to him – as they know the data is being shared. Additionally when clarifications are requested and member checks are conducted we have a reasonable expectation that there is enough trust with Paul that we receive honest answers.

Finding "official" translators via institutions such as University of Nairobi or Strathmore would have been prohibitively expensive for this project. Paul is a graduate from the number 7 ranked university in Kenya, and speaks fluent English and Luo – and we had his partner (NAME) conduct an independent translation that I compared and then asked them for clarifications where there were meaningful disagreements. Coupled with the fact that upon inquiring about the meaning of their own data after analysis, there were no statements from farmers amounting to "you misunderstood/translated what I had said" - we are thus confident this gave us a valid and rigorous translation.

Given that this was an action research project, I think it is also valuable that an insider/outsider (Paul) was involved in the translation – making it more along the lines of PAR – as opposed to having someone totally outside the community/project conduct the translation.
Workshop 1: On Participatory Action Research & Photo-Voice with Paul Omollo (3 hours)

In the first workshop Paul and I share much of this background with the farmers and help orient them to the research. Specifically, we explored:

- Some introductory definitions
- Facilitated conversations around the purpose and ideas behind PAR
- “Talking back” with voice from them in such research
- Review of the training and FFS/curriculum they have previously done
- How we would use their photo-voice data to investigate some of these ideas
- Examples of photo-voice from indigenous farmers in Peru and Kenya, including art gallery displays afterwards to cultivate collective action, power, voice
- Questions and more conversation

Conversation especially focused on encouraging the villagers to think of themselves as researchers with the power to find their own solutions. They reviewed and highlighted examples of ways in which this has already occurred in previous permaculture design courses and had others share similar stories. This helped ensure generative narrative data on their part, which is the source of all the data for this study.

C-MRA shared as part of their ecopedagogy curriculum the following tool called a Systems Diagram as an activity with participants to help get them to begin thinking about the larger systems at play in their lives and how they interact prior to our workshop.
Workshop 2: How You Will Be the Researchers – "Speaking back" with your own data collection and evaluation loops with Paul Omollo (3 hours)

In workshop two the primary focus was on training the villagers on how to use the cameras and smartphones and the variation in data we were looking for within that. Many of them have not had exposure to a smartphone before. The smartphones are not being bought at a 1:1 ratio of farmers. Instead they were shared and passed among farmers who already have contact with one another. Among the participants we have 6 smartphones purchased. We utilized WhatsApp and ensuring that they understand how to both take a picture, record an audio story about what the picture means to them, and share it.

Villagers had the opportunity to explore and experiment with the phones together during this workshop. They also had the opportunity to ensure they knew how to share what was on the phone with one another when they met to pass the phones, so that there is an additional layer of sense-making and knowledge sharing between farmers in a more intimate setting.

This workshop also included explanations on the ethics of taking photographs. For instance, ensuring you have consent to take a photograph of another person, or parental consent if taking pictures of children.

Lastly we practiced some prompts (not the two being used in this dissertation for the research questions, so “fake” practice ones) to demonstrate how a prompt is meant to elicit photo-voice – to answer a prompt which has a research question behind it. We unpacked this, give a few examples, and offer the farmers 30-60 minutes to go practice using the smartphones and “answering” two different prompts. They then came back, shared examples,
and discussed together observations from those photo-voice findings, and some of what they may conclude from it. This way they came to understand better how the research works, their role in it, and how the knowledge sharing could work along with potential future collective impact. Once prepared in this way, and feeling at ease with their questions/conversation, we shared our actual prompts for this dissertation, checked for understanding and field questions – and then concluded the workshop.

**Intervention – Workshop Three: Better Photography with Colin H Richard**

As was noted in an interview with Kayla Johnson (personal communication, December 2020) – when photo-voice data is shared (as we were doing via WhatsApp) and/or when the method is new to a group (also our case here) – mimicry can become more of a risk factor. We knew this was possible going in but wanted to see what might happen with the knowledge sharing. After a week of data running there was too much mimicry in our collective views. There also was not a lot of variety of types of photos/stories. Given the low level of literacy around photography, we decided to interrupt our data collection, and add a third workshop, which was run by Colin H Richard, a professional photography who has run photo-voice projects in East Africa (and rural Kenya) previously.

This additional workshop focused on specific skills around photography such as framing, exposure, lighting, angles, and some of the basic editing tools that are built in to their smartphones. An evaluation from this workshop written up by Colin is attached to the end of this chapter which offers his insights into what occurred in this space. To offer more intimacy of learning and trust building, since many of the farmers had only met me more recently (again a COVID complication) and were now going to be meeting Colin for the first time – there was a lot to try and do in a short period of time. To facilitate that trust building, I
did not attend this workshop so that Colin had more space in which to operate as the facilitator with Paul.

**Action research – Participatory action research – or Community Based Action Research**

Having now reviewed the methods used in this dissertation – an important question can be reviewed – namely – what did a “participatory” dissertation end up meaning in this case? Clearly it was participatory – and this was intentional. But there is a range of participatory possibilities. A few graphics below help to note some of this continuum:

![Spectrum of Community Engagement](image)

**Figure 6: Spectrum of Community Engagement**

If we look at Figure 6 then this research would fall under CBPAR. The community has been involved in all aspects of the research. From the selection of research questions – including input on the language used – to the tools used for measuring the data – to the data collection itself. While I as the researcher analyzed the results, this was *the only step* that did not include the farmers (the community). And that is a unique case in that, in the future, the farmers would be doing this analysis as well. My analysis in this case is helping create a model for them of how to take the data from the tools they created, and the data they generated in order to do this. We intend to have community involvement in this aspect as well in our future research with other neighboring communities around Kenya and Uganda. If
we look at the other aspects of this continuum – it is clearly not just a secondary data
analysis, nor was it only recruitment by a community organization, nor was it limited to a
community sponsor of the research.

![Participation Continuum Diagram]

**Figure 7: Participation Continuum**

Looking at Figure 7 for a participation continuum it also would indicate the most radical form
of participatory action research. The community was involved in deciding:

- what mattered most to them,
- helping determine ways to conduct the research,
- designing tools to measure the data,
- conducted the actual research,
- they will be helping to disseminate the findings at art galleries (among other formats)
  around Kenya (this is something we have planned but have not yet carried out)
- have written reports that are also being distributed both via digital formats globally and
  around Kenya
- designed interventions based on the analysis I have conducted using their participatory
  theories of action/change conducted with Paul and others to begin considering ways to
  improve their own community
- created a community board that has created a savings and loan program and are working on
  local interventions, completely independent of anyone outside the community.

Based on these descriptions, participatory within this dissertation work would meet the
criteria of a Community Based Participatory Action Research.46 While this is perhaps most

46 For an excellent list of CPBAR curriculum see [https://cbprhub.com/](https://cbprhub.com/) - a particularly excellent CBPAR
curriculum is Campus Community Partnerships for Health. Developing and sustaining community-based
participatory research partnerships: A skill-building curriculum. Seattle, WA: University of Washington – this
used to be online but has been increasingly difficult to find. It is well worth digging up if you can locate it – it is
superb and great for helping develop both ideas and skills with your team. Another very good reference that
clear from the research design I have explained – the decision making process was what
drove this. It was not only my own motivation and ethics that drove this, but that of the
organizations I worked with, both permEzone and C-MRA. These organizations are driven by
participatory design principles – both permaculture and monitoring and evaluation models
that espouse participatory tools, evaluations, and theories of change and action. As I've noted
in various parts of this dissertation, it was for such reasons that we chose to work with one
another – our alignment of values in how to conduct ethical and meaningful research. It was
also for this reason that specific farmer field schools and sites were selected – where there
was a willingness by the community to engage in such a democratic and participatory
approach.

This was an iterative and on going process – and took many years. The nature of roles
changed throughout. We relied heavily on Paul throughout to help maintain lines of
communication with the farmers and ensure they had a voice and way to be in touch with us
at will and offer feedback if they felt/thought there was becoming a misalignment in voice or
power. The most constant contact between us and active nature of "co" roles was during the
preparation of the design of the research, and the data collection itself. There were often long
periods of "quiet" in between. Sometimes when we were in a "wait and see" period due to
Covid, or sometimes as I was working on a literature review to offer them some theoretical
concept to get feedback on, or sometimes because they were in a learning mode during a
course or engaged in agricultural work and did not have bandwidth for engaging in other "co"
activities during sowing/harvesting time.

relates both CBPAR and NICS (systems thinking and improvement science) is Lindamer et al. 2009 article
"Establishing an implementation network: lessons learned from community-based participatory research.
Implementation Science."
Timeline

Day 1-10:

Cameras are distributed to the farmers.

Each had the camera for half the week and then exchanged them with another set of farmers. During the exchange they shared knowledge (and can help check for understanding about technical literacy on camera). We have deliberately made initial potential pairings of farmers exchanging cameras based both on geography as well as high/low technical literacy/comfort with the smartphone. It will take roughly 10 days for everyone to have had access to the cameras to explore the first prompt. Each farmer should take a minimum of 5 photos/recorded stories per prompt. I am hoping for more since they were being asked to select their favorite 3 for the photo-cued interviewing (and have been told this in advance).

Day 11-15: Data check

As I checked over the initial data with Paul Omollo and my advisor Dr. Benavot, we all realized we need to pause for a moment. The reasons for this were noted above, and this continuous evaluation feedback loop can be seen in its utility here. Had we waited to do an evaluation of the data until it was all collected it would have been too late. It is also likely that if we had gone back at this point, that farmers would have felt let down by the work they had done, potentially deflated and that trust would be broken, and so in all likelihood would the risk profile of those farmers going forward. It could literally have derailed the interventions. Instead we helped create a container in which risking wrong answers was encouraged, and vulnerability was maintained. A workshop was created and skills were built
up in a participatory, playful, and safe manner, and the resulting data set with narratives was significantly improved.

**Day 16-25 Prompt Two**

Data collection resumed for prompt one. At the same time farmers had received the workshop and training around the second prompt, so there began to be overlap at this point in data collection, as some finished collecting for the first prompt and were eager to move on to the second, whereas others needed more time. There was no pressure applied to the farmers around their own timelines here, they were encouraged to take quality over quantity of photos/narratives and if they needed a few more days or a week to get a shot/story they wanted, to do so.

As farmers began exploring the second prompt, as in the first data set, farmers began to explore this new question and their responses to it. The same protocol and setup was used. As I awaited the data to come in I began organizing it in folders on G-Drive using the coded names, so that each photo and story are attached together, and organized by participant. This gave more time for Paul to confirm they are ordered correctly, and he was then able to compile, with help from his colleague, to create a single translated audio file for each farmer in English which will form the basis of my narrative analysis.

**Day 26-30: Final Data Check**

We triple checked that the transcribed audio files correlated to the order of the photos (meaning the stories being transcribed into English correspond to the right photographs). We also checked in with farmers who hadn't sent in as much data (as well as the rest, but those
who had sent in less were especially offered a nudge here) if they needed more time, or if they were satisfied with the stories they had captured and shared.

We then closed the data collection of the research. Farmers were able to keep the purchased smartphones.

**Thematic meta-categories I anticipate observing based on this photo-voice project**

**List of specific anticipated observable components of data**

Rooted in the 100 plus page literature review I have written for my dissertation for University at Albany, there are significant insights I have that are theoretically based from the literature, but not from my own or the farmers I work with, lived experiences. Thus I had to be careful in assuming that such literatures will correctly predict observable data to look for in patterns prior to actually collecting my data. It could have created significant bias against seeing unexpected paradigms, psychologies, epistemologies, and wisdoms. I did my best to stay mindful of this.

That being said, rooted within the literature review that I conducted I anticipated the meta-categories below which were reasonably accurate to what I will discuss in chapters 4 and 5. As will be noted, some other topics emerged (fun) and others that I anticipated effectively did not show up (which is also of interest, especially if it related to what should have been in the intended curriculum). This is discussed in Chapter Five. I expected to see some differentials about photo-voice data narratives based on different farmer's perspectives and positionalities regarding:
1. Attitudes to life (biophilia). Such an example could be a farmer sharing a new gratitude to soil as a living organism to be cherished and treated with love.

2. A love towards place: Such an example may be illustrated in photos of their land and narratives around the rootedness they feel for this land. Ancestral attitudes, personal attitudes, again analyzed within thematic narrative analysis.

3. Content knowledge integrated from an ecopedagogy curriculum. Some of these examples include #1-2 iterated above – but other components would be attitudes to:
   a. “interbeing”
   b. Socio-historical understandings of histories impact on their ecosystem and lives (e.g. narratives around what are native or colonial/invasive crops, the nature of drought resistant local flora/fauna, how to reembrace ancestral wisdoms about land usage, etc.)
   c. Critiques of civilizational systems (e.g. narratives around any critique of the larger system, instead of one just at the individual level. For example, a critique of pesticide based farming, and monoculture (growing only one crop on a large piece of land) would be systemic critiques, pointing to ways they are paradigm shifting to new imaginaries for how to build their community and nation.

4. Gender based attitudes towards any theme. There is much reason to believe based on the literature that gender plays a role in attitudes to land, agriculture, resilience and attitudes towards family income dynamics, among other topics that could arise in this study. If different narratives around something from “interbeing” to land usage arise that are largely segregated based on gender, this would be an interesting finding. If it proves not to be true within this more critical curriculum, that would also have potential significance.
5. Based on my conceptual framework – learning from failure and embracing iterative learning. This may manifest in narratives in which they not only highlight what has worked, but what hasn’t, how they learned from it, and how this impacted change at the individual or communal level regarding regenerative food systems and community connections.
Chapter Four: Findings

Introduction

Before I begin this chapter it is important to disclose that the actual faces and names of the participants are used in this study. This was with special permission from the IRB, and in accordance with their permissions per a consent form. All of the farmers requested that their actual identities be used, in fact they were very emphatic that they would of course want this. It is their data, their stories, and they want their identities associated with them. They were upset in fact at the idea that the identities would have had to be anonymized (which points to the ways in which the ethics that guide research do not translate so easily across cultural lines when seeking to be ethical/moral about how data is used, who owns it, and for whose benefit it exists).

The purpose of this fourth chapter is to explore my findings. As I write this chapter I want to bear in mind some unique components of a qualitative research dissertation, as well as one that is threading multiple literatures, and utilizing multiple methods to the photo-voice data set as a consequence of its participatory action research approach to this case study. The purpose of the chapter is to report, as concisely and in as clear a sequence as possible the nature of the photo-voice stories that emerged. I will only be reporting the observations related to those photo-voice narrative, not speculating on their meanings (which will be done in Chapter Five – discussion). How I choose to report on such narratives however, isn’t so simple, given the very nature of how I collected this data.

This chapter will be woven not only from several threads of literature as background, but from a few different kinds of fiber (frames) if you will.

The first fiber is the way in which the photo-voice narratives are themselves presented. This requires making a choice about what type of narrative-analysis is used to
present the findings. Think about how we tell stories. There are many ways one can tell a story. For example, a story can be told in chronological order. That may seem like an obvious or only way to do so until you consider all the movies and books and storytellers who in fact use non-linear storytelling devices all the time. A story can be told that focuses on characters, or actions. A story can be told that focuses on what changed, or what remained the same, it can be told via dance such as in theatre, or in song. It can be told via music as in a symphony. Humans have a beautiful array of ways in which to tell stories. It is one of the hallmarks of what makes humans human (Lesser 2022; Shaw and Abram 2016). We are storytellers. So then, how I choose to present the findings, how I choose to tell the story of this photo-voice data set is a choice. This data is not neutral. This was discussed in Chapter Three on methods. For this reason, some methodological components will be discussed in this chapter four on findings, because the fibers (frames) needed to present the photo-voice data – stories – requires a choice of a fiber – a way to frame the story – and this requires a methodological choice.

The choice in fiber here has implications for both the framing of the data, as well as for the way in which those data will be interpreted. I will discuss my choice of fiber (narrative analysis framing) later on in this chapter. It approximates what some readers may know as grounded theory, which you may be more familiar with as it is more commonly used in academia at the moment (a very famous grounded theorist at the moment is Brene Brown). I will also at that point discuss some of the limitations of this choice in fiber, and how the combination of the specific thread of systems thinking offers an interesting possibility of countering some of those potential shortcomings, an idea that will be more fully explored as part of the discussion in chapter five.

With this outline in mind for the findings – I will now delve into a review of possibilities when choosing that first fiber – for even the fiber itself of narrative analysis has
multiple materials from which it can be built. Narrative analysis is not a monolithic fiber – there are several different types of fibers to choose from. Again, if we go back to storytelling, it isn't just linear or nonlinear options, there is dance and music and many other options. So too with narrative analysis. I will explore some of these options below and explain which one I have chosen and why for these data.

Possible Frames for Narrative Analysis

There are four basic materials one can build the fiber for narrative analysis out of – those are:

1. Structural analysis
2. Interactional analysis
3. Performative analysis
4. Thematic analysis

This dissertation uses thematic analysis (which is quite similar to grounded theory).\(^47\) I will first go through the other three options, briefly explain how they function, and why I have not chosen them (or how I am incorporating some aspects of them). I will then explain thematic analysis and how it will be used in my research to interpret my findings. First I will explain what narrative analysis is more generally.

Narrative Analysis – an introduction

\(^{47}\) These are similar because grounded theory works iteratively, there is a starting hypothesis, and then real world data is collected, and as data collection continues (iteratively) the analysis continues to go thorough revisions as well (a continuous iterative process of unfolding understanding). It may arrive at a data saturation point where no new ideas are emerging iteratively that help improve the understanding. The photo-voice data was also real-world data, it was layered, the data collection occurred as our analysis began, which allowed us to begin understanding if we had been on the “right” trajectory or not with where we thought these ideas may lead, and allowed us to slightly modify the data collection protocol itself. There are differences, and this was not a grounded theory dissertation. But there are also similarities for those familiar with grounded theory. We came nowhere close to having the kind of saturated and iterative data we would want to engage in more grounded theory work. That being said, it was an iterative process, not a linear form of knowledge gathering (the classical, hypothesis, go get data, then “where you right/wrong” based on that data). Both are rooted in a form of storytelling, and don’t necessarily start with a hypothesis, more a curiosity and wonderment, with perhaps some initial hopes or ideas about where something may lead, and then the data offers emergent ideas about how the phenomena actually operates. This is what we did also, but in a more limited data set, with fewer iterations, and a more narrow form of storytelling/collating (although I guess that last point is also debateable, photo-voice is wide/rich in other ways, but certainly different than the kinds of artifacts/interviewing that grounded theorists typically use).
Embedded in the lives of the ordinary, the marginalized, and the muted, personal narrative responds to the disintegration of master narratives as people make sense of experience, claim identities, and ‘get a life’ by telling and writing their stories. -Langellier, 2001: 700

As was noted in Chapter Three, photo-voice is a form of data collection meant to deliberately raise others’ voices. It is an ideal method for participatory action research, and even more so when looking to solicit data from groups used to being “left out” from equitable forms of voice, and power in decision making around policy. Narrative analysis is a way to interpret such forms of data through a storytelling lens in which “diverse texts – narrative...(are) evaluation as meaningful for a particular audience. Storytellers interpret the world and experience in it.” (Riessman, p. 1)

Photo-voice is meant to solicit stories. As was emphasized in our workshops, although many people around the world may not think of themselves as storytellers, we all are (Menakem 2017). People create a story of their lives – it’s part of what makes us self-aware and sentient beings (Schwartz 2008; Montagu 1957). A goal of photo-voice is to create an elegantly simple method to empower others to manifest their own storytelling power and voice – via the photos they choose to take in answer to a prompt – and the literal stories (voice) they attribute to those photos. Narrative analysis provides the lens through which the researcher (in this case – me) can interpret those stories.

Critical to all forms of narrative analysis is the ways in which the researcher must construct text for further analysis. The stories do not “just exist” after I have asked my questions (even if co-constructed) and “collected the data” – again even if the data was created and constructed in a participatory manner. “Narratives do not speak for themselves or have unanalyzed merit; they require interpretation when used as data in social research” (Riessman 2005, p. 2). It is still me who is interpreting someone else’s stories. Consider even when we tell our own story over a period of time, how we self-edit, change it, sometimes lie, embellish, maybe change what or how it has meant something to us, or how we’d interpret the
same event radically differently at different ages in our lives. Stories are not neutral, even our
own stories. How am I going to choose to do that for someone else, an even more
complicated notion? And rooted in what frame(s)? I can’t use all the data – I have to find a
way to organize, select in/out what I consider to be key aspects, justify this based on some
form of logic (presumably rooted in other philosophers’/researchers theories who use this
method), use field notes, and select sections of interviews/transcripts to support those
findings.

I will now turn to some specific options within narrative analysis before explaining the
frame I will be using to present my empirical data.

**Structural Analysis**

*You’re never going to kill storytelling because it’s built into the human plan. We come with
it.*” –Margaret Atwood

In structural analysis the focus is not just (or even mostly) on the content of the story.
Rather how, or perhaps better said, the way, in which a story is told is emphasized (Labov
1982). Tonality, the deliverance of the story now matters. Narrative devices, the nuances of
language are more emphasized here. Not just the content of the story. For example, stories are
often not told in temporal sequence (just consider how common this narrative device has
become in movies as a form of storytelling). When this has been applied to the data set as
part of narrative analysis, James Gee (1991) discovered that schizophrenia among one
woman he studied/listened to as a case study, made sense within such an episodically
understood narrative device (how fascinating is that?!).

While themes may still be explored, if the people who were telling the same thematic
stories were now telling them in very different ways or mannerisms, different empirical data
themselves would be presented – which would lead to different discussions – same collected data – different data set!

Given my lack of fluency in the language being used among the Luo, and my reliance on translators, this is not a realistic form of narrative analysis for me. It is one that interests me, and perhaps when there is less pressure on time and degree, one that could be somewhat explored when living there and collaborating in much closer proximity with my colleagues doing the translation is more feasible. Certainly paying attention to such aspects of the storytelling as part of a systems thinking framework and the nature of variation within the stories themselves fit within the wider paradigms and literatures I am using.

**Interactional Analysis**

*“The earth has music for those who listen.” William Shakespeare*

Interactional analysis makes use of themes, as well as components of structural analysis, but is co-created in meaning between the listener and the narrator. It requires more in depth interviews and time (and more approximates aspects of an ethnography). Bell (1999) used this method to show manners in which culture and politics shape the narration of the same storyteller over time.

When I began my doctoral work I had ambition to engage in an ethnographic study among the farmers within many of the same literatures/frameworks I have discussed here. That proved to be unrealistic given constraints on time – and even a modified version of a frame like this became impossible with COVID as I had to radically adopt methodologies and the research questions. Certainly aspects of this remain relevant, as the idea of measuring and being attentive to critical consciousness and changes therein, is one that fits nicely within a framework (interactional analysis) that lends itself to monitoring how stories change over
time, particularly as they situate within culture and politics. Perhaps this is a method within narrative analysis I may return to later within my research arc.

Performative Analysis

“Dance, when you're broken open. Dance, if you've torn the bandage off. Dance in the middle of the fighting. Dance in your blood. Dance when you're perfectly free.” — Rumi

In this frame of narrative analysis, narrative is “seen as praxis” (Reissman p. 6). That is, the narrator is a character – our inner voice(s) that narrate our lives in facilitate self-awareness – with a past, which tells a story of self and tries to persuade others about this version of self and the world. A researcher using this method will create a “scene” in which the performer steps in to narrate their story – and depending on the mode of the researcher they may focus more on the performance of the character via the oral narrative, via the settings they choose to narrate/create, the dialogue between characters, or how the audience themselves respond (Langellier and Peterson 2017; Riessman 2005; Langellier 2013).

To summarize in performative analysis, the storyteller, audience, and characters are all part of the potential analysis. As a performance, in some respects the audience (or reader) is the ultimate analyst – they interpret differently than the researcher or the teller of the stories48 (Radley and Taylor 2003). While this is a fascinating frame for me, and one that is similar to aspects of theatre of the oppressed (which is rooted in critical theory – a thread from the literature review), it is well outside of my skillsets and expertise to utilize such a framework. I have enjoyed occasionally crossing over and collaborating with friends who have theater backgrounds or more sociological backgrounds and do work in the arena. There

48 And seem to as a large group get such data sets ‘right’ in a different manner – look at how Beethoven’s symphonies were sometimes received by the public versus the critiques for example. This is hardly a unique example, dozens could be given just within the last few years from modern art forms that struck a nerve with public emotionality and zeitgeist and failed to excite critiques. The case of the single researcher can more easily miss an aspect of a story than millions of listeners.
is something very human about the ways in which this captures meaning and pays attention to somatic epistemologies. And as we discover more and more about epigenetics and the vast amount of knowledge our bodies hold as a system that exists outside of (often) our cognitive awareness (Bessel 2015; Walker 2013; Emily and Nagoski 2020), such a form of analysis seems imperative to capturing a more complete story. However, it is not a methodology I would feel comfortable using competently.

Thematic Analysis

*Narratives represent storied ways of knowing and communicating* – Riessman

In this approach, much like in grounded theory, as many stories as possible are collected. The focus here is on the content of the stories themselves. What concepts/themes emerge – patterns – are the lens with which those stories will be interpreted. This allows for conceptual groupings (Riessman) and often a case study (Cain 1991) are supported through the use of specific vignettes – in this case photo-voice stories.

An advantage of this approach is it allows for the development of new theories. This is an obvious gain for an academic dissertation focused on educational policy and leadership theories and implications. By offering grounded theories for innovative new practices and policies, this has the promise of meaningful contribution to the field utilizing this methodological approach. Another interesting component of this approach is that what is often critiqued as the main weakness of the approach could become itself if not a strength, at least a possible intersectional area of future research as part of my research arc given the literatures reviewed in Chapter Two.

*The contexts of an utterance – in the interview, in wider institutional and cultural discourses – are not usually studied. Readers must assume, when many narratives are grouped into a similar thematic category, that everyone in the group means the same*
thing by what they say. What happens to ambiguities, “deviant” responses that don’t fit into a typology, the unspoken? Reissman p. 4

The systems thinking and positive deviance approach I am focused on weaving into this tapestry, would specifically be looking to not do this. In fact, the more deviant the stories from the “content norm” the more interesting they would be to me as part of a systems approach! I find a few examples of this in my small N data set that I reference in Chapter Five, but by and large, this isn't addressed in this dissertation. Nevertheless, it is part of the methodological theory driving this doctoral work and worth noting that it also fits into the analytic frame (the fiber). For that is likely where I would assume there is communal wisdom, even if it is an outlier’s wisdom, in how to either do something very well, or the opposite, while recognizing it is a spectrum not a binary. To what degree this new fiber composing this frame would in fact counter the very real concerns of the critique Reissman raises, would in and of itself be interesting to reflect upon.

I will now begin to explore another material that comprises the fiber of narrative analysis which will aid in the explorations of the descriptive findings.

The Data Themes that Emerged for Research Question One

To recall – research question one asked:

In what ways does a non-formal ecopedagogy based curriculum cultivate critical consciousness among adult learners?

And the prompt used to interrogate this question via photo-voice was:

How do you see yourself as a creator in the way you farm and your role in that creation process?

A description of the findings using thematic analysis of the photo-voice data:

When reviewing the entirety of the "voice" component of the data set for research question one there are seven readily apparent themes that stand out, many of which have significant overlap. These themes are:
1. Theme One: inter-being and interconnectedness
2. Theme Two: Generating income via agricultural development
3. Theme Three: A systems approach to Gaia
4. Theme Four: Technical advantages and difficulties with regenerative agriculture
5. Theme Five: Pride in self-sufficiency
6. Theme Six: Agricultural resilience in times of Climate change
7. Theme Seven: Need for investment (outlier theme)

I have received during the IRB process permission from the farmers to utilize their faces and other potentially revealing information about their identities. The farmers, given that this was a PAR research project, and that they themselves are co-creators of the knowledge and wisdom in this dissertation, that they themselves are the co-researchers, have taken great pride in this work, and want to receive attribution for it. All information regarding their identities below is being revealed with permission and ethically.49

Creating the Coding Index for Thematic Analysis

In order to create the schema for the thematic analysis I had to establish patterns in the text and pictures. This is a big data set – and it can be overwhelming when facing such a data set. The truth is I had to get out of my home area (which I have read is true of many researchers when dealing with data sets such as this – going away somewhere – or spending a weekend at a hotel initially). To pour through the data set, and saturate yourself with it, in order to enter some kind of flow state and begin "seeing" it differently – so that pieces begin to puzzle together. As this happens iteratively it becomes easier and easier to check if this holds up to a descriptive reality.

I did this while sitting at a coffee shop looking out at Lake Tahoe – and pouring initially through the transcribed audio data. Every time that I saw a theme repeating (say two or three sentences had talked about taking care of their soil, or attending to starvation, or

49 I explicitly changed my language here to refer to the farmers as co-researchers as the method adopted – photo-voice – relied upon them as the co-designers of the project and the data collectors. They are, indeed, co-researchers.
being able to cope with drought – be it from one farmer or by several) – I highlighted these texts – and copied and pasted them into a separate word document. I would keep track of which farmers had made those statements and began coding them under different potential "themes." I did this iteratively multiple times – checking and rechecking, and then rechecking if those themes held up, if they should "collapse" into one another, or if they should perhaps expand and were really perhaps a few different themes embedded in one another.

The same thing was done for the picture component – what were aspects of photos that kept showing up? Perhaps of animals or certain permaulcture practices or techniques? And then how did these two different content areas overlap – how did the audio about that photo overlap – that is – tone of the audio when describing the photo. So there were three stages to creating these schema, and each one was done iteratively multiple times. As you can imagine, this took many days of full time attention. A single quote may have initially been used in multiple different themes, as many were initially related. I cast as wide a net as possible in my initial iteration on purpose and only began collapsing and narrowing the thematic analysis in later iterations. At that point I made (often difficult) decisions about where a quote belonged to a theme if it has been used in multiple different themes initially.

In this way I created a codex for my thematic analysis. I then checked this with Hugh, Sheena, and Paul and asked them to weigh in on how they had interpreted the audio/voice – and what they thought of my initial analysis. We had a preliminary conversation about this which helped me make some of those tough decisions about where to place a quote. We also then had Paul to a member check to verify if our understanding of the themes was accurate – and if the farmers resonated with how we were creating the themes for their photo-voice data – and if they had anything they would add/subtract or change about the themes (which they did not – they really enjoyed and appreciated the ways we had categorized their voice). The only addition that was made were some quotes around biophilia and gender which amplified
our ideas – but that data came in too late for us to use in this dissertation. It would not however have changed any of our results, only made those points even more pronounced.
Figure 8: Photo Emily Oslo

Emily Oslo’s smile shows the joy, happiness, and hope that has come to the farmers of Asumbi Village exposed to the permaculture ecopedagogical curriculum, who have learned how to thrive in normal conditions, and survive in drought and erratic climate change conditions.

Theme One: Inter-being and its relationship to Networked Improvement Communities (NIC)

Recall from the literature review in chapter two (see pages 12-14 in particular) that interbeing is defined as "a world view that sees the self as deeply connected with other human selves, with other species and life forms, and with the non-living elements of our world and universe as well (Hanh, 1987, 2010; Shubin, 2013). Interbeing also expresses the idea of codependent arising – an epistemology that captures the idea that all nouns are illusory – all things are emanations of one" (Epstein dissertation Chapter 2 page 12). In this first emergent theme – there was nearly always an interwoven related theme – that of collective action. This makes sense – as appreciating the idea of interconnectedness – oneness - seemed often to correlate with statements about working together to create change – that is – collective action. This interweaving of these threads will be explored in the discussion of Chapter 5.
Figure 9: Photo Jerry Wao

In this photo Jerry Wao discusses how the women are harvesting together, which they will sell to other villagers who have come to purchase (purple shirt). The women will keep this money, and the male farmer seen in the red shirt in the background is helping to weed.

As noted in Chapter 2, NICs should indicate:

- an embracement of failure and willingness to mention difficulties instead of hiding them
- a desire for working together to solve complex problems
- finding solutions embedded in local wisdom and knowledge sharing
- seeking ways to get better at getting better via such iterative learning

This basic descriptive reality is what I will seek to reveal briefly in the below thematic data, while offering a more detailed analysis in Chapter 5.

"All this I have planted to help my family – it is good to have vegetables" – Lucas Raute

Many of the villagers as they adopted permaculture techniques began to make specific references that interwove two themes: The first is that of the deep interconnectedness
between all forms of life – and how life cycles can be used via biomimicry to create more regenerative ecologies that also provide for human needs. The second is how by engaging in a process that is more in tune with natural ecologies, that NICs emerge that allow for improvements to the knowledge system of the community and raise the ability to provide for family units and the village at large. This was often expressed in proximal sentences linking the growing of more varieties of crops, or linking crop rotations, or not using pesticides to the ability to work together and thus elevate the resilience and food security of families and villages.

This is my farm that I have grown kale. Here I have adopted the kale with other different crops, like grafted oranges and sugar cane. Next to the sugar cane there is cassava. I have grown this so that I can have ease of getting foods and different fruits that can help. It also has maize and next to maize is banana. All this I have planted to help my family have food. It is good to have vegetables. It makes it easier and there is no time when people will sleep hungry because of lack of food. The fruits that are here have helped me in nutrition especially, fighting certain diseases. Thank you. – Lucas Raute

50 “some diseases are bought about due to the pesticides currently sprayed on them. Let's try and make farms so that we can help our families and neighbors” -Ashura

Another villager Hezekiah stated: “I have established my compost here to use it during planting and also to apply to my vegetables. I don’t use commercial fertilizer from the shops. This is what I use and it has allowed me to eat. I use it also with my maize and other crops. I urge people to use this so they can get the help (they need, without spending money).” Note the connection once again between interconnected bio systems, food security, and helping others.
Another villager, Emmanuel Wao, further enforces this worldview when noting, "I have planted kale which has helped me in getting food, by having the kale I can take some of it to the market and this generates income for me. I also eat it with my family. Second it also helps me to slow down soil erosion, after getting training on permaculture, I began mulching and this helps in keeping the soil cool all the time [and thus retaining the water content].” Emmanuel Wao went on to describe recycling of cow manure into nitrogen rich fertilizer, seed recycling and storage, and the joy of learning from others and passing on such knowledge "god bless" [emphasis mine].
Emmanuel Wao references the cow and their importance in providing manure to maintain healthy soils. Most farmers including pictures of cows, and none referenced them as sources of food. They referenced them in spiritual ways, providers of Earth. Creators of soil.

Again we see this weaving of themes by Emily Oslo. Emily Oslo discusses the variety of crops she began growing after exposure to permaculture (sweet potatoes, nuts, onions, kale, etc.) and how by producing surplus some can be sold to pay for education for her children, some can be used for breakfast and other meals and food security, and some "also improves our soil to be healthy and fertile." Moreover, Emily Oslo specifically links the modeled behavior and knowledge they are bringing to the village to that of a NIC, as her home garden has attracted attention from neighbors for the knowledge it offers, "and my neighbors also, when they need [to learn to grow better], they come to me, and I assist
them and they learn" [emphasis mine]. She acknowledges readily when she forgets something without fear "sorry I had forgotten about kale, I have some in the seedbed, and I will give some to my neighbor also to transplant so that they can also have." Another example of this more specific attitude towards NICs is apparent from Phillip who brought in the importance of local solutions and working together, "Let’s work hard to grow local vegetables and use methods based on local resources for fertilizer like animal manure rather than synthetic fertilizer. Let us work hard." Phillip followed this up when commenting on another picture by stating "I want this group of us - of Village Assumbi - to develop as we encourage others so that we can work together, I want this group to have togetherness so that we develop and do things that will bring development among us" [emphasis mine]. Valentine describes a similar goal and feeling of hope from this work when he states simply, "I am happy with the group. I have received valuable training."

Phillip makes this desire for collective action extremely explicit when he states, "I am urging us to have a strong energy in this group so that we see how we can shield hunger and have other development that can bring us money that will keep away problems that may try to come our way. I want us to have development here in Assumbi community. In this group let’s work hard and shield hunger." There are explicit communal goals in this attitude around the purpose of the knowledge sharing. Monica adds a similar perspective when noting that she grows fruit such as papaya for "my children to eat and it helps the kids when they are hungry" and that it can also be used in "preventing some skin diseases" and that ultimately she wants them to "take this to a cooperative society" so that by working together they can "better help families." This idea will be discussed in Chapter 5.

Moving on from this theme, a second dominant theme is that of utilizing the "valuable training" to be able to grow better crops and have a surplus that can be used to sell in the
marketplace to generate income to improve their own lives. This will be the second theme explored below.

Theme Two: Generating money via agricultural development

Interestingly, and I will stay as descriptive here as possible since Chapter 5 will offer the analysis of this component, the generation of income as a theme, also weaves back to the first theme of interbeing and NICs. Most times that farmers mention raising capital they directly link it to components of interconnected ecosystems, biomimicry, learning from others, and helping their family. It may be never have been, or at the very least was extremely rarely, ever raised as a goal (having more money/things) in and of itself.

Jerry Wao, who speaks about utilizing agriculture as a method of raising income more than probably any other farmer [meaning he is an outlier, and if anyone would serve as an example of a more capitalist development attitude it would be Jerry Wao], still serves as a prime example of this interweaving of these threads.

Cassava is a cash crop. The cassava that we have planted when we harvest we eat and it gives us nutrients. It gives our body carbohydrates. This farm is good. We will be able to harvest soon, and when it will be harvested we will sell part of it to give us income. Those who are interested in planting material will take and plant in their farms [note: a secondary form of income as it avoids having to buy these materials]. We want this practice to be more present in this village because it is sold to generate income, it can be used to prepare porridge, it can also be mixed with sorghum - milled and be used to prepare ugali which is a very good flour [an East African bread]. -Jerry Wao

There are multiple aspects to this attitude of income generation. One is the straight raising of capital, but others include replacing commodities that previously needed to be purchased that can now be provided by the community, be that food or building materials. This relates to another theme explored later, self-sufficiency.

Note also the ways in which the raising of income via regenerative agriculture are linked to specific practices such as being more attentive to weeding, thus enabling for healthier
soil/nutrients to the desired crops, and considering labor division to maximize the capacity of all genders to participate in the farming. "We will harvest them [the pumpkins – a new crop introduced with permaculture] in two weeks' time. The pumpkin leaves are also being harvested by, some are eaten, here at home as vegetables, others come to buy the surplus. The money the sales bring the women are then able to be use to buy other things. These pumpkins are doing very well. Pumpkins are a vegetable. It is also taken to the market to generate income. The roots hold the soil which also helps in controlling soil erosion." There is a clear interweaving of the threads of the themes.

Most participants made some mention of income generation in passing at some point. Comments included remarks such as "This banana crop is helping me with food. I also sell for some income which helps me with my family" (Valentine) and "I have grown vegetables and helped me in sales and allowed me to make money besides the training that we received" (Emmanuel Wao). Each of these statements reveals slightly different interwoven threads – one to interbeing (family) and the other (Emmanuel Wao) more to knowledge sharing (NIC). John Leonard discusses their cattle and that by growing more of the food for their feed they have surplus "which I can sell, and this helps me to raise some income." Phillip raises chickens which he mentions "help me in several ways. They give me money. I slaughter them for my family and they eat. My neighbors also come to buy from me to help (provide food) when they have visitors. Apart from money I also get eggs that help my family to eat. These chicken help me and my family and visitors. I urge us to all keep chickens." Note how the chickens are both attached to money making, knowledge sharing, and having more food security.

Monica adds another new variety of fruit being grown for income, passion fruit, "I go to my farm to check on my passion fruit. I’ve discovered some have ripened so I have harvested them to take them home to sell them." Part of the permaculture system is designing
farms based on zones, so that distance to different zones is based on frequency of visitation to each zone to maximize efficiency of output of energy (so fruit trees are typically most distal from the home since they require the least frequent visits compared to say a vegetable garden). Monica introduced this system, which relates to the following observation, "I was going to my farm where I have planted passion fruit to see if it has matured so that I can harvest on time. I have discovered it hasn’t matured yet. Normally once it is ripe I harvest and give some to my children to eat and sell the rest at market."

As noted in these above quotes, a major theme that emerged was that of income generation via regenerative agriculture. This is in line with much of the literature from Chapter 2 around development around agriculture, but with the addition of interweaving of threads related to interbeing, knowledge sharing and NICs, and non-capitalist forms of such development. I will now move on to a related theme that emerged connecting many of these threads in this cloth, that of a systems approach to Gaia and ecology.

**Theme Three: Systems approach to Gaia**

I'd like to make a slight distinction in this third theme, what I have titled "Systems approach to Gaia." As noted in the first theme, interconnectedness – often related in the immediate statements as being related to biophilia – was emergent in the first theme. Within this description, I called attention to the parts of the literature review from Chapter Two which discuss components of NICs that fit into this, particularly around a commitment to sharing knowledge, failing forward, and seeking more root causes and openness to learning from negative case studies – not just highlighting what has worked well.

This emergent third theme is not wildly different from the first one. It also points to interconnectedness. However, some of these supporting claims as will be described have
more emphasis on systems thinking specifically related to the frames around Gaia and biosystems, they often relate more directly to permaculture. Given the importance of this curricular component as an educational policy – as a specific manifestation of permaculture not just an academic theoretical discourse (which is also part of ecopedagogy) but rather a pedagogy with a praxis. There will be significant overlap in some of these thematic descriptions as a result.

One example of this curricular expression is from Lucas Raute who discussed how they learned to begin mulching their tomatoes. "The tomato crop has been helping me in terms of food" and the "second one is kale that I planted and mulched" because "before mulching my kale return used to be very low but since I learned about mulching, even when it is dry weather my kale now remains healthy. Hence I am able to harvest them more frequently on a weekly basis." Lucas Raute goes on to discuss composting and the recycling of nutrients within the regenerative farming system, and how this has also made farming easier (a permaculture ethic) – reducing the strain on their body.

Emily Oslo discusses transplanting their vegetable garden to a woodlot "I have planted the kale plants in a woodlot", which is a regenerative practice known as hugelkulturre – which allows for the planted wood to soak up water that it will hold in the soil – reducing the need to water and the anxiety of having a drought as the soaked logs will then put out some of that water into the soil and nourish the plants even during a drought. They also will provide a lot of nutrients as they break down. This was a common ancestral and indigenous form of farming that was rooted in biomimicry and systems design. Emily Oslo makes many of these connections explicit "As we were studying permaculture, we learned that one vegetable crop can be intercropped with several cops.” This allows for more sustainable systems as many such plants are interdependent, one provides what the other needs, think of the commonly used three sisters within New York for one popular example in this region. As
Emily Oslo notes in their reflecting on this newly learned capacity "I felt good" to learn about "me as a farmer" and the capacity to be more in flow with natural systems in this way.

Valentine has an enormous food forest with all manners of fruit. There are over one hundred species in this food forest. He proudly shows it off pointing to many of the different species. "This second farm of mine is a kitchen garden" he begins, and then as he points to different parts of his farm in the photos he orients us to various parts of it "here are oranges" and "here are papaya and passion fruits" "these are mango and when they are mature I sell some and eat the rest." He also shows us banana that he grows, "Banana help me more because the remains I also use as livestock feed" again pointing to newly adopted regenerative practices that use a systems approach. Valentine has deeply adopted this practice going so far as to point out "we are adding soil" through practices such as mulching and composting. He also is careful to stay on top of the weeding, with an understanding about why "we are also weeding the crop so the roots are not exposed, if the roots are exposed the plant will fall over and rot" [he goes on to explore soil erosion which would create more work for him undoing the soil creation he is facilitating as well]. This is a systems approach to farming.

In this third theme I have explored some of the ways in which a permaculture is evident as a curricular manifestation of an educational policy rooted in farmer field schools operating in Western Kenya.

Theme Four: Technical advantages and difficulties with regenerative agriculture

In the next section farmers raise permaculture not as a pedagogical idea and curriculum but as a technology. Examples of this theme will involve farmers speaking to specific techniques they have learned and are implementing. Again, aspects of this will overlap with both the first and third theme. However, I want to draw attention to this them
separately, as what I seek to emphasize in this description is not the interconnectedness or love towards a part of the system, nor is it the deep appreciation for the systems component of interconnectedness as related to ecology, but rather the actual technologies that permaculture provides.

*The first farm I tried [after beginning permaculture training] was with kale. I planted this before I knew anything about mulching [the technology in this case]. I used to get low returns from this. But since I was trained on mulching – the technique has helped me ever since. Even during the droughts, the vegetables are good and this has enabled me to sell to my neighbors when they have almost no vegetables on their farm. –Lucas Raute*

Note that in this description Lucas Raute calls attention to the mulching technologies impact on both the yield of the kale, its ability to be resilient to drought (and with climate change impacting this region this is critical), and its ability to also provide food for those who have not yet adopted permaculture techniques from the amount of surplus it is offering Lucas Raute and others in his community who have.

Lucas Raute is very aware of the linkages with this technology, "Since - later - I did mulching - the crop would stay longer. Alright now it is almost getting over this crop has helped me for quite a time. I have realized that it is good to do mulching and that makes work easier, mulching controls weeds, conserves the soil moisture, hence it doesn’t evaporate, it makes crops healthier." They even note "I am happy to be a member of research in Asumbi and I am hopeful you will bring more technology that will assist us in our farming activities."

The use of swales, a common permaculture technique used to berm areas that will have waterfalls that will create runoff, that thus allows water to more slowly pool and soak into the ground instead of rushing off. This creates a higher water table naturally and rebuilds the water table without disrupting salt levels. It creates more drought resilient ecosystems and was a technology that many farmers adopted. It is extremely labor intensive to create this
system, but once it has been built it lasts for a very long time (years, or even decades if
designed well) and the returns on it are manifold for the labor. But the upfront investment can
be a turnoff for many farmers. Nevertheless, it was often described as a beloved technology
by the farmers.

As John Leonard said, "this is my food forest farm. Here there is a set of swales that I
am pointing to. This divides my farm in two. It has helped me in seeping the water into the
ground which enables my farm to produce food." As noted by John Leonard, this knowledge
continues to ripple out, "so many people have been asking me how I got these skills. I am

Figure 12: Photo John Leonard

John Leonard shows off the swales that he has built to help hold water, build up the water table, and prevent
mass erosion on his farm.
always telling them to join our group so that they can always be trained” – again we see how the thread of this theme overlaps with NICs.

Valentine draws attention yet again to composting as a technology, its effectiveness as an alternative source for nitrogen and fertilizer and how it means "you don't need to go to the shop to buy synthetic fertilizer" and then spray "poison" on your crops such as "vegetables and banana."

Challenges also arise with these technologies – they are not always easy to implement. Valentine notes that with the introduction of chickens there can often be disease to contend with. "Getting medicine for them is sometimes a challenge" When this happens "they get sick and begin coughing and that is a big challenge" – some of this may be due to lack in knowledge for their culture and care still as this is a new skill. But some of it is simply a need for further resources to properly care for this new animal on the farm, and to care about another animal that is needlessly suffering and dying is upsetting for the farmers. Others raised such points as well. I will return to the importance of chickens in Chapter Five.

This section demonstrated some of the technologies that permaculture has introduced that farmers spoke to. In the next section I will address self-sufficiency as a theme. Some farmers made express statements related to this topic, and it was deserving of its own space to call attention to it.

Theme Five – self-sufficiency:

Self-sufficiency as a theme significantly overlaps with theme two. That is, income generation was often related to self-sufficiency. However, I would like to draw attention to this as a slightly different theme under this different focus. Income generation was its own
thematic category. What made it different was the framework in which it arose, and will be discussed more in Chapter Five. It was not often tied to a purely capitalist development, to make more in order to make more. Rather it was often tied to other goals; To provide for a hungry child; To go to school; To be more joyful. It was rarely to acquire stuff. Self-sufficiency, a sense of pride and being able to take care either of themselves, or of their family and village, were a common outcome or secondary feature of this second theme. I'd like to draw attention to them separately with some select quotes in this fifth theme – self-sufficiency.

As John Leonard notes in stating some of the crops he grows "I have grown avocado. When this is ready I sell some. I eat some. I do not buy margarine. I always use this avocado on bread to eat instead." One can hear the joy and pride in his voice as he shares this audio. It is unmistakable. Related to John Leonard's pride in his avocado crop, he discusses trying to figure out what is creating the disease among the fruit, and while he hasn't been able to determine it yet he declares with confidence "I will find out their treatment" – the sense of pride in his land, farm, and ability to be a researcher and creator and discoverer of knowledge has given him great confidence to figure out answers to questions he does not (yet) know. He is no longer reliant on seeking solutions from the outside, he is his own source of finding solutions.

Lucas Raute put it elegantly, "all this I have planted to help my family" – most of the statements by the famers related to one of two things: being able to have food to help their immediate family, particularly children – which often related to statements around not going to bed hungry and/or being able to help their neighbors with food when times were especially tough – usually because of drought. Food security was one of the most critical components of self-sufficiency. Beyond basic calorific food security became food security that came with diverse crops and a nutritious diet. And beyond this came one that supported drought
resistance and resilient crops that would provide even during hard times and ever changing climate due to human behaviors (theme six)

**Theme Six: Agricultural resilience in times of Climate change**

The words climate change was never used by the farmers. However, many aspects of climate change were observed and discussed by the farmers. For example, many mentioned increasing droughts, or new weather patterns that they had to contend with. This seems worthy of creating a sixth theme – which I simply naming Climate Change. Please note, many previous warrants for this theme have already been quoted and described above, particularly those related to drought. A few additional quotes providing warrants for this theme will be described here but I will not repeat the other warrants already mentioned. There is overlap with the themes for the same reasons there are overlaps with the warrants, these ideas are interconnected. They are fibers of a thread, and threads of a cloth. As noted even within the authors who examine frames for narrative analysis, the main critique and danger of thematic analysis is allowing for the collapsing of "all" ideas or people who are categorized into one theme to become viewed as entirely this or that – whereas what should be clear from my emergent description of my thematic categories – they are very fluid. It's a spectrum.

Phillip notes another reasons for intercropping (a technology mentioned in earlier themes) – growing both cassava and maize together – "The maize will mature first and then will remain with the cassava. This will help during drought and help in so many ways as it can be used in preparing porridge, ugali, and income generation." [It helps during drought because it is offering a cover crop and helps to retain water and prevent evaporation]. Phillip expounds, "Mixed farming and intercropping [a permaculture technology making use of
ancestral and indigenous practices] is really good as this keep away hunger, poverty, and many other things that bring human suffering."

Jerry Wao also brings attention to the importance of mulching because of drought. While pointing to his cassava crop in a photo Jerry Wao notes "the cassava has been mulched. Cassava is a drought tolerant crop…mulching helps in covering soil moisture [again pointing to a permaculture technology]." Jerry Wao then goes on to describe using intercropping with vegetables like pumpkin that will create a cover crop in order to "control erosion because it covers the soil" while also pointing to his "bananas which are hardy and can survive in drought." Clearly, many of these farmers have picked up on the importance of technologies and crop selections that increase their chances of having food security during increasingly unstable growing climates. Jerry Wao states, "That is how I work as a farmer."

Theme Seven – need for capital investment – outlier theme:

As noted in the first theme, we expect from NICs and systems thinking, a willingness to explore unanticipated outcomes and outlier attitudes, I wanted to make sure that I created space for that with another theme for any minority voices that arose. There is only one such voice/item that really stands out as a critique or raising of an issue – and that is the need for capital investment, or at the very least, capital investment as a perceived bottleneck to further development as imagined by this farmer. A more classical capitalist development model.

Valentine is running with many ambitious projects rooted in the pedagogy and technologies he is learning. This includes a banana farm plantation in which he would like to be able to expand and hire assistance. He states it is a "very good farm" that is producing income (but too slowly to expand the way he wishes) and food security for himself and
neighbors. "I am happy with it, and if one could have a farm like this and work on it like I do, they would have a high return on it for food" – and for this reason he wants to find capital investment to expand it more rapidly for development, and he has been unable to secure that capital, which has created a level of frustration where his vision can't be met.

Figure 13: Photo Valentine

Valentine's henhouse

Valentine has shared the same gap around his poultry farm. Valentine has raised hundreds of chicken per season on his own. However, with the cost of food and disease, that tricky cut off where it becomes income generating, or where a co-operative model would make sense for others, requires some capital investment for another hen house. As Valentine notes "I do not have enough money to buy medicine for them. I also have young chickens that need to be separated so the bigger hens don't step on them. I need another house for them
and I need someone to assist me with that so I can scale this farm up." I do not necessarily take this description by Valentine at face value and will comment on it in the description in Chapter Five, but I want to give voice to it given the unique nature of its voice compared to others in this section, as it was framed by Valentine.

Some expected findings of photo-voice data rooted in literature review: what did/n't show up for Research Question One?

The main discussion of these descriptive discoveries will be explored in Chapter Five. I want to note here aspects of the descriptions themselves however. There are some descriptions we may have expected to show up that did/n't which is worth noting here in the presentation of those themes for ease of the reading, and can then be returned to for a discussion of the implications/meaning of that in Chapter Five.

There are a few ecopedagogical curricular spaces that are at the very least weak in their descriptive expression in this data set. That is particularly related to "love of place" as a verbally articulated idea – however I would argue emphatically that the tone of voice in describing their farms, and photos themselves, make it very clear that love of place is evident in the data.

Another gap is around gendered norms. Much of the literature pointed to expected asymmetries around gender. Some of this has to do with land ownership, other components have to do with dominant cultural norms around gender and how that then manifests in spiritual attitudes to self, land, providing, family, and so forth. Yet there is very little data around gender. There are significant gendered outcomes to analyze, but descriptively there isn't much to mention other than that the women quoted in the themes above reference the benefit of regenerative agriculture as related to children and family more often than men, but men mention it too.
The Data Themes that Emerged for Research Question Two

To recall – research question two focuses on the communal level facilitating change and asked:

Research Question Two: In what ways is this ecopedagogy curriculum fostering collective change?

And the prompt used to interrogate this question via photo-voice was:

Prompt for RQ2: How is change made possible in your community?

A description of the findings using thematic analysis of the photo-voice data:

When reviewing the data set for research question two there are three readily apparent themes that stand out, many of which have significant overlap. These themes are:

1. Theme One: Knowledge transfer
2. Theme Two: Learning by mimicry
3. Theme Three: Learning by doing – working together

Introduction:

The second research question provided fewer emergent themes. All of which are closely related to how farmers perceive change occurring within their communities. There is important nuance however within those themes. The three themes are knowledge transfer, mimicry, and learning by doing (working together). All the farmers pointed essentially to their neighbors as the main way in which change occurs in their communities, to influencing someone else directly and creating a ripple effect. What distinguishes each theme is the way in which these impacts were created. This is what I will describe below, and will analyze in greater detail in chapter five while relating it back to more of the literature review from chapter two.
Theme One: Knowledge transfer (NICs)

In the first theme "knowledge transfer" farmers took on more of a direct role as a teacher. They found a neighboring farmer expressing some form of curiosity, and they took upon themselves the responsibility of offering them the teachings they had learned. As Lucas Raute describes this process "the three photos here are from when a friend of mine visited me. He saw how I was practicing my farming. I had planted some kale, onions, and banana. He became interested and asked me for farming advice." Because this friend does not live near Lucas Raute, and Lucas Raute was excited and engaged enough to want to encourage this learning Lucas Raute "traveled out to him and his farm and advised him on how to prepare his farm, how to make swales to store water, and how to apply manure for nutrients. He did this and now he should harvest well." Lucas Raute has become a teacher. Lucas Raute was likely always a teacher, as so many of us are, but in this capacity, as a teacher of farming technologies and attitudes to Earth, Lucas Raute has embraced his role as a teacher. His friend is doing well, "and then prepared another farm" as he says "more and more" – this kind of change is creating collective change that is rippling out. As Lucas Raute notes, "now we have plenty of food and others are coming to learn from us."

Similarly, Emmanuel Wao points out that he had "one farmer who say how I was practicing my farming" and this led to a conversation. "He came to get knowledge from me" and again Emmanuel Wao then took on this role of teacher. "He saw that my farm was productive and good." Interestingly Emmanuel Wao points out that this other farmer now "has hope to venture out into vegetables." Emmanuel Wao also takes pictures in which he notes his neighbor practicing some of the skills they have learned, from weeding to mulching, and observing different kinds of bugs that are either beneficial to plants or can cause disease.
Emmanuel Wao has gone from a passive teacher based on someone coming to him for knowledge, to an active participant recruiting others into this process. "We encourage other farmers to practice these new practices we are learning."

These two farmers illustrate the kinds of comments others made that speak to this theme for a way of learning that manifests change in community. I will now turn to the second theme, that of learning by mimicry.

**Theme Two: Learning by mimicry**

In learning by mimicry the farmers who received permaculture training are less active in offering their teaching. Rather, neighbors often literally mimicked what they saw the farmers I am researching doing. For example, Jerry Wao observes "there are now pumpkins in the neighbors garden [this was a new crop introduced by the FFS training using permaculture]. They are growing quite well. They have copied this from our training and our farms." Jerry Wao is happy to observe this. Jerry Wao goes on to list all the reasons that pumpkins provide utility to the soil, resilience to climate change, and health, and then says "this is why most of the people have decided to follow us." Similarly, Jerry Wao notes how the neighbors have "copied our work" related to ways to mulch the cassava and conserve water – and that the "usefulness" of the technology and ways to use cassava more broadly (such as to make it into a grain for ugali) "is apparent to them."

Jerry Wao further points out that some nuts and peas, and other nitrogen fixing crops "have also been copied from our training and our farms." This is good because "it provides vitamins and is a cover crop so it means our training is changing our community."

Monica also recognizes the power the villagers are acquiring as she mentions "we have gathered a lot of knowledge." Moreover, importantly, Monica notes that this
information is in a place of happiness. That it is creating a learning culture that is warm and as a result "my neighbor loved it and therefore planted cabbage and used proper mulching. We are thankful." There is a great deal to unpack in this description which will be returned to in chapter five. Monica also notes the ways in which their neighbor who copied them learned to begin mulching and that other neighbors of this neighbor then began doing the same thing "and also other neighbors have learned from those neighbors."

Hermann also notes how after these trainings "my neighbor has copied what I have been doing in my farm. He is now harvesting these fruits." Hermann was also proud of this, and took pictures of his neighbor, whom he shows off with a smile demonstrating his neighbor growing watermelons for the first time. John Leonard notes the same dynamic with a neighbor except that it is "to venture into mango farming." "The first photo shows her mango at flowering time. She learned these practices from observing my own food forest. She is happy with the crop."
Hermann takes a picture of his neighbor showing off his new watermelon harvest that he learned to do by mimicking Hermann’s farm.
In this second theme I shared some of the warrants for a form of learning that led to change rooted primarily in mimicry. I will discuss aspects of this in more detail in chapter five. In this last theme I will detail a description of learning by doing – when neighbors and the originally trained farmers worked together to extend the learning community.

**Theme Three: Learning by doing - working together**

In this last theme I give a few examples where farmers shared how change rippled out as a function of learning together in an ever broader learning community.

Phillip for example notes how "the neighbors are happy" about the upcoming harvest "and are joining in our efforts at cultivating this food crop" – and then points to a photo where they are all working together to learn how to grow this new set of foods, especially pumpkins. Valentine likewise notes how "I have assisted my neighbor" who had "seen all the work I do" on his own farm. As a result of this relationship his neighbor was able to learn "to take care of his cassava and kale crops that [we have worked on] together and he is happy with what we are doing." The picture shows both of them working together on each other's farms. Monica notes how an entire neighborhood began growing cabbage and harvested it bringing it to market, as seen in the picture below.
Figure 15: Photo Monica

Monica shares an image of some of the neighbors bringing cabbage to market – a crop that was grown by mimicking her own farm – adopted in the neighboring region as a consequence of the FFS permaculture training.

Some expected findings of photo-voice data rooted in literature review: what did/n't show up for Research Question Two?

For gaps related to the data set for the second research question I am going to mostly address this in chapter five, as much of this will be more rooted in a treatment of the analysis itself. For example, if I'm going to argue something around the bookends of improvement
science from the literature review – regarding knowledge management vs. participatory action research and what is or isn't showing up in this data set and where there are thus gaps – this becomes rather contentious without me first making some claims about this data and explaining those. That is hard to do with data of this kind and sticking to a purely descriptive presentation. So I will defer this section for chapter five after I have had an opportunity to present more analysis for this second research question, and then address any interesting gaps in themes that didn't arise.

Conclusion

In this last section I explored the descriptions of the themes that emerged from the last research question, namely how the farmers viewed their impact on creating change. What is clear from the descriptions from both research questions, is that there is significant alignment between what was written about in the second chapter for the literature review around ecopedagogy, and permaculture as a curricular manifestation of ecopedagogy, and what we are witnessing among the FFS that is utilizing permaculture in Western Kenya. While it will remain in chapter five for me to lay out some of the warrants to this claim, there is already significant descriptive data in this chapter to warrant that claim. This includes manifest examples of improvement science showing up, people being curious and wanting to learn how to get better, demonstrating vulnerability and a willingness to take risks at trying new ideas, ways they are learning about interconnectedness and caring about ecosystems, and all different layers of systems thinking. These are among the ideas I will explore in my concluding chapter.
Chapter Five: Analysis

“A sacred way of life connects us to the people and places around us. That means that a sacred economy must be in large part a local economy, in which we have multidimensional, personal relationships with the land and people who meet our needs, and whose needs are met in turn” (Birnbaum and Fox 2014).

A Consideration of Some Epistemologies & Ontologies

I’d like to reorient the reader a bit to the cloth made out of the threads from chapter two, and how this relates to the choice of methodology in chapter three. I won’t rehash all of these threads here, but rather focus on a particular pattern that helps create a view of this clothing which will help make the findings easier to understand and put them back into a context. [One wouldn't wear a heavy winter coat on the beaches of Miami].

When considering many of the core concepts embedded within ecopedagogy such as eco-literacy, inter-being, consciousness-raising, Gaia theory and the eco-spirituality embedded therein, the decision to use qualitative methodologies is, to me, manifest. To draw this out and demonstrate why, I will speak briefly one last time about one of these core concepts, in this case inter-being, and demonstrate how it links to many conceptualizations that holistic educational philosophers have promoted. I will lastly demonstrate how these same thinkers directly and explicitly link these connections to aspects of ecocide and the need for new epistemologies (such as ecopedagogy and curricular innovations like permaculture).

Four Arrows – quoting Mika – described inter-being this way:

One thing is never alone, and all things actively construct and compose it. As one thing presents itself to me others within it may appear and hide, but even if I cannot perceive them (which I cannot) we can be assured that they are there…Indeed, I experience an aspect of the worlded thing and its mystery when I meet the limits of my ability to say much about it, or when I realize that I cannot fully know it. Perception is given rise by the formation of the self with the full force of all things in the world. Moreover, I can talk about the thing, or more precisely, I am discussing it as if I am a part of it (Arrows 2019, p. 34-35).
This is as close to Buber’s idea of the ineffable nature of the I Thou relational space of love and empathy as I have ever come across being expressed in another epistemology – an epistemology I drew on in my Chapter Two. I am seeing here iterations of different cultural languages articulating inter-being – Four Arrows calls it instead worlding. These are expressions of a paradigmatic shifting vision that (some) education systems (which permaculture and eco-literacy designs are examples of) have set for us to challenge the ecocidally destructive forces.\(^5\) To refocus our education on inter-being and eco-literacy is intimately linked with ending this destruction. Joanna Macy “imagines that future generations will look back on this period and call it ‘the Great Turning’” (Macy and Brown 1998, p. 7). I would call Macy’s Great Turning an example of new emergent epistemologies we are witnessing in educational policy that seek to challenge the hegemonic (and often violent) ways of thinking that have colonized us. At a time when still approximately one in six people in the world “are suffering from hunger and illiteracy and the majority of them are in Africa” (Acker and Gasperini 2009, p. xi)– clearly the dominant forms of educational policy are not working, and new development theories and policies are needed to alleviate the suffering of the nearly one billion food insecure people (Ibid). This is the kind of curricular work that permaculture is engaged in, and that this site is engaged in, and which this dissertation (and particularly this chapter) are evaluating. Education for Rural People (ERP) – which FFS are a form of, and permaculture based FFS are an innovate example of, could be part of this educational policy toolkit. “ERP is one of the most powerful weapons against hunger” (Ibid.) – what this study seeks to explore is the ways in which a critical literacy approach that utilizes ERP builds such eco and social resiliency – with organizations like C-MRA and

\(^5\) Described in chapter two by the critical theorists, the embedded aspects of our civilization’s tendency towards cultivating and relying on death creating forces is described as the necrophilic civilization. A death loving system that our current educational practices socially reproduce (Chapter Two Section One).
permEzone which have explicit goals of alleviating hunger and addressing SDGs built directly into their mission statements.

This relationship between epistemology and curriculum runs deep. Four Arrows calls back in stark terms why we need to bring our attention back to this idea of a cosmos within everything – this deeper grounded correlational apriori. As Alan Watts put it “billions of years ago you were a Big Bang.” For, having gone out of tune with our deep story of human origin (Wilson 2019) and forgotten such basic aspects of what E.O. Wilson calls the Epic of Evolution (Ibid.) we have, consequently, as Four Arrows points out, now “managed to…(bring our planet) [to a]…a mass extinction” (Arrows 2019, p. 35).

A methodology that not only helps counter such epistemologies but that (and this is part of such epistemologies) also helps to elevate community voice and authority is critical to the frameworks I am working within (Tuck 2009; White, Blatz, and Joseph 2019). As the FAO note, ERP critically rests on elevating local abilities and skills in “research, knowledge generation and sharing, advocacy, policy and capacity development, as well as normative and field work” (Acke r and Gasperini 2009, xii). This is also in line with the latest findings from both the IPCC and an analysis of those findings by Kwauk written for Brookings:

The IPCC report emphasizes that social justice and equity are core aspects of climate resilient development pathways that aim to limit global warming to 1.5°C as they address challenges and inevitable trade-offs, widen opportunities, and ensure that options, visions, and values are deliberated, between and within countries and communities, without making the poor and disadvantaged worse off… In other words, social justice and equity are requirements for human society to achieve the Paris goal of limiting warming to 1.5°C. (Kwauk 2020, p. 16).

For such reasons the research questions I have proposed center around cultural components of improvement science (vulnerability and trust building at the core of NICs, knowledge sharing, ability to innovate with risk taking), and curricular impacts on consciousness and social behaviors and identities. To what extent did it work remains the
question. As a reminder – both at the individual and at the collective level the questions seek to understand to what extend such curricula and theories have helped influence:

- consciousness and ecopedagogy
- an ability to engage in collective action

Introduction

It should not be surprising that the journey upon which I set out with regard to my research interests and the actual research, and where that has actually led me, particularly given the co-creation nature of this participatory action research, are not the same.

Given this, I will use this introduction to reorient the reader to where I began my research arc, what the initial goals and purpose of this research was intended to be, and what the literature review offered as a guidepost for what the expected outcome of the cloth to be woven was based on understandings of the fibers and threads that were anticipated to be used in creating this fabric. Inevitably, as I learned to actually make it, and encountered the many other humans who were creating, harvesting, and weaving those fibers, threads, and cloth this changed my own understanding. I will do my best to explain those evolutions so that there is clarity in these shifting dynamics. The goal here is that as the initial and then emergent implications and importance of what this dissertation offers for educational leadership and particularly for educational policy as it relates to ecopedagogy, eco-based curriculum, farmer field schools, and Non-Formal Education (NFE), as well as forms of critical literacy, will be addressed as much as possible.

Initial Goals of Dissertation
The initial goals of this dissertation were to focus on a specific example of an NFE program that was occurring through a farmer field school (FFS) and utilizing a permaculture based curriculum. The hypothesis of this investigation was that such a curriculum would allow for an interrogation of ecopedagogy, not through a more academic and theoretical discourse, but rather through praxis, meaning – if we want to interrogate and investigate what the actual implications are of ecopedagogy are – then we have to find ways to see how it manifests as educational policy and curriculum informed by critical theory [that is the definition of praxis]. What are its impacts? What are the claims of ecopedagogy as a theory? As a curriculum [critical theory informed practice – so not just the technology, but critically and culturally rooted reasons for it]? Based on that – when we see it applied (and I think this is about as close to that as we can currently get) – what are the consequent changes to individual levels of eco-consciousness (RQ1), and subsequently to a group ability that is exposed to this curriculum to engage in collective action (RQ2).

Based on the wide ranging literature review I have conducted I was cautiously optimistic that we would witness at least certain markers for individual changes regarding ecoconsciousness. This was rooted in ecopedagogy definitions of ecoliteracy, a key component of an ecopedagogy curriculum. These included:

- biophilia - the love of life (Fromm 1973; Wilson 1984; Arvay 2018),
- conscientization within ecopedagogy (Antunes and Gadotti 2005; G. W. Misiaszek 2010; 2015),
- a way of thinking about the world and oneself as interconnected, what Thich Nhat Hanh calls “interbeing” (1987),

---

52 This idea has been contrasted with the idea of civilization, itself as a structure, being one that is built upon necrophilia, a death loving culture. This idea has been elaborated on by Fromm (1963) who also made explicit the contrasting idea of love to that of a death loving culture. Fromm concludes his work “The Art of Loving” by writing, “Society must be organized in such a way that man’s social, loving nature is not separated from his social existence, but becomes one with it. If it is true, as I have tried to show, that love is the only sane and satisfactory answer to the problem of human existence, then any society which excludes, relatively, the development of love, must in the long run perish of its own contradiction with the basic necessities of human nature.” To which he contrasts this in his final sentences by pointing out that “this need has been obscured…does not mean it does not exist. To analyze the nature of love is to discover its general absence today and to criticize the social conditions which are responsible for this absence” (Fromm 1956, p. 133).
the ways in which ecopedagogy interacts with issues of social justice (Freire, 2004)
and how it functions as a critique of civilization itself (Kahn, 2010).

These were markers I was on the lookout for within my descriptive findings for thematic analysis in chapter 4. In my discussion of findings below I will explore which of these did/n't emerge, and to what extent, and explore some of the implications for this within the context of the impact of this case study for an ecopedagogy curriculum. What this suggests about this example of such a curriculum, where it seems to be working better, where it is falling short, and where it would benefit from improvement, as well as some suggestions for ways in which to improve upon it.

Where FFS Ecopedagogy Curriculum is Succeeding Most in Western Kenya

Addressing Critical Literacy

As was noted in the introduction to this dissertation, "much of NFE in the Global South became used for the purpose of adult literacy with the specific aim of “technology transfer” (Chambers 1997; Defoer 2002; Najjar, Spaling, and Sinclair 2013) – meaning the purpose of such literacy campaigns was to ensure a minimal threshold of literacy by adults so they could implement the demands of big-agricultural industry for growing and usage of technologies that were perceived to aid in the development of GDP vis-à-vis cash crops (for example)." This then typically included implementation of converting small scale villagers into monocultural growers using synthetic fertilizers who would lose the ability to maintain

53A fictional accounting of this viewpoint that is based on research but written in narrative form can be found in the best-selling trilogy Ishmael by Daniel Quinn (1992)
diverse crops and food security without needing to be in a cycle of purchasing both synthetics and other foods to have a healthy diet (see Chapter Two sections two and three).

Many farmers when exposed to the ecopedagogy curriculum in Western Kenya via FFS also discussed engaging in cash cropping, so did this NFE fall into the same trap? Or was there a different context? If it did fall into the same trap, to what extent, and were there also (perhaps paradoxically) also other markers indicating success of additional aspects of the intended curriculum of the ecopedagogy framework? These are among the questions I will examine in the following sections of the findings.

From examining Research Question 1 – which focused more on individual impacts of the curriculum, I get a peek into the impacts of the intended curriculum as an attained curriculum after implementation. As noted in Chapter Four – the first emergent theme was around "inter-being and its relationship to Networked Improvement Communities (NICs)" which speaks directly to how this ecopedagogy curriculum impacted changes in consciousness and ecoliteracy (particularly beyond a technical literacy).

There are two parallel tracks to how I'd like to explore the curricular impact the ecopedagogy curriculum.

The first is within the framework of critical theory, considering the outsized importance of this philosophical framework in the literature review. Rooted in this framework is the ability to name a phenomenon, reflect upon it, and then act upon it. Ideally, within the critical attitude to such reflexivity, includes an ability to engage in creating new imaginaries for possible futures – the idea of hope. This will be the first manner in which the curricular impacts are explored.

A second framework in which I will analyze the findings of the curricular impact follows a different logical unfolding. This analysis is rooted in considering how permaculture
technologies (a thematic theme) that farmers embraced led to their ability to engage in a form of regenerative agriculture (a second theme) which they embraced utilizing a systems thinking approach (a third theme) by engaging in biomimicry and other forms of interconnected and interdisciplinary approaches that speak to, among other things, a love of place (a fourth theme). This allowed farmers to achieve resilient systems (a fifth theme) that are adaptive to climate change (a sixth theme). This logical flow will help maximize many of the connections between the thematic descriptions that emerged in chapter four. Between these two framings a deeper analysis can be offered. This will also provide a basis for considering where the ecopedagogy curriculum is failing, where it can improve, and how.

I will now move on to the first framing, regarding the critical theory lens, by beginning with an exploration of some of the ideas around the critical theory, and then going on to an exploration of the biophilia and NICs and how they relate to this.

A few reflections on the structure of this discussion as it relates to critical theory

Per the introduction to this chapter – the focus of this chapter is a discussion of the findings. Since the focus is on contributions this dissertation can make to educational policy and leadership, particularly around insights for ecopedagogies potential curricular contributions and other educational policy implications. As such, I will not be dividing this chapter based on the themes that emerged from each research question. Rather, I will be taking those threads, seven from the first research question and three from the second, and using those ten threads to weave together the fabric that will help create the tapestry needed to explain questions around the educational policy and leadership dynamics and curricular questions related to this dissertation. Many of the categories and subcategories titled below
will follow the names of the themes (threads) from the fourth chapter to help the reader follow – and I will constantly reference those threads explicitly, but I will also introduce other nuances, and be weaving in other ideas from the literature review to unpack the findings further, so I am not sticking to a purely parallel scaffolding between chapters 4 and 5. I will however offer as much guidance to the reader as possible to make this final chapter easy to navigate.

Biophilia, NICs, and Critical Theory: The power of imaginaries to create change

In the introduction to this dissertation I commented that a major epistemological contribution of ecopedagogy is that it develops critical theory further, into the realm of systems thinking and ecology, by pointing to various intersections. This includes an approach to NFE and adult literacy that requires going beyond adult literacy simply for technological literacy (where asymmetries in power get perpetuated and can then be used to get other adults who learn thresholds of literacy to implement a new desired technology or consume a new product). Rather it requires striving for more liberatory and transformational goals within the human being and the communities in which their lives gain meaning. Such a transformative approach aims to “empower individuals and communities by adopting socio-cultural models associated with contextualized and multiple literacy practices, valuing of the ‘other’ and a strong critical element” (Maruatona 2008, p. 745). For critical theorists, the word critical has an important meaning, beyond simply meaning “critical of” in a theorizing manner. Rather, “this (the word critical) is powerful and important only if the critical thinking leads to action” (Abendroth 2009, p. 6), what is called praxis in critical theory. Praxis means actions that are informed by deep understanding of how theory and history intersect in nested problems, creating a literate citizen, someone who is able to correctly name phenomena and therefore act upon them to facilitate change (Freire and Shor 1987)."
This means that an ecopedagogy curriculum should see markers of a liberatory pedagogy, praxis. The idea here is that human-animals are historically constituted beings, and that critically conscious humans become political animals capable of changing their worlds via informed action (praxis). It should see not just content around biophilia and NICs for example as a theme, but evidence that such ideas are being put into practice (praxis). To what extent is there evidence for this in the photo-voice data?

The answer, rather simply, is: a lot.

Villagers not only spoke very explicitly about linkages between living systems, and often living systems and themselves, but also did so while pointing to evidence of their own intervention in helping to cultivate such regenerative systems in photographs they shared. For example, Emmanuel Wao points to how intercropping "helps me to slow down soil erosion" which they learned "after permaculture training." They also note relationships between water, land, temperature, and retaining organic matter when discussing mulching and why this helps "keep the soil cool" as well as recycling cow manure to "keep nutrients in the soil." This kind of thinking exemplifies both a systems approach to regenerative agriculture, but also an adoption of technologies that are not rooted in monoculture, speak to thinking about ecosystems are interrelated, and show an immediate intervention by Emmanuel Wao to engage in praxis.

They were actively engaged in praxis, as they engaged in reflexive commentary on this practices. Many comments also reflect that the photos they share, as well as the stories commenting on them, reflect a change in both their thinking and their behavior rooted in an understanding of a theory/system driving it. This is definitional to how critical thinking and theory are supposed to work. Most of all perhaps, is that critical theory requires the ability to
create new imaginaries (G. W. Misiaszek 2020) – if all one can do is deconstruct a space it is not critical thinking – in fact it is considered naïve consciousness if one is not able to offer new imaginaries that have hope and love embedded in them (D. Y. Epstein-HaLevi 2019).

The villagers in the photo-voice data often exemplify, after offering such descriptive evidence of their awareness of interconnectedness and demonstrating their enactment of changed behavior regarding these systems, many villagers take the next step to speak towards a desire for a new imaginary. This speaks to a very high degree of accomplishment for FFS utilizing permaculture as an ecopedagogy curriculum as an innovative educational policy.

We can also see with Emily Oslo how, even when the purpose (at least partially) of the adoption of such farming technologies is to create a cash crop, it is also tied to aspects of biophilia, interconnectedness, and praxis. For example, Emily Oslo speaks about raising cash crops, but then immediately also goes on to speak about why adopting regenerative practices are important because this provides meals for her family and long term food security because it "also improves our soil to be healthy and fertile." These comments are made as she points in a photograph to newly created beds of intercropped vegetable beds, full of kale, sweet potatoes, onions, cassava, and other crops utilizing the regenerative practices she has learned, demonstrating praxis.

In a moment I will return to evidence of how this educational policy, implementing an ecopedagogy curriculum via FFS permaculture utilizing NFE in Western Kenya, has impacted both individual and collective levels of consciousness and praxis. Particularly I will move on to discuss how not only did villagers demonstrate an ability to move beyond the content with their attained curriculum into praxis, but also to the more difficult aspect of building towards collective impact (a concept that will be further explored under RQ2) as well as creating new imaginaries. Before engaging in this aspect of the discussion however, I’d like to return to an idea from the literature review around biophilia, and ideas that theorists
suggest its exposure can have on consciousness, and how this relates to potential anticipated impacts the curriculum may have.

**The ecopedagogy curriculum: The role of biophilia in cultivating wisdom and capacity for new imaginaries**

As noted by Gardner (2011) one of the multifaceted ways to think of human wisdom, is via our capacity to tap into our relational existence to nature/other species (Gardner, 2006). As pointed out in Chapter Two Section One, many philosophers within comparative religion, education, and philosophy have noted how "wisdom" as a category of philosophy and ethics often is rooted in human activities in which relationships with nature are cultivated, awesome experiences are had (such as interacting with a desert, mountain, or stars that humble the human being) and a perspective taking ensues that creates a new kind of human consciousness. As I noted in Chapter Two, "if we define wisdom not only as the collection of knowledge and facts, but as a synthesis of those data into meaningful forms, then our ability to be critical, reflective, and interpretative are fundamental to our capacity to foster wisdom."

It makes sense, in light of this framing, that with an increased biophilic disposition from an ecopedagogical curriculum, that an increased Freirean consciousness, an increased critical thinking capacity, including one that has the ability to imagine new possible futures, has awakened in the adult learners who have participated in this learning. This capacity for examining new imaginaries by participants, as a function of the exposure to this ecopedagogical curriculum, is what I will explore in the next subsection.

**Cultivating new imaginaries: An attained success of the ecopdagogy curriculum**
Moving beyond praxis, to the last piece of the intended curriculum of an ecopedagogy curriculum around ecoliteracy, would be the space around hope, if learners would arrive at imaginaries. This happened. It manifested in multiple ways, but most commonly it was rooted in statements around a desire for a call to arms of sorts, a witnessing of power that they now saw in themselves to enact change (praxis), how this was impacting others, typically their family and neighbors, and the insight that if others joined in this effort collectively mass change and new possibilities existed. Mind you these statements around hope and new imaginaries are made during a pandemic, and often awful droughts caused by human-made climate change that were wreaking havoc on farmers, creating hunger (which was mitigated for the farmers who underwent this training as a result of their learning these regenerative techniques). This speaks very well of the impacts of permaculture FFS utilizing NFE as a space for educational policy to explore for elevating the possibilities of ecopedagogical curricula. I believe that such decentralized and place-based forms of critical learning could have meaningful contributions to make to the educational community, particularly in the times of mass extinction.

I will address the generalizability of these findings in a later section of this chapter.

Turning to an example for this praxis of new imaginaries, Emily Oslo specifically links the modeled behavior and knowledge they are bringing to a capacity to create mass change. She notes how her neighbors are beginning to notice what is happening and want to learn from them. "My neighbors also, when they need to learn to grow food like this, they come, and I assist them as they learn." Emily Oslo has become a teacher herself of this new curriculum now. She is not only spreading her knowledge, but literally the praxis, giving the seeds of these newly acquired diverse crops to her neighbors and teaching them how to implement ideas around regenerative systems approaches. "Sorry I had forgotten about kale, I have some in the seedbed, and I will give some to my neighbor also to transplant so that they
can also have." This statement accompanies a picture of her neighbor learning how to cultivate their own new beds of intercropped foods.

![Image of Emily Oslo's neighbor intercropping](image)

**Figure 16: Photo Emily Oslo 2**

*Emily Oslo's neighbor, having learned from her, is now planting using intercropped methods*

Biophilia – a love of life – as noted in the chapter two literature review is also related to a love of place(s). This should show up in pride of local community. This was apparent in a number of ways, most of which are in the visual data, not the voice, though there are examples of it in the voice as well. Phillip Ojwang Wao for example speaks about how "we should work hard to grow local vegetables" and "use methods based on local resources for fertilizer like animal manure rather than synthetic fertilizer" (again demonstrating that the technical literacy is *not* about adopting agribusiness models of development for capitalist benefit). There is a vision embedded in this statement – a desire to create a different future, and it is rooted in a belief of what can be accomplished if "we work hard together." Phillip concludes, based on this imaginary for a better future that they are "happy with the group"
and have "received valuable training."

Figure 17: Photo Phillip

Phillip shows off her family working the land together as she shares an audio enthusiastically calling for others to join forces to learn how to farm in ways that are kinder to the Earth, and create more food security for families. Notice the intercropping, and the growing along contours, not imaginary square rows, utilizing the land's shape to help retain water and soil.

This love of place and a desire to impact change was also channeled by Phillip who declared "I am urging us to have a strong energy" so that "we can see how we can shield hunger and have other development" which Phillip – per critical theory and the creation of new imaginaries declares "will keep away problems that may try to come our way." Indeed, Phillip not only names certain problems they can already grapple with, but not has the confidence to declare, that with their collective power, they can figure out solutions to whatever problems may come their way. That solutions exist locally. This is a penultimate example of local empowerment and imaginary. Monica similarly spoke of a desire to bring
their market to a "cooperative society" – pointing to the imaginary of building collective power – and to move away from the normative market practices that surround them. Monica articulates this very explicitly when she states "that by working together "we can better help families."

A Second Framing for Exploring Ecopedagogies Successful Curricular Impact: Permaculture technologies, alternative development, and fostering resilient systems

Agriculture & Development: War or peace? The permaculture curricular offering

In Chapter Two Section Two an exploration of what permaculture as an intended curriculum was presented. A central text from many Permaculture Design Courses was often highlighted to demonstrate some of this content citing from Bill Mollison's "Permaculture Two" – a widely cited reference for such work. Mollison notes that, “I regard permanent agriculture as a valid, safe, and sustainable complete energy system” (Mollison 1979, p. 1) already indicating the interdisciplinary nature of the curriculum he has in mind. As I wrote in chapter two, "he notes that in dominant languages such as English are conceptually weak with the vocabulary needed to address the patterns nature permaculture seeks to emulate (Ibid. p. 3). Mollison understands that his project reflects more deeply a way of thinking and being, a way of change, “(this text) then is not about design, gardening, livestock (agriculture) per se but as elements in a system intended to serve people, and the ends of good ecology” (Mollison 1979, p. 2). Reflecting this philosophical prism with which permaculture approaches agriculture, human settlement and ecology he asks, “What can I demand of this land to do? Or – What does this land have to give me? – the first leads to a forcible rape of land by machinery, and the second to a sustained ecology…It is war or peace” (Ibid.).

If ecopedagogy can be interrogated as an educational policy via a permaculture curriculum delivered using NFE in FFS settings, as this dissertation posits, then the implemented and attained curriculum should bear witness to this. That should mean that
another indicator of this implemented curriculum should be changes in attitudes and philosophical orientations around relationships to land. As Mollison very bluntly puts it, the question becomes "what can I demand of this land to do? Or what does this land have to give me?" – One will lead to humanity at war with The Earth54 (Kempf and Palast 2008; Kolbert 2014; Klein 2015; Kovel 2007; McKibben 2006; Wallace-Wells 2020) and the other will lead to an ability for humanity to live in flow with Gaia (Wordsworth, Coleridge, and Stafford 2013; T. M. Alexander 2013; S. Alexander 2013; Macy, Halifax, and Hanh 2021)– to "a sustained ecology" – it is war or peace.

So within this spectrum – where did the farmers in the village land with their attitudes to land and development after exposure to an ecopedagogical educational policy as implemented via a permaculture curriculum?

Cash crops, interbeing, and resiliency – impacts of ecopedagogical curriculum

In Chapter Two I went over that cash crops still play a major percent of more economically poor nations GDP (Davis et al. 2012). Agriculture accounts for 29% of GDP in developing countries and for 65% of their jobs (Pye-Smith 2011). Yet technologically driven agriculture has not generated wealth for most peasants (Larsen and Lilleør 2014). We've seen how this alternative development model in this case study, while not developing wealth per se, has developed resilience and security. And whereas capitalist forms of agriculture have increased farmers abilities in other spaces to raise cash crops, they have not improved access to nutrition, not improved stabilizing against starvation, access to health care, or access to

54 an articulation of our planet as an object – we commodify even the place of our birth – see Greg Misiazek's Ecopedagogy for a treatise on this idea
basic calorific/nutrition needs (Mukiibi 2001; McCleary 2016). While we don't have metrics on the outcomes in this case study, as noted throughout the narratives provided in this photo-voice, and as evidenced by the neighbors responses (teach me how to do this, or their coming to these farmers for food because they didn't have any, but those who used the permaculture during the drought did) it is reasonable to conclude that this did have impact on avoiding starvation, and we do know that the crops they've introduced drEmily Oslotically improve nutritional availability over what was bring grown (e.g. kale, pumpkins, ugali, banana vs. cash cropping maize).

Beyond this, there is a high degree that indicators in the curriculum related to Mollison's notion of "what does this land have to give me" vs. "what can I take of this land" are present regarding a behavioral disposition in favor of interbeing. This is evidenced in the ways in which farmers, when discussing cash crops and manners in which the land can create opportunities for them, "the cassava that we have planted when we harvest we eat and it gives us nutrients" (Jerry Wao) or "Cassava is a cash crop…it will be harvested and we will sell part of it to give us income" (Ibid.) also state "Pumpkins are a vegetable. It is also taken to the market to generate income. The roots and soil cover also helps in controlling soil erosion." (Ibid.) Jerry Wao of all the farmers was one of the most focused on making sure they grew crops that could be used to help generate income. Yet even in this case, there was a clear awareness that to only take from Earth was wrong, that there must also be a deliberate awareness and intention to attend to Earth, to give back, to interweave threads, to build the soil, to prevent erosion. This attitude to regenerative agriculture (permaculture) speaks to interbeing, and the philosophical foundation of ecopedagogy.

How did farmers achieve these gains? How were they able to figure out ways to attend to both their own needs in ways that also were attentive to the needs of other beings
and Earth? This is regenerative agriculture and as Mollison points out is via an attentiveness to systems thinking as applied to ecology. This requires both a systems thinking approach and a skilling up with technologies rooted in permaculture.

Lucas Raute mentions such a technology around mulching. Whereas before they would "get low returns" [with kale, and generally with vegetables, which is why most farmers avoided this high risk and high input crop] they had experimented with it once "before I knew anything about mulching." But "since I was trained on mulching – the technique has helped me ever since. Even during the drought, the vegetables are good and this has enabled me to sell to my neighbors when they have almost no vegetables on their farm" (Lucas Raute).

![Figure 18: Photo Hermann 2](image)

*Hermann showing off his kale crop: notice the pile of mulching material to his right that he is preparing to add to the kale plants that need to be re-mulched. Notice also the intercropping with the kale plants. These plants were grown both during the pandemic and a drought.*
Note how much is in this data. There is an implementation of technology. That technology is tied to regenerative agriculture in the spirit of the philosophy underpinning ecopedagogy (what can this land provide) and it creates a systems approach that spreads out in providing for human needs not only to Lucas Raute, but to their entire neighborhood. It creates resilience (it is resilient even in drought, which is becoming more common because of climate change). This one example shows just how impactful this simple technology is. It allows for a highly nutritious crop to be grown, to alleviate the need to purchase foods, and to create a more food secure system.

Lucas Raute is himself aware of all of this. "Since - later - I did mulching - the crop would stay longer. Alright now it is almost getting over this crop has helped me for quite a time. I have realized that it is good to do mulching and that makes work easier, mulching controls weeds, conserves the soil moisture, hence it doesn’t evaporate, it makes crops healthier." They even note "I am happy to be a member of research in Asumbi and I am hopeful you will bring more technology that will assist us in our farming activities." This shows reflexivity. That means this is meeting the Freirean definition of critical thinking, an ability to name, reflect, and act upon a situation. I already discussed above the final and most critical step, to maintain hope in the middle of critical and difficult situation and create new imaginaries. Lucas Raute fits all of this criteria. In this example, the assessment when asking to what degree is an ecopedagogy curriculum meeting the intended curricular goals? It would be hard to point to ways in which it isn't.

John Leonard experimented with creating swales. A classical permaculture design, and a very labor intensive one. I have published previously with members from this team and other local practitioners in Kenya and Uganda, as well as academic experts on ecopedagogy on the transformative practice that water catchment can have on restoring local ecosystems (see: D. Epstein-HaLevi et al. 2018). This is a technology that literally has the capacity to
slowly turn human made deserts back into semi-arid ecosystems that have the capacity to support a much more diverse ecosystem. However, the upfront labor cost for this requires either an extremely dedicated individual, or collective effort. John Leonard was one such individual, and the ripple effect he created was immediate. Swales are a technology that raise the water table by trapping runoff of rainwater (See Figure 2 below).

Figure 19: Swales

By building up an area along the contour of the land to the same elevation (see the figure 2 above) you can prevent mass erosion and run off of water along a graded land, forcing the water to go underground instead of rushing down the slope due to poor topsoil and root systems from overgrazing and human abuse. Consider that in some of these areas humans have been practicing pastoralism for upwards of 10,000 years (Galaty 2021). This allows the water table to be rebuilt. It makes the trees and human crops more drought

---

55 From https://leafninjasmission.wordpress.com/2012/02/25/swales/
resilient. This indicates a systems approach, and a deep attachment to land, a rootedness. A 7th generation approach, as it is a rebuilding of land harmed over generations, and a commitment to rebuild it for future generations. As John Leonard began to reap the benefits, he points in his pictures with great pride to all the plants returning to the land and states, "this is my food forest!" He then points to the technology that enabled this diversity of life to come back "Here there is a set of swales that I am pointing to. This divides my farm in two. It has helped me in seeping the water into the ground which enables my farm to produce food." John Leonard has connected the production of food, his ability to create cash crops, and a profound attachment to land, to rebuilding water tables, and to passing on a healthier Gaia to future generations, while rebuilding a regenerative ecosystem. Beautiful. I was humbled when I saw this, the amount of work, dedication, and love this required. So were his neighbors, "so many people have been asking me how I got these skills" and how so much diverse life suddenly came thriving back into his farm. "I am telling them to join our group so that they can (also) be trained." The power of collective action, and the merits of this theory of change are bearing fruit.

Emily Oslo also points to a systems approach to regenerative agriculture, that creates cash crops, food resilience, protects against drought, implements indigenous wisdoms for growing food, and is rooted in permaculture technologies that are resurrecting lost wisdoms from ancestral practices. Emily Oslo has begun using hugekulture – a form of farming where fallen trees and other wood are planted underground and mounded. The wood will soak up water and hold it during drought and slowly release it, allowing for crops to survive dry spells, making them more resilient to drought and climate change. The wood also breaks down over years releasing nutrients into the soil, helping to rebuild the soil and helping eliminate the need for synthetic fertilizers. Like swales, there is an upfront labor cost to moving large objects, but once done, it lasts for many years, even over a decade.
Monica shows an example of hugelkulture being used here, with woody products or limbs being used as a layer, followed by a small amount of earth followed by the mulch. The baby plants are put into this and will be nourished by the soil which will also be fed and watered by the rotting wood, which will be full of microorganisms, fungi, etc. Such a bed can be reused many times without losing its rigor or any need for synthetic fertilizers.

Emily Oslo talks about "me as a farmer" and that "I felt good" when describing her ability to accomplish such a feat when reflecting on this flow with and mimicry of natural systems and moving away from a reliance on money to buy synthetics. She also introduced intercropping to support nutrients in her soil – much like the common three sisters grown in New York. This exemplifies a systems approach and a concern for her land.
Valentine offers another example of narrative where a linkage between a technology – in this case composting – is linked to an aspect of biophilia – the ability to have healthier soil "you don't need to go to the shop to buy synthetic fertilizer" and then spray "poison" to grow "vegetables." It is no surprise that Valentine has photos of him smilingly pointing to "my food forest" and speaking about "this is my papaya" and "this is my banana" and giving a tour with pride about his land, his trees, his home. All rooted in what he has learned, technologies (like swales and inter-cropping) that he has learned, and a living system that he has cultivated and brought back to life that now provides for all manner of other life, a living soil, a healthy water system, and as a consequence, also his family and increasingly his entire neighborhood. The agricultural aspect of development, both for the purpose of cash crops, and for the purpose of creating more food security and resilient food systems, is directly attached to regenerative technologies and sensitivities towards an interconnected planet that includes human beings. It speaks to Mollison's "what does this land have to offer me?"

On a Love of Place(s) and the impacts of an ecopedagogy curriculum

Importantly I am also noting here a key component of "loving places" covered in Chapter Two Section Two – particularly around ideas noted by Ann Pelo. To recall some of Pelo's offering's - the basic idea was that if we are trying to push a curriculum about Gaia and loving all places or ideas around interbeing, for example – loving the oceans – without the capacity for a local population to fall in love with the river that runs through their city or village – this idea will fall flat.

Pelo discusses six principles that she believes engender a critical ecopedagogy in people: walking the land, learning the names, embracing sensuality, exploring new perspectives, learning the stories, telling the stories (2009). I would argue the farmers in
Asumbi who were exposed to this curriculum are engaging in all six to at least some degree. They certainly have always walked their land, but now they are also learning many more names, of indigenous and native plants for example, we have seen through chapters 4 and 5 and embrace of sensuality (though this is also part of the critique and where it could be improved), and the last three are at the heart of the entire data.

We have to have specificity first. First we love one other person – say our mother(s) or father(s), then we learn to love a wider family or friends, a tribe. Let alone the concept of humanity. We can’t start with loving humanity. We have to love self and then one other first. Mother, father, brother. The same holds true for place. This is a critique of how curriculum regarding teaching love and place in ecology and climate have been approached, where the systems attitude has often tried to teach something so broad and global that there is no feeling to it, it becomes nearly impossible for people to relate to. As Brene Brown points out, humans like to think of themselves as thinking beings who occasionally feel, but the reality is based on all the neuroscience that we are feeling beings who occasionally think (Brown 2012; Bessel 2015). What we are seeing in the above, both in the voice, but perhaps even more so in the photo evidence, is a love of place(s). The voice speaks to a specific attachment to their land. "This is my food forest" says John Leonard. "This is my farm" says Phillip. "This is my farm" says Lucas Raute. The word "my" appears 55 times in the voice recordings. There is a sense of putting a stake in the ground – and that should not be surprising for farmers who are cultivating land for themselves, their families, and future generations. In the pictures that accompany these narratives are pictures with smiling faces showing off the land they have worked, often pointing to a parcel, a crop, or working with their neighbors, children, even newborns.
Figure 21: Photo Eunice

Eunice with one of her chickens in background free grazing (a permaculture technique wherein they can be penned in an open field to fertilize an area to be used in the future for a crop) – having spoken to the benefits of these new technologies in providing for family and creating more security.
Figure 22: Photo Emily Oslo 3

Emily Oslo joyfully describes working her land with her infant daughter – tending to a drought resistant crop newly introduced via the FFS training. Note there is no mulching (another technology that was taught) yet in this photo. This was earlier in their implementation – a later photo has the mulching being implemented as they engaged in their own feedback loops – discussed later in this chapter.

The data demonstrates a love of place. From this, as Pelo argues very powerfully in the literature review, can come a broader love of places – an ability to fall in love with Gaia – an ability to understand biophilia and interbeing more deeply.

User-Centered Systems Design, Resilience, and Critical Literacy

In Chapter Two Section Five the idea of a user-centered approach to design was introduced. This was rooted in an intersection of both systems theory, as well as critical theory. As I wrote in Chapter Two:

The Harvard Educational Review editors in an introduction to an essay by Freire note that his approach to literacy is about the ability to understand “codified representations of the learners’ existential situation” which leads to “awareness of their right and capacity as human beings to transform reality. Becoming literate then means far more than learning to decode the written representation of a sound system. It is truly an act of knowing through which a person is able to look critically at the culture…and to move toward reflection and positive action upon their world” (Freire
1970b, p. 205). These ideas are closer to the theoretical frame of literacy found in agro-ecology based FFS—and fits closely with the conceptual framework of ecopedagogy, which emerged from such critical theories. To Freire this is the critical difference between animals and human-animals. Human-animals based on an orientation to the world have the capacity to transform it – through language we have become historically constituted beings who thus have “a value dimension” (p. 206). To Freire this is the key to his term praxis: critical literacy means a deliberate, conscious, orientation to the world where how we code/decode is based on values, and a desire to impact positive change as we negotiate between our theoretical understandings and our behaviors. Importantly, critical literacy also takes issue with those who view “illiterates” as being in need of “food” – a “banking system of education” in which knowledge is seen as the prevue of the teacher who will deposit it into the empty minds of the poor and illiterate. Freire (and ecopedagogy) take the view that literacy must emanate from a co-production of knowledge co-production that is owned and valued by learners and educators as much as anyone else.

This should mean that the data should indicate that farmers are feeling empowered to create their own data, to be researchers, to discover knowledge themselves even when they don't (yet) know the answer to a problem. It should mean that farmers are feeling empowered as creators of knowledge, and seeking resilience in their knowledge systems, and in their systems in general that given them security, which for many in this case would mean food above all else. There is meaningful evidence to these ideas in the data.

John Leonard for example notes with pride the avocados that he is growing. He can be seen in the photos he shares pointing with a smile to his new crops he has learned to grow. You can hear the joy in his voice as he shares the audio describing his avocados. He then begins to explain a disease he is noticing on the leaves, and that he is not sure what is causing it. He is describing himself as a researcher, and perhaps more importantly, as a creator of knowledge when he declares, that even though he does not yet know what the problem is "I will find out their treatment." He is no longer reliant on others for knowledge, and is refusing banking education. John Leonard is the source of knowledge gathering and integration of ideas from others and will decide himself who he trusts, why, and how he wants to proceed. "I will" says John Leonard. Lucas Raute also describes being happy "to be a member of research in Asumbi" describing himself as a member of this team – a co-creator of
knowledge. Emily Oslo notes that "we have learned very well" and wants to continue doing so – there is a thirst for this knowledge which has allowed her to help her neighbors (she is teaching them – becoming an active participant in offering knowledge and co-creating) "my neighbor also, when they need (to learn) they come, and I assist them."

The form of teaching offered, both the pedagogical style and the content of the permaculture curriculum via this NFE adult literacy in a FFS permaculture course, have demonstrated another set of indicators of an expected ecopedagogy curriculum not only via the intended curriculum, but the attained.

FFS in East African (Changing) Climates – Avoiding Solutionitis: Empowering Local Voices

In Chapter Two Section Three it was noted that there is a wicked problem facing agriculture in Kenya which is comprised of a number of factors:

1. the division of land into very small tracts due to colonial laws (which helped to diminish power among indigenous populations)
2. rapidly changing microclimates (as compared to Asia where FFS and monoculture were more comparatively successful)
3. an ancient space of human settlement (indeed, the cradle of humanity) as well as a cradle of human pastoralism and cattle raising, meaning the soil has the potential for degradation/erosion and may need regeneration. Much of this also has to do entirely with modern and rapid exploitation. For a powerful story behind this, watch the following story on being like the hummingbird as told by the great late Kenyan Nobel peace and eco activist and storyteller Wangari Maathai

It would be easy to come into a space in Kenya given this and approach it with solutionitis, a set of solutions to such a wicked problem, before properly understanding the nuances of this complicated system, especially as it manifests in any local context. An improvement science (IS) framework, and a participatory action research design, which this dissertation aims to incorporate, would mean that the data demonstrate an elevating of voices by the participants in the study, who help to identify what the actual problems are, and how this complex problem is manifesting in this local context – and what they believe and think potential
solutions may be, with reflective iterative ideas about those ideas as they gain feedback from their initial hypothesis. An ecopedagogy curriculum should reflect an adaptive content that is responsive to those voices.

There is mixed evidence for this in the data.

Many of the villagers identified climate change as a primary problem they are facing. They expressed this typically by pointing to periodic drought as a new problem that they face with increasingly unpredictable rainfalls (normally they could count on a regular biannual rainfall pattern). The other major problem villagers pointed to was food insecurity, and behind this was a need for capital in order to supplement their needs – most often for additional commodities, or for advancement (such as education) and lastly for development.

How did the permaculture curriculum respond to this adaptively?

On the whole, very well, with room for improvement. The areas that could improve will be addressed in a separate section.

Permaculture explains in its content that a major reason for intercropping and mulching is that it can reduce erosion, help retain water moisture, and make crops more resilient to drought. A lot of the curriculum that was delivered pivoted to a focus on drought resistance. This included focusing on cultivating and introducing seed stock for either new crops, or reintroducing lost knowledge of local crops that are naturally drought resistance, as well as focusing on technologies for making any crop more drought resistance. Given the pandemic being able to increase self-reliance and have more food security became even more important because regional movement often became illegal and was shut down; villagers could no longer be certain they would have access to other markets for purchasing necessary commodities. Those who adapted with drought resistant crops and had more local food security during this ongoing pandemic had a definitive advantage in avoiding hunger.
Because of the villagers buy-in for finding ways to make their farms more drought resistance there was a lot of enthusiasm for this curriculum and a lot of fidelity for learning how to implement this technology.

Recalling from earlier in this dissertation the importance of trust and vulnerability to get at more difficult data in narrative, one must consider if "enough trust and vulnerability [have] built up in order for people to take risks and engage in the process? The question remains, will we see favorable outcomes for collective impact from these FFS towards impact on regenerative design based on permaculture and ecopedagogy?" This was the open ended question I had posed earlier – and the answer at this point seems to certainly lean to yes. Evidence to this I had posited would be exemplified by:

1. attitudes that solutions exist locally (I have demonstrated this)
2. information has a social life (it isn't just technical) (I have partially demonstrated this)
3. the best way to ensure uptake of solutions is by including the voices of the local experts and using a PAR approach "‘internally developed solutions [that] circumvent rejection triggered by a solution deemed ‘foreign’" (Pascale, Sternin, and Sternin 2010, p 107) (I have demonstrated this).

The question to me remains, how did Paul accomplish this level of trust? I will return to this a few sections below.
Phillip offers a good example of this when speaking to intercropping (planting different crops together), "The maize will mature first and then will remain with the cassava. This will help during drought and help in so many ways as it can be used in preparing porridge, ugali, and income generation." [It helps during drought because it is offering a cover crop and helps to retain water and prevent evaporation]. Phillip explain these linkages "Mixed farming and intercropping [a permaculture technology making use of ancestral and indigenous practices] is really good as this keep away hunger, poverty, and many other things that bring human suffering."

Jerry Wao also brings attention to the importance of mulching because of drought. While pointing to his cassava crop in a photo Jerry Wao notes "the cassava has been mulched. Cassava is a drought tolerant crop…mulching helps in conserving soil moisture [again pointing to a permaculture technology]." Jerry Wao then goes on to describe using intercropping with vegetables like pumpkin that will create a cover crop in order to "control soil erosion because it covers the soil" while also pointing to his "bananas which are hardy and can survive in drought." Similarly, Lucas Raute notes that after using "mulching techniques" that the vegetables will survive "during drought" and "enables me to sell to my neighbors" when they have no vegetables." These farmers were hit with both a drought and a pandemic, one in which Kenya literally shut down all travel between regions/counties for a time. The farmers in Asumbi fared, all things considered, well given this. They had enough food that their neighbors came to them for support. That is a strong indicator of a meaningful differential. Again the understanding of the technology to the local problem they have identified between climate change, drought, their treatment of Gaia (not the Earth – a thing, but a living organism Gaia) and this technology is clear, "mulching makes work easier, controls weeks, conserves the soil moisture, hence it doesn't evaporate, it makes the crops healthier." Clearly, many of these farmers have picked up on the importance of technologies.
and crop selections that increase their chances of having food security during increasingly unstable growing climates. Jerry Wao notes elegantly, "That is how I work as a farmer."

The Changing Role of Women in Families Upon Exposure to Permaculture FFS

This kind of food security is highly valued, and here we also begin to notice one of the gendered differences. Mostly women farmers mentioned kids, and this kind of food security was tied to the ability to make sure that their children had food. Given that women continue to represent the bulk of informal economies, which are less regulated and subjected to laws (UN Women 2015; Perrons 2014) and that women serve as shock absorbers during times of famine to children in the household, meaning they will eat less – having food security has major implications for women. When there is scarcity it is often the girls who will be expected to walk extra to find water, women end up missing out on school when there is food insecurity. **There are many subtle ways this plays out. So simply by increasing food security this is a policy with educational policy implications.**

It was noted in the literature review the classical impediments that women face generally, and specifically in Luo culture, to land rights (despite often doing the bulk of work in agriculture). The ways they are lacking a strong political voice/power in determining labor laws and economics of production (Aliber and Walker 2006; Budlender and Alma 2011; Francis and Amuyunzu-Nyamongo 2005; C. L. Miller et al. 2010; Yngstrom 2002). As noted by Due, Magayane, and Temu (1997 & R. Percy (1999) there have been hypothesis that FFS may address this, but it hasn't been studies. This case study does suggest that exposure to this curriculum addresses such asymmetries of power within a patriarchy. As Friis-Hansen, Duveskog, and Taylor's work suggested, male participation with women changed the family system dynamics around political and economic decision making. When including unpaid
labor, the estimate is that women were working 3x their male counterparts, without voice in decisions about that labor. And that planting and engaging in agricultural work is viewed as "women's work" (Najjar, Spaling, and Sinclair 2013). This is why men must be included in women's work for meaningful liberation movements (UN Women 2018).

In interviewing Paul, he observed that after exposure to the curriculum

several women after training were able to make decisions about what they wanted to grow, which they couldn't do previously, and make decisions about their incomes, which previously they didn't - it was a men's affair. I was able to see that by interacting with them, when we were having the meetings, we could see how they were now talking with authority and able to grow crops which previously they could not do this because the men were making decisions on what was supposed to be grown in their farms but now they could make decisions on their own and to decide what to plant. Not on the entire farm of course, but portions of it. During training we were talking about how when you use permaculture you grow vegetables and care about your family and ensure that everyone has nutrition and the surplus can be sold for expenditures and create resilience. So now the women became conscious of their income and concerned with it, and they tended to be very business minded and could sell surplus to the neighbors and what they earned they managed it themselves for their expenses. (Paul Omollo, personal interview January 12 2020)

While initially I had assumed that I would not be able to address at all the aspect of land equity and women's access to land/resources and how this impacts their likelihood of making long term generational planning more difficult given a lack of incentive when they don't have equitable power – this turned out to not be entirely true. As Paul notes, "I was able to see that by interacting with them, when we were having the meetings, we could see how they were now talking with authority and able to grow crops which previously they could not do this because the men were making decisions on what was supposed to be grown in their farms but now they could make decisions on their own and to decide what to plant. Not on the entire farm of course, but portions of it." (Paul Omollo, Personal Interview January 2022). After exposure to this FFS curriculum, women in fact did gain more power of land usage.
The permaculture curriculum, in attending to technologies that helped ensure resilient farms, that could grow vegetables reliably as a food source, even with a changing climate, were highly prized by the participants, as they could now reliably feed not only themselves, but their families, making them more self-sufficient, and able to make sure that "when I want to cook, I just go to my garden, and cook with it. When my neighbors, when they need, they come." Emily Oslo can rest assured that there will now be a regular harvest that she can "take to my kids to eat." Similarly, Monica, happily smiling in her photos and pointing to all her variety of crops then says as she describes the different crops she can harvest "I bring them to my children to eat. It helps the kids when they are hungry." For both women, there is enough surplus with this she is also able to sell some, have the extra money, and provide for her children "as I can sell to" have the tuition money "to educate my kids."

In these ways the curriculum has seemingly shifted what is the standard attitude where men are more involved in the political and systemic issues, such as solving local hunger and improving women’s contribution to agricultural labor, whereas women tended to focus on self-sustainability for the family, but didn’t typically engage in community or regional level political leadership to enable such changes (Duveskog, Friis-Hansen, and Taylor 2011). Some scholars as noted in Chapter Two guessed this may simply be because of the three fold labor cost to women in the asymmetry, they don't have time for politics. Either way, what we see in this case study is women's engagement in the local political sphere. They are engaged in decision making about the credit-savings accounts, in how the land will be used, in what crops will be planted, in how the money from the surplus sold at market will be used.

Improvement Science, NICs, and Collective Action: To what degree did Permaculture as an Ecopedagogical Curriculum have an impact?
In the Second Chapter Section Six, a lot of attention was given to components of not only Networked Improvement Communities (NICs), a particular component of Improvement Science, but also how collective action may build in a specific community. Various indicators for these were offered. This included what a positive deviance model may show, how indicators for high trust and vulnerability would be expressed, and markers for collective action. As a reminder, some of the key features of such a framework would include:

- a willingness to model failure, and iterative learning
- for positive deviance, there would be a modeling of behaviors on the margins (instead of a catering to the mean) that are extremely successful that others would mimic
  - this would also mean that there would be an embedded belief that solutions for problems are embedded within communities (knowledge can be created or co-created internally, it needn't be bought or brought in exclusively from experts externally)
- there will often be a more deliberate theory of change and theory of problem
- a problem is also viewed as the solution (an invasive species can be an opportunity if the right question is asked of it)
- all voices matter
- rapid prototyping
- a willingness to share knowledge (which includes affirming/validating knowledge between members, an ability to critique it, to share in benefits)\textsuperscript{56}
- Sharing failure means using data "like a flashlight, not a hammer" (Blatz interview)

\textsuperscript{56} Consider what a big deal this behavioral disposition is in a scarcity environment, instead of the common competitive environment and disposition we are so accustomed to
- Evidence of adaptive leadership (which includes holding tension, active listening, dialogue with participants, an ability to hold silence when questions aren't immediately answered)

For more detailed aspects of any of the above indicators or descriptions please refer to Chapter Two Section Six. So how did the permaculture curriculum as an ecopedagogical educational policy do? Mixed marks, but again, on the whole rather well.

Regarding iterative learning, trust building, the elevation of voices, and knowledge sharing it did particularly well.

Farmers were willing to experiment with ideas. During the workshops the facilitators demonstrated an ability to actively listen. When I joined two long workshops via Zoom I witnessed significant dialogue, all participants shared in voice, there were common and significant silences. Every single participant had voice. The facilitators did not force their way into such spaces when there weren't immediate answers. There was balance between the voices who answered across age and gender. People answered with laughter and a sense of light heartedness when problems weren't easily tackled by the group and trust was built up. The energy was more uncertain at the beginning of the meeting as a new person (me, and in the third workshop Colin) was introduced, but by the end everything was animated, people were laughing and using tones of voice indicating cordiality, familiarity, an energy of friendliness and comfort. Different ideas were raised, and participants voluntarily stayed nearly an extra hour to engage in initially in some question and answer and then just to talk with excitement about the upcoming project.

As the project unfolded and data came in from the field as the dialogue continued within the group, knowledge sharing rapidly increased. Instead of knowledge becoming a commodity to be hoarded, it was volunteered. There was clearly a sense of high trust
developing not only within the group, but more widely within the region. This most commonly took place in a direct manner where villagers who had received the training became active teachers themselves, engaging in direct training to others.

Bryk (2015) discusses the imperative of a kernel, that any NIC has to have a shared core idea/problem of practice that information is shared around. So the kernel resources for a NIC incorporate an agreed upon set of practical measures by NIC members so that they have a basis for learning from one another about what is actually working well or not as well or not at all. This means there must be a mechanism for such knowledge sharing (a regular meeting for example) and a shared problem (using regenerative agriculture to improve soil quality). In my interview with Paul he indicates the high degree to which this was manifested. Farmers had "spaces for communal knowledge sharing – they formed a self-help group on their own initiative – they meet on their own and discuss their development issues. They even have what we call a table banking – it's like a saving and credit account for members on a community level." This collective action has developed to the point the entire community is now pooling resources to join forces in a shared problem: "They collect money periodically like monthly and after collecting this money they put it in an account together and other farmers can borrow from this if they are members – and then he or she can borrow with a small interest and then this interest – at the end of the year everyone is given back their money they invested. The interest they have collected they now decide as a group how to use it." These joint community programs are means of raising the communities' standard of living. "This is used for group development projects, for example to buy chicks to begin chicken farming they share among themselves so everyone can begin chicken farming. They chose this because they can make compost out of the waste, eat some of it for nutrition, and sell some for income for their households." (Personal Interview, Paul Omollo January 2022).
In the final report that Paul wrote for permEzone and C-MRA after examining the data from the continuous evaluation feedback loops (see next section) from the farmers, as well as exploring some narrative stories – a further example of improvement science was illustrated: the use of positive deviance. In the final report, there is a descriptive list of the findings (detailed in the next section) demonstrating how the intended curriculum did when measured from a quantitative angle in regards to its actual implementation. What makes the final report more relevant to this section – is that Paul then chooses to highlight what he calls: "Success Stories" – which are positive deviants. In these success stories, specific farmers are highlighted based on particular skills/ideas around the curriculum they have particularly exemplified. These are farmers who took that part of the curriculum (say creating a food forest) and went absolutely above and beyond what they had initially been exposed to/learned and co-created. They went deep into this body of knowledge, learned more on their own, and implemented these practices (praxis). There is one couple and one woman highlighted among these positive deviants for three different techniques (sack gardening, food forest, and composting). These findings were shared with the other villagers, demonstrating to them what their own neighbors are able to achieve, and using their own local wisdoms/adaptations of the curriculum within a positive deviant model as a source of inspiration to encourage further implementation and experimentation among other farmers within the curriculum to explore what can work, for whom, and under what conditions.

To that end – as has been stated many times – a critical principle of improvement science is variability. In order to understand what is working – and under what conditions – we must attend to disaggregated data. So what was the variability that was revealed? This is what I will explore next.
Variability within the data

I had expected, as noted in the literature review, to find variability within the data, particularly as related to gender. Given much of the colonial, post-colonial, and patriarchial cultures involved, it made sense to expect some gendered variabilities. It also made sense to expect some kind of variability around age to be expressed. Or perhaps along minor class or education level divisions.

However, within our case study, no obvious variations manifested. If I wanted to be particularly picky, I could say that women mentioned things around the benefits of permaculture attending to hunger and alleviating suffering for children/family slightly more often than did the men, but it is an N of less than 5, and the men often mentioned it, and when they did it was sometimes in more emphatic language. So I don't find this to be a meaningful variable at all.

As far as I could discern from this data set, there was no significant variability. This community had plenty of different themes and ways of understanding their complex world, but those differencials and richness were shared across identity spectrum.

It is of course entirely possible I am missing aspects of the complexity that are expressed along identity markers, or that this community simply shared more egalitarian and cultural reference points that have in fact reduced that kind of variability. When I specifically sought out such variability through some probing and even later on more leading questions, espiecally with some of the leadership to see if they would confirm or deny my observations, they were always confirmed – and usually before I had planted any kind of meaningful seed in what I had said, and usually this was shared before I did anything of that sort. It is in the data.
I think the more salient question, is would more pronounced variability show up in our other sites, and/or as we expand these studies to more divergent cultural spaces in other parts of Kenya and neighboring East African nations such as Uganda and Malawi? My intuition is that we would, given the cultural diversities that exist within many of those societies and more pronounced roles that gender, ethnicity, and religion often have in these spaces. Yet I also thought that would be true here, so perhaps that is simply my bringing a deficient model despite everything I have written about critiquing such a mindset, and I will in fact not din that to be the primary form of variability. I am, at the end of the day, unsure of what to expect within this data regarding variability. A disatisfying answer, but the only one I have at present.

**Improvement Science in Action in the Permaculture FFS Community: Continuous Evaluation**

There were several forms of continuous evaluation present in the permaculture FFS as manifested in this case study. One was at the managerial level, when Paul Omollo stepped in after the first workshop of this PAR and noted that some of the farmers were struggling with the photo-voice research and data collection. We checked in with the farmers about this, and it sounded like the quality of the data had to do mostly with familiarity with the phones, but also with photography itself and how to capture and tell the stories they wanted with a photograph as many of them had not had easy access to a digital camera like this before. As a result of this feedback, we created a third workshop run by Colin Richard who is a professional photographer, has worked in Kenya, and is experienced with photo-voice. This was led by both Colin and Paul and after execution of this workshop we again checked in with farmers to evaluate their level of comfort in engaging as citizen-scientists and they all felt much more at east and were enthusiastic to resume their data collection.
Beyond this, there was a plan put in place for continuous feedback from the farmers themselves into the implementation of the curriculum. This included a training that Paul and Regean ran on how to engage in participatory monitoring and evaluation. This empowered the farmers to engage in their own continuous evaluation of how effectively the curriculum was being implemented, and where there was pushback, why, how it could be improved, etc. This was a two-day training that was help before the implementation of the project. Farmers helped to co-develop indicators for the project and this data was collected and shared with everyone – an example of a NIC in action. It worked in that the quality of the data coming in improved markedly after just two weeks. Indicators of this are the number of farmers implementing with fidelity a number of different permaculture designs. This helped track how the intended curriculum and the attained curriculum tracked. (see Figure 3 below) This could be seen by both how many were self-reporting using the technologies, but also upon field visits, witnessing not just who was doing it, but how well. There was change over time, and the change was in part based on farmers self-evaluating how they were doing, and how much these changes impacted their yields, their capital, their ability to be more self-reliant, and the information related to this that they gained from others participating, which created more confidence in the implementation as they saw others who were doing well by implementing the curriculum as well.

<table>
<thead>
<tr>
<th>Summary (avg) of survey responses from 10 lead farmers</th>
<th>Base-line</th>
<th>Mid-term</th>
<th>End-term</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P</td>
<td>Q</td>
<td>P</td>
</tr>
<tr>
<td>1 Farmer has a minimum of 6 crops planted</td>
<td>0.2</td>
<td>0.1</td>
<td>0.6</td>
</tr>
<tr>
<td>2 Number of crops producing a yield</td>
<td>1</td>
<td>0.1</td>
<td>1</td>
</tr>
<tr>
<td>3 Farmer has effective seed storage facilities</td>
<td>0</td>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td>4 Farmer is storing his/her own seeds</td>
<td>0.3</td>
<td>0.1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>0.6</td>
<td>0.1</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>5</td>
<td>Farmer is planting legume crops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Farmer has a compost they are actively using</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Farmer has several different types of crops planted together</td>
<td>0.1</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Farmer is intercropping with pest repellent plants</td>
<td>0.1</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Farmer is using insect traps</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Farmer is using at least 4 different water saving strategies (mulching, harvesting rain water, wales, berms, half-moon berms)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>Farmer is re-using greywater to water crops</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>Farmer has a banana circle using greywater to grow crops</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Farmer has earthworks such as swales, berms</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Farmer is using dead or living mulch</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Farmer has multipurpose trees around the compound</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>Farmer uses energy saving items such as energy efficient stoves and thermal cookers (wonder bags)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>Farmer has shared their farm practices with minimum 3 neighbors</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td>Farmer has confidence in his or her farming practices</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>Farmer feels they have decision making ability over decisions relating to the farm and farm production</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>20</td>
<td>Farmer is finding their own solutions to their challenges on the farm</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
<td>Farmer is showing creativity and innovation</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 2: Continuous Feedback Loop from Farmers - Implementation of Permaculture Techniques

The 10 lead farmers’ data were collected using the data survey tool (see appendix ii). This was done on three occasions: baseline, mid-term & end-term.

We can see how this tool – and the 21 indicators listed in this tool – which were created with the farmers in a PAR workshop – helped the farmers themselves, along with the teachers of the FFS and the organizations involved such as permEzone and C-MRA to monitor how the intended curriculum was actually being implemented over time. This is an excellent example not only of continuous evaluation, but of continuous evaluation that incorporates data from local wisdom/knowledge, those actual best positioned to understand nuances of the system, and to be able to then "speak back" (Pascale, Sternin, and Sternin 2010) to the teachers, experts, and others trying to implement this curriculum and explain why something didn't work/wasn't implemented. Such gaps in knowledge can rapidly help improve a system and point to misunderstandings in a curriculum or gaps in knowledge about a cultural context that would otherwise have led to continued massive failure had it gone to scale without such iterative learning. We can see from the above findings that there are indicators that failed, such as item 21 – which scored at a 0, as well as items 7-10 and 13 which all scored very poorly. PermEzone, C-MRA and the farmers are in the process of unpacking what went wrong with these parts of the curriculum so that they can improve upon them (or strategically abandon them if there are reasons to do so).
A wave of new teachers: Knowledge transfer as a function of NICs

The most common manner in which knowledge transfer took root within a NIC framework was when villagers became so excited by what they saw happening that they became active recruiters to the content/pedagogy of this curriculum, and began teaching it to neighbors in the region. As their own farms modeled the content of the curriculum, neighbors often began inquiring about what was going on. Lucas Raute models what often then took place for those who wanted to become teachers themselves. "The three photos here are from when a friend of mine visited me. He saw how I was practicing my farming. I had planted some kale, onions, and banana. He became interested and asked me for farming advice."

Because this friend does not live near Lucas Raute, and Lucas Raute was excited and engaged enough to want to encourage this learning Lucas Raute "traveled out to him and his farm and advised him on how to prepare his farm, how to make swales to store water, and how to apply manure for nutrients. He did this and now he should harvest well." Lucas Raute likely always had that seed of teacher in him. And with that now nourished and watered, Lucas Raute was growing quickly. His friend is doing well, "and then prepared another farm" as he says "more and more" – this kind of change is creating collective change that is rippling out. As Lucas Raute notes, "**now we have plenty of food** and others are coming to learn from us." To be making statements about having plenty of food during such times…it doesn't need much elaboration.

Similarly, Emmanuel Wao points out that he had "one farmer who saw how I was practicing my farming" and this led to a conversation (co-creation of knowledge). Note how this again harks back to not only co-creation of knowledge, but why this creates more buy-in to such a curriculum, and thus to fidelity of implementation. "He came to get knowledge from
me” – helping ensure that the content of the curriculum would actually be implemented. "He saw that my farm was productive and good.” Emmanuel Wao points out that this other farmer now "has hope to venture out into vegetables" – vegetables are always more high risk for farmers because:

- they require more labor with weeding,
- are more at risk to drought and other climate change risk factors
- to not provide as much yield

This is a reason many of the farmers largely grow high carb, low nutrient crops, typically maize, which may offer calorie needs, but does not meet nutrient requirements. Many of which also have root systems that expose soil to erosion. (Some are genetically modified to not do this, or to include vitamins that make them more nutritious). Emmanuel Wao notes that many other neighbors are now practicing the various technologies needed to grow vegetables, with the people he has taught teaching others, the NIC having generated a training of trainers effectively, creating exactly the domino effect it was hoped for. "We encourage other farmers to practice these new practices we are learning."

Interestingly, such direct intervention by the farmers wasn't necessary for change to occur. Many farmers noted that "our training is changing the community" simply through the impact that their modeled behavior is having. The risk required for farmers on the margins to try something new is extreme. For a farmer who is struggling to have enough to eat, or enough to grow to sell to have enough money to buy extra food or to have money for school for their children, experimentation requires a high risk profile. But by seeing other farmers take this risk, and succeed, this creates an enormous amount of trust in that practice.

When I interviewed Paul Omollo and asked him, given exactly this, "How did you create trust Paul to get them to take such risks?" This is how he responded:
They were able to trust us – I’ll give you an example – they previously used to grow maize because it is a staple food. But when we came on board with permaculture we taught them that you can have alternatives and rotate crops. Because if you grow a drought resistant crop you can survive during drought and you can still sell and buy the staple food elsewhere. If in Asumbi there is a drought but in another region they have rain, if you go for drought resistant harvest you can still harvest, sell the surplus, and buy some maize from somewhere else. So they trusted us with this logic. And buy sharing about how permaculture can increase nutrition and soil they trusted us.

I think it's because we speak the same language, we are from more or less the same locality and we were able to tell them that this is something that we have actually been doing and it has worked in other regions and we could give them examples. The examples included both stories and pictures, I used to work for PRI-Kenya and a project we did in Rongo for coffee was funded and we were able to explain to them in stories and show them pictures. Coffee, people don’t eat it, but the farmers there who grew it raised a lot of money and could then purchase the staple foods. So it was easier for them to accept what we were saying, and Rongo is nearby so they could easily identify with the successes we achieved in Rongo. (Paul Omollo, Personal Interview January 12 2022)

If a group of other research-practitioner farmers – engaged in a NIC, take that risk, support one another, and succeed, then there is built in trust that something they are doing must be working. And indeed, this is what we witness, and the ripple begins, as mimicry was witnessed and many other farmers in the neighboring region simply began trying to mimic what they witnessed, as the risk was now diminished.” Put another way, Asumbi Village is the positive deviant effectively for this region about how to maintain food security, avoid mass erosion, regenerate an ecosystem, and avoid a catastrophe for farmers during a drought. For example, Jerry Wao observes "there are now pumpkins in the neighbors garden [this was a new crop introduced by permaculture]. They are growing quite well. They have copied this from our training and our farms." Jerry Wao is happy to observe this noting all the reasons that pumpkins provide utility to the soil, resilience to climate change, and health, and then says "this is why most of the people [in the area] have decided to follow us."

Jerry Wao further points out that some nuts and peas, and other nitrogen fixing crops "have also been copied from our training and our farms.” This is good because "it provides
vitamins and is a cover crop so it means our training is changing our community." What I wonder about here, is if some of this other information is being communicated in conversations between the original farmers who received the training and those in the region who are mimicking the practices. For the nutrient component, or some of the underlying logic of why certain technologies work or offer benefit to Gaia, regenerate ecosystems and soil, may not be readily apparent. Philosophical underpinnings to the curriculum more rooted in ecopsychology such as interbeing are less likely to be obvious to someone simply mimicking a technology. What are the long term impacts of such a form of knowledge transfer? This is very unclear.

Monica notes just how much co-creation of knowledge has occurred, "we have gathered a lot of knowledge." Moreover, importantly, Monica notes that this information is in a place of happiness. That it is creating a learning culture that is warm and as a result "my neighbors loved it and therefore planted cabbage and used proper mulching. We are thankful." The idea of gratitude was common, especially among women, but many farmers expressed it, iterations of "we are thankful" and expressions of gratitude to the trainers and other participants for what they have learned and accomplished was common, they understood how much change had been made possible by the new content and framing of ideas brought to them. That there was now a potential to work together in a different way to effect mass change. As Monica notes, not only has she influenced her neighbors, but those neighbors are doing the same thing "and also other neighbors have learned from them."

Hermann also notes how after these trainings "my neighbor has copied what I have been doing in my farm. He is now harvesting these fruits." Hermann was also proud of this, and took pictures of his neighbor, whom he shows off with a smile demonstrating his neighbor growing watermelons for the first time.
Of course, farmers also point to examples where people are coming together to learn and work. Phillip notes how "the neighbors are happy" about the upcoming harvest "and are joining in our efforts at cultivating this food crop" – and then points to a photo where they are all working together to learn how to grow this new set of foods, especially pumpkins. Valentine likewise notes how "I have assisted my neighbor" who had "seen all the work I do" on his own farm. As a result of this relationship his neighbor was able to learn "to take care of his cassava and kale crops that [we have worked on] together and he is happy with what we are doing." The picture shows both of them working together on each other's farms.

Rooting this change in joy, and perhaps for the purpose of how I'm choosing to present these data in my dissertation, what I am selecting and highlighting, this is significant. It speaks to the "desire based framework" and space of love and joy that Tuck and Love (Tuck 2009; Love 2019) emphasize is so essential for unrooting systems of oppression and facilitating those new imaginaries that critical theory speaks of. If we want new kinds of systems that are rooted in beauty, love, kindness, inter-being, biophilia – literally a love of life, then we must also facilitate listening and emphasizing the stories that attest to every day humans' capacities to not only be resilient, to not only survive, but to thrive and engage in such co-creating these new spaces. They are the change. But we have to listen.

All of these forms of transferring knowledge point to many of the indicators listed at the beginning of this section regarding how it would be expected to function within the context of a NIC, building trust, vulnerability, using iterative design, facilitating risk taking, and raising all voices. There are short comings as well, and places where it is falling short.

In the next subsection I will address spaces where the attained curriculum of this ecopedagogical curriculum has fallen short, and subsequent to that I will offer some policy recommendations for how to improve it before concluding this dissertation.
Conclusion on FFS Ecopedagogy Curriculum Success'

The sections above focused on where FFS ecopedagogy curriculum are having the most success in moving from an intended to an attained curriculum. This included exploring components of their impact on biophilia, interbeing, regenerative agricultural technologies & development, as well as systems thinking & NICs. In the subsequent sections I will explore where the FFS ecopedagogy curriculum most failed, where it could most improve as an educational policy, and what recommendations I have based on this dissertation for it regarding educational leadership and educational policy.

Where FFS Ecopedagogy Curriculum is Most Failing

The ecopsychology around interbeing and biophilia is weak

While in the above sections I focused on ways in which the attained curriculum pointed to manners in which the curriculum did manifest aspects of an awareness for interbeing and biophilia, which are true, paradoxically, I would argue that on the whole, this are of the curriculum is very weak.

Farmers did not on the whole speak directly about interconnectedness, though the manners in which they spoke about living systems and the importance of diversity for resilient systems was significant and impactful. The degree to which they spoke about the need for interconnected systems to have a living ecosystem that can support life was meaningful. However, their ability to meaningfully comment on the value of other than human life was not present, nor was their conversation about soil as a living organism for
example (as opposed to say dirt), or the value of other life forms. This is, considering the epistemologies (plural!) present within permaculture and ecopedagogy, disappointing. It speaks to an absence both of interbeing and biophilia that should be addressed.

Critical literacy around historical context is absent

*Men and women are human beings because they are historically constituted as beings of praxis, and in the process they have become capable of transforming the world – of giving it meaning (Freire, 1985, p. 155)*

There are many components of critical literacy that are highly present in this curriculum, as was noted extensively in the subsections above. I do not want to slip into a deficit model (Tuck 2009), and given how difficult it is to attain such forms of critical literacy, the degree to which such gains were made should be the highlight of these findings.

As noted earlier in this dissertation:

Although environmental devastation is a key effect and cause of social conflict, this fact is often systematically hidden and thus ignored by most of the population or political[ly] hidden curriculums to systematically sustain and increase hegemony (Misiaszek 2010 p. 471).

It isn't shocking that this is one of the shortcomings, this is one of the most hidden components of any curriculum. This is a space for improvement for this FFS, and that is alright. While most of the farmers were able to offer meaningful critiques of why synthetic fertilizers are not a net positive for their living systems, could explain how erosion works over time, why diversity of crops matter, how commodification of systems works to abuse them, and so forth, they did not engage in dialogue about wider historical conversations around development that have created these paradigms (Ford 2016; Bauer 2012; Conrad
2010; Shiva 2004). Who benefits, who does not, and why (Greg William Misiaszek, 2020). For example, why is it that most of the local crops that used to be planted, which are naturally drought resistant, and help to rebuild these soils, were eradicated? Who benefited from this? Who didn’t? Why is it that lands were divided the way they were? Who benefited? Who didn’t? Why are synthetics pushed by big international agricultural companies? Why is seed collection not encouraged? Why has monoculture been pushed as a form of cash cropping for agricultural development? (Bauer 2012) A root cause analysis was not done at the level of the farmers, and this is a critical mistake and should be addressed.

**Strengthen the co-creation of a theory of change/problem:**

A theory of change is practically nonexistent in the approach. There is a detailed theory of change from the organization permEzone (Hugh Kelly 2019) and has been presented by their founder Hugh Kelly. Paul Omollo has spoken about a theory of change as well during meetings with permEzone. However, when the larger group convened, and when the curriculum was presented a theory of change was not always as manifest. A theory of the problem was also less clearly articulated in advance of an implemented solution. This led to some confusion among farmers about how the curriculum was to be thought of, and may account for the findings in the table demonstrating which aspects of the curriculum were implemented over time and why (to verify if this is the case further follow up interviews would be needed).

So for example, as an alternative theory of development as part of the theory of change being implemented from above, there was an obvious focus on self-reliance, and local solutions. This aspect was picked up on. And the farmers did an excellent job embracing this and utilizing it where these components of interventions existed and are more clearly obvious. However, it was not always possible, at least in their own eyes to the degree they
had achieved their own cooperative and managed to utilize regenerative agricultural techniques to increase their surplus to raise cash, to provide for their own needs. There was also a complete failure to implement certain components of the curriculum that would have led to significant increase in resilience such as the building of earth works (item 13 in Table 2) which would have significantly improved water retention and the ability to thrive during drought and increase yield and harvest. A reason for this may be the upfront cost of labor, the difficulty in understanding a much more distal imaginary of the return on an investment, or the lack of an actual model to mimic to be able to have experiential learning and reference points. Whatever the reason, there wasn't an ability to learn from failure here, or to engage in a lot of continuous evaluation based on the feedback at this point, and part of the reason for that is likely that the farmers themselves weren't clear on the connection between the theory of the problem, the theory of change, and the reason for the indicators in Table 2 around some of the intended curricular goals. To fully interrogate some of the claims I am making here, we would need more in depth follow up interviews, which we are intending to engage in over the coming months to further fill out this data set and understand better aspects of the curricular short comings in greater nuance, and iteratively improve upon ways to engage in this PAR design, and how to create better models of a theory of problem and change with the farmers.

The critique I am offering here may also explain the outlier theme in which one farmer deviated from the permaculture form of slow local non capital development, and instead called for a more "classical" capital based development to expedite their ability to transition over to this other ecopedagogical model. For example, Valentine who is among the most ambitious of the farmers with his permaculture projects, has created a food forest and also gone into chicken farming. While he has what he calls "a very good farm" and has expanded it in ways that created food security not only for him and his family but neighbors,
"I am happy with it, and if one could have a farm like this and work on it like I do, they would have a high return on it for food" – he has grown a little impatient with the rate at which they can increase the scale this way, as he sees a pathway to security for all of them if they could have more investment. For this reason, he wants to find capital investment to expand it more rapidly for development, and he has been unable to secure that capital, which has created a level of frustration where his vision can't be met. Even if capital investment isn't the way to go, what is required is a theory of the problem and a theory of change, which would alleviate, either way, this frustration, as there would be a shared understanding of the path forward. This exists, and there is a reason for going slow in the way that Paul is counseling, but it seems there is a disconnect with the vision between the curriculum/permaculture/ecopedagogical model Paul/C-MRA/permEzone are offering and what Valentine has in his mind. Is this a function of something existential? Or is it a function of a lack of communication around the theory of the problem and change? That is a fundamentally important question to ask. And in all likelihood, while Valentine is the only one who voiced this tension, others are holding it.

Similar frustrations have been shared by farmers around chicken farming, which is a particularly expensive venture. Without extensive knowledge and training around veterinary medicine, the farmers will need to have some cash available to pay for medicines, veterinary care, and other supplies to help keep their chickens healthy. Absent this, they end up having to kill some of their birds unnecessarily, which creates a psychic pain for them, that they have articulated, and goes explicitly against the kind of biophilia this curriculum is trying to cultivate. Some of the concerns raised by Valentine however speak to a failure of the curriculum itself. He noted that he needs more space for the chickens in an enclosed structure that he needs money for to avoid them getting stomped on. "I do not have enough money to buy medicine for them. I also have young chickens that need to be separated so the bigger
hens don't step on them. I need another house for them and I need someone to assist me with that so I can scale this farm up." This isn't really true, in fact, a better permaculture design would be an open design in which the chickens can roam free, and their excrement would be spread out over the land as a natural fertilizer. This is a common permaculture design for chickens. There is no reason to be enclosing them as much as he is, as can be seen from his pictures. There seems to be a curricular failure here in how the farmers are being taught to raise chickens per permaculture ethics and knowledge systems. So there are two knowledge pieces here that seem to be falling short.

**Suggested Improvements to an Ecopedagogy Curriculum for FFS in Kenya**

There are a number of ways in which we can learn from the myriad successes of this implemented ecopedagogical curriculum, it's attainment, and it's shortcoming, to offer educational policy recommendations, as well as some secondary correlates that relate to leadership. I will enumerate these below and then address each one in a separate subsection. As has been done throughout this dissertation there will be some interweaving between these threads, given the strong overlap of ideas present.

1. Convene the farmers at the beginning and co-create a theory of the problem
2. Share this theory of the problem, make it public and iterative, and use it to drive the shared theory of change, beginning with the one created organizationally (permEzone and C-MRA)
3. Have more input into the curriculum from the farmers – which topics do they want to focus on and why? Which less and why? Use more continuous inputs
4. **Focus more on adaptive leadership** – we now know the farmers will become teachers/trainers and disseminators of knowledge. Let's skill them up more as future leaders.

5. **Strengthen curriculum around eco-psychology** for purpose of biophilia and interbeing components within ecopedagogy.

6. Create a continuous evaluation feedback loop – so they can become their own evaluators to have an improvement model that can be easily shared at scale.

**Strengthen the Co-creation of the Theory of the Problem**

If we return to the idea of a NIC and IS – recall from Chapter Two Section Six that one major component of this should be a shared problem of practice. Also from Chapter Two Section Two is that "biophilia and inter-being are at the heart of a problem of practice for ecopedagogy." Given this it is important that these components of the curriculum be backwards mapped more into the theory of the problem. There is an important iterative loop here that isn't being addressed. See the section below on strengthening this component of the curriculum.

More generally co-creation of a theory of the problem creates more buy in from participants. It also ensures that all voices are present at the convening. Diversity of voices increases perspectives and helps ensure that a problem is being correctly understood. It avoids group-think, which is easy to slip into, where a limited perspective from fewer people, or a large number of people but from similar perspectives, can cause a problem to be incorrectly understood. When this occurs a "one best system" design is often created, and it typically will fail (Wujec 2010). Diversity of ideas creates a stronger understanding of a system, a stronger buy in, more fidelity and resilience, and a better systems design. In the model here, the theory of the problem was largely created by outside observers, with little
input from the front line workers (the farmers) who have the best understanding of the system being evaluated. This is a simple mistake to correct. As an example, the trainers for the curriculum are teaching, in a banking model of education, that the problem is erosion, or various treatments of soil. This is indeed true. But these conclusions could also be arrived at via observations and dialogue with the farmers. They could be arrived at via root cause analysis with the farmers around food insecurity and what is driving this. And that would not only create a more robust theory of the problem, it would also inevitably reveal a more historically critical underpinning to what is going on and why, as well as hidden components of this problem that are driving practices compounding the problem of erosion that outside observers are likely staring at and missing. I may be a someone with farming experience from New York and Israel, but what is driving erosion in those geographies, although it has similarities, still has subtle and important socio-historical differences, from what is driving it in a rural part of Western Kenya.

An approach to co-creating a theory of the problem in this way, would also model for many other FFS, adult literacy programs, permaculture schools, and other educational spaces the power and possibility of engaging in such praxis. It would more radically model that even those with minimal literacy have enormous amounts of wisdom to offer not only in intervening in a problem with solutions, but in conceptualizing the problem with complexity. This is important in shifting from dEmily Osloge based research to desire, as Eve Tuck discusses at length in her essay (Tuck 2009).

Such a co-created theory of the problem will help drive a more appropriate theory of change, which I will discuss next.

Use the ToB to drive the Theory of Change
By having such a co-created theory of the problem, and displaying it publicly several components are achieved.

- public buy in
- an opportunity for continuous and iterative feedback, both for additional ideas, and critical feedback
- it can be used to drive a theory of change

The last point is what I will focus on here – the ability to use this theory of the problem to drive a theory of change.

A theory of change was discussed in Chapter Two Section Six. The basic ideas is it is a logical sequence of events to hypothesize that step a will result in consequence b upon system c based on a root analysis of the system. That root analysis is the theory of the problem, and an understanding of how to disrupt it (the theory of change that emerges from the theory of the problem). PermEzone and C-MRA have a theory of change, which I have discussed elsewhere in this dissertation. The problem is that this theory of change is not transparently shared with the villagers. If I were to ask each villager for a theory of the problem and change for how to create a more regenerative farming system, or how change is created, or various other questions along these lines (which I have done) – I get different answers. There is not a shared vision of the problem or solutions. This is because the theories of problem and change were not co-created and shared publicly. This diversity of ideas is a good thing! It offers multiple perspectives and data. But it is only a good thing when it is shared with iterative knowledge so that everyone can benefit from potential ideas and then test them iteratively. Otherwise it will simply create confusion, with no real ability to track metrics and understand what is causing change, when, or why.
Furthermore, absent an iterative design in which front line workers are having input into the theory of change is lacking by design. It lacks a fundamental piece of data in those who need to have input for a complete theory. The ones who are closest to the problem cannot be absent in voice from helping to create an understanding of the phenomena.

This is again a reasonably simple component of this system to correct. Just as suggested above for how to co-create the theory of the problem, so too here, a theory of change should be similarly co-created after the theory of the problem. If external experts have already created something, this could either be used as a base upon with they can build, or they could build their own first and then be offered the one from the external observers, and consider what to combine, reject, add to, subtract from, and so forth, and then each group could engage in dialogue about the design. But a conversation between the two groups has to occur for a more robust understanding of what is taking place, and to ensure more fidelity of implementation.

Democratize the curriculum

This is a rather simple policy recommendation. Similar to the above in regards to buy in – and given the enormous amount of content within an ecopedagogical curriculum, it would be simple to democratize this curriculum a bit by giving farmers some choice over what they learn. A buffet of topics could be offered, and farmers could decide on their favorite 3 out of 7 for instance. Create some choice. This very simple act of empowerment and voice would likely lead to more engagement from the learners (G. Misiaszek 2012).

Add Adaptive Leadership Training
One of the major findings from this dissertation is that farmers exposed to this curriculum become trainers and teachers. They learn to become change agents, and that their neighbors are influenced by them and come to them for knowledge and skill building. There is significant and meaningful opportunity in this. While it has already had meaningful gains, such as the rippling out effect onto neighbors and their ability to adapt many of the techniques of permaculture, there is more that could be done.

Now that we know that this curriculum may have such impacts, there can be a design to more intentionally set up the adult learners for success as future teachers and influencers and test this out. Recalling from Chapter Two Section Six on adaptive leadership, the myriad ways in which this theory and practice of leadership fits in to both systems theory, NICs, and components of improvement science, it would reason that adopting adaptive leadership as an educational leadership theory and practice for training as a component of ecopedagogy should be a significant way to improve this curriculum and its ability to setup those learning in NFE FFS the ability to go and facilitate collective impact.

From the literature review recall that adaptive leadership was defined in part as and ability "to help leaders consider how to move away from command and control thinking that attempts to approach problems and problem-solving in a linear manner (taming of a wicked problem), with six guiding principles

1. "Getting on the balcony
2. Identifying the adaptive challenge [often a wicked problem]
3. Regulating distress
4. Maintaining disciplined attention
5. Giving the work back to the people [participatory approaches and methodologies!]

272
6. Protecting the voices from below [again, participatory approaches!]” (dissertation p. 20)

Most of the fibers and threads for adaptive leadership are already present, as has been presented in both chapters 4 and 5. What I am recommending is that this form of leadership training be made more intentional and not an intuitive one that relies on a current cultural space that could easily shift based on a specific singular personality in a teacher or set of students. For example, absent Paul Omollo, the cultural space of this curricular implementation would likely be radically different. That is too insecure a design. But Paul could certainly help create an adaptive leadership training component that would help secure the delivery of this curriculum with a wider set of competent and culturally aligned pedagogues.

This more than any other recommendation is in a systems thinking frame what I believe would have the most leverage for creating change and should be tested out.

Strengthen Eco-psychology component of curriculum

Strengthen the curriculum around biophilia and interbeing – and ensure that as the curriculum trickles out it doesn't become technical literacy, which is what it becomes in the second ripple right now, that won't sustain itself. There will be no underlying logic to it. This is a major danger right now.

Recall from the literature review that:

if we are to understand how we are consuming the planet to death, we must seize the opportunity to critique present day techno-poly (the worship of technology) [emphasis
added]" (Fassbinder, 2010, p. 464). We marvel at our own “progress” as a civilization, by ignoring the devastation this progress was, and for hundreds of millions of people today - continues, to be built on (Quinn, 1995). Dissertation page 58

If the permaculture FFS turns from an intended curriculum rooted more in eco-literacy to one that becomes technical literacy it will fail for all the reasons mentioned in this quote above. I see this as perhaps the greatest current threat to the current iteration of this curriculum as an educational policy that can be (positively) disruptive in creating change.

Eco-psychology which has become a topic of increasing research and practice, and incorporates the components of both interbeing and biophilia – two critical aspects of ecopedagogy. I want to reiterate that I do not want to slip into a deficit model. Significant components of both biophilia and interbeing have been interpreted as being present in the attained curriculum as noted earlier in this chapter.

In the original subquestion about biophilia in Chapter Two – it was stated that there could be a wide variety of expressions of this domain of the curriculum "but at its heart there should be just that – heart. Something passion should be coming through in the curriculum that is pushing beyond the rational to encourage participants to consider what their emotive spaces, inter-relational spaces, spiritual spaces, and so forth are as well when considering their relationships to life. This could be, using examples I have seen from real curriculum, creative writing exercises about the story of a tree, a blade of grass, imagining the consciousness of other-than human minds and what alternative ways of thinking such minds may have (for instance, what is it like to smell time – something that dogs can do). Etc. There are ample examples from science curriculum for how such biophilia has been captured and I will be on the lookout for any of them, as well as new, creative, emergent and hopefully

57 Though neither Kahn nor Fassbinder point to Fromm, here again we hear the echoes of the idea of a necrophilic civilization, and whose counterpoint would be one based, as Fromm stated, on love.
unexpected manifestations.” In this regard I would say this FFS curriculum has fallen short. Have there been expressions of heart by the farmers regarding their love of land and one another? Without question. And – have they expressed this kind of love as explicitly towards Gaia, towards an idea of ecosystem and interconnected life, or towards something more spiritual as a love of life? Much less so.

These components of the curriculum are weaker than they could be. They had to be interpreted via a shadow of their expression. Direct language wasn't used. Love of land is manifest – in tone of voice, in expressions of faces showing off their space, in some of the ways they speak of their spaces "this is my mango tree!" There are articulations of interconnectedness between living things and ecosystems. However, there is much more that could be teased out around these two topics. The sections in Chapter Two around the curricular content of these topics are large, and are simply condensed bullets of entire books and practices around these ideas. By and large, the NFE FFS curriculum, even when being implemented via a permaculture design, is still weak around these topics. It shows up significantly more than it would without a permaculture lens, which is what makes it (in part) a manifestation of ecopedagogy, and this is because by virtue of being a permaculture lens, as Bill Mollison notes, it is rooted in caring about Earth, in thinking through aspects of "what does this land have to offer" in considering how ecosystems function and tending to Earth instead of taking from her. It is naturally attuned more to Gaia qua Gaia.

For this exact reason, it is paradoxically very strong at answering another component of the biophilia question around valuing diversity of life whose indicators were around care for soil, cultivating more diverse insects, increased knowledge in ecosystems, and biomimicry etc. There are mixed results for this section of the curriculum.
The same is true for inter-being – where some indicators predicted such as interdependence across ecosystems were loud (see above section on interbeing) and others such as more emotive expressions were nearly absent.

And as a curriculum it could be developed to offer more as a spiritual system around these ideas. It would benefit in doing so. A major reason for this can be seen in how this curriculum is already rippling out when the first round of lead farmers exposed to this curriculum begin to influence the second layer of farmers. When I explore how collective action functions in the community above, and how the farmers view and understand change in their communities, there is a lot of positives to explore. Neighbors seek them out. They mimic them. They seek them out for advice and want to understand what is going on and why. However it is also important to note that most typically what is being mimicked, and what is being learned directly when the farmers who learned this curriculum engage as teachers, are the technical components of the permaculture curriculum. What seems to be absent, are often the root causes underlying it. The more spiritual components, the underlying reasons for approaching these technologies this way. It loses the critical literacy component, it falls back into banking education, and risks losing its ability to create collective impact at scale. This has obvious overlap with a co-created theory of problem, theory of change/action, and adaptive leadership training, all of which would help address this as part of the educational policy/educational leadership around an ecopedagogy curriculum.

Create Continuous Evaluation Feedback Loop
As noted in Chapter Two Section Six, a continuous evaluation is a key part of improvement science and fits in with NICS and systems theory. A continuous evaluation differs from a classical evaluation which would only take a snapshot evaluation at the end of a treatment and then offer feedback based therein. Instead a continuous evaluation model would take, as the name implies, continuous evaluative data, and feed it back into the system. This could include qualitative data, such as photo-voice, that participants could use to evaluate their theory of the problem (to what degree did they correctly understand the problem? What may have been missed or not emphasized enough or too little?) and how accurate is their theory of change/action, what needs to be modified and why? Such a continuous evaluative model fits into many of the threads discussed elsewhere, from systems theory to NICS to forms of adaptive leadership. It allows for iterative design and empowerment of diverse voices to understand complex systems. This would drastically improve the speed at which a complex system such as this could be understood and improved upon (White, Blatz, and Joseph 2019; A. S. Bryk 2015; D. H. Meadows 2008; Pascale, Sternin, and Sternin 2010).

Below I will go into some further detail about the relationship between continuous evaluation and improvement science and why this would be a drastic improvement to the educational policy embedded in an ecopedagogy curriculum for NFE FFS utilizing such a curriculum. I will then conclude this dissertation.

Utilize Continuous Evaluation & Improvement Science for Curricular Design

There is an explicit link between this case study, continuous evaluation and improvement science. Vogt et al. note that, “project planning and implementation proceed most effectively when evaluation is considered from the beginning and not left to the end and
treated as an add-on or a compliance gesture” (Vogt et al., p. 316). By having a specific logic model, an explicit theory of change linked to specific outcomes via clearly articulated processes, it is possible to evaluate and test out both the processes and the outcomes, and to engage in a continuous evaluation feedback loop. “Ongoing evaluation is a necessary component of successful projects” (Ibid.) for the same reason that improvement science views the feedback loop as necessary for improvement. Without this continuous evaluation, there is no feedback from the data. Is the logic model correct? Is change occurring? And if so, for whom, under what condition, where, and why? The only way to improve is to use some kind of feedback mechanism like this, and it should be a continuous feedback loop so that, just as I say in Chapter Two Section Six, there are constant iterations and improvements.

This connection to improvement science is made rather explicit. Vogt et al. note as a guiding question and principal for such comparative case study work that the researchers should consider if “the project's orientation to evaluation improvement or compliance? Is it using evaluation results for improvement or merely collecting data to comply with federal and state reporting requirements?” A case study, including one utilizing photo-voice designed for many adult learners in farmer field schools lacking basic literacy skills, is perfectly aligned with the needs of a continuous evaluation model that can address the needs of learning how to embrace local wisdom, to improve, and to share knowledge and innovate – thus building resilience. As has been noted elsewhere in this chapter, there are significant gains that are being made along this curricular impact, with attained curriculum. Noting when and to what degree this is happening, for whom, under what conditions, would have major benefit for the teachers and learners. What aspects of the curriculum are causing this? Did everyone learn that at the same points? Was it based more in practice or a theoretical? Such knowledge would allow for more rapid iterative improvement.
Some of the other guiding questions that can be asked in a similar guiding vein relate to the theory of change. Namely, “Is the project evaluation linked to a realistic theory of change that can be used to assess when progress is being made? Are realistic causal mechanisms, based on a review of the research literature, part of the theory of change?” (Ibid.) Other key aspects that weave continuous evaluation with improvement science are about paying attention to explicit partnership roles and definitions (which relates back to logic models) as well as operational definitions for outcomes (which again relates back to logic models). A key component of being able to have such operational definitions for outcomes, which is deeply related to improvement science and the attitudes it has to be paying close attention to variability, is the need to have a baseline or the ability to have a comparison group for outcomes. Otherwise it is impossible to know if the intervention is having an effect, or the degree of effect. Our team in Asumbi developed baseline surveys to establish baseline data pre-curricular treatment for this reason. The farmers are already now thinking of themselves as researchers. This is excellent. As noted there is a limited continuous feedback loop which led to them improving upon their implementation of permaculture techniques and sharing knowledge internally. The next steps would be to include more adaptive leadership training and to build into this components of thinking of selves as leaders and researchers how to take their own data, and begin using it to continuously evaluate what is occurring and how to share that back to the group in order to evaluate their systems design and curriculum and then make collectively agreed upon changes to the vision.

Generalizability of the Study

As was noted at length in chapter 4, there is a great advantaged to a comparative case study, as when done in the right manner it can significantly add to the generalizability of a study. As this
is a singular case study, any generalizability would be unwise. It needs to be taken as a deep dive into a particular context, a set of stories that are meaningful and valuable, and provide illumination into a complex system and offer a text case. Within the systems view of "what is working for whom, under what conditions, and why" it begins to answer this question. But to understand variation in the system, we need to find out some of these answers in some other contexts with some other people. We can then begin to get much more clear view of the system and understand wider implications for educational policy and leadership. Even so, I have outlined what I believe are the preliminary implications based on this singular case study that are worth testing out in subsequent (small scale) rapid iterations in order to understand the system better before any larger scale implementation would ever be tested.

Recalling from the earlier chapter for a comparative case study to offer such generalizability a key component be that it "share important common attributes (Caramani 2009)" which in many ways actually would go against the variation of a systems approach for IS. In either event, both scenarios are going to be explored by C-MRA and permEzone in subsequent studies, so generalizability should be increased with some rigor in the near future for policy implications.

I will now offer a conclusion to this project and dissertation.

Future Research Directions – Where to?

PermEzone and C-MRA already have four other sites like Asumbi carrying out the permaculture infused NFE FFS curricula. All of these sites trainings are coming to a close, and are engaging in data capture. This means we will have the capacity to begin significant comparative case studies in the near future, extending our ability to generalize the findings. It also means, importantly, that we are likely to begin seeing more variability in the disaggregated data. Perhaps this will mean that gendered differences in the data emerge, or those based on age, or something totally unexpected. Perhaps it will be around a very
different ecosystem, ones where water is more abundant, or ones were resources are more scarce. We don't know. Perhaps the curriculum will continue to have largely positive results with minimal variability in outcome/impacts among participants (though this would be very surprising if true). We can learn more if we begin to see some variability within the system, what is working for whom, under what conditions, and why.

Relatedly – the nature of participation will likely look different in different communities. If we see some variability in different communities, say along gender/age/class, we may see differentials around willingness or ability to participate. Additionally, we know that we want to have a more active role among participants in the interpretive role of data in future projects – hopefully with how this project worked laying some of the groundwork/template for that. Several executive summaries already written by farmers will also help serve as such a template.

Ecopedagogical Innovations

We have also begun to build bridges with other organizations, including those who work with Masaai in the South of Kenya, as well as with villages we are running this curriculum with in Uganda. The Ugandan village will allow for a international comparative case study, and the work more geographically distant in parts of Kenya would mean working in very different ecologies and cultures.

This future work is itself being partially directed by the farmers who have thus far been a part of the studies. The decisions about where to go from here, and how, are also being done in participatory manners. We are implementing democratic norms, bottom up approaches, and this means genuinely empowering voices at the decision making table. This includes decisions about future research.
There are plans for some of the leaders from Kenya, California, and New York who have helped to create these organizations and spearhead some of this work to convene in the summer of 2022 in Chicago, IL to begin discussing the formation of a new group called Farmers Alliance for Restoration (FAR). The purpose of this group would be to create a larger umbrella group for all permaculture organizations in Uganda, Kenya, and Malawi that wish to work together to create a NIC around FFS dedicated to NFE work with ecopedagogies. This would allow for knowledge sharing to spread more widely. For farmers to be able to share their knowledge peer-to-peer across similar cultures, language systems, and ecologies. It would be a system of trainers, teachers, and policy leaders who can engage in Southern – Southern development advancement.

Ecopedagogy is a relatively new educational innovation. It is rooted in critical theory, and was Paulo Friere's next intended book, which he was writing but died before he was able to publish. Ecopedagogy is itself an educationally innovative idea, as is global citizenship education, though both have already been around for some years at this. That being said, more detailed ideas bout what curriculum for them should like, that are not only theoretically fleshed out – as this dissertation is, but also offer specific examples of a curriculum, and ways to measure, begin considering impacts and how to iteratively improve upon it, is much more pedagogically innovative. That's what this dissertation has begun the work of doing – in collaboration with all the people and organizations behind it. There may not be any one single pedagogical innovation per se, it is the way in which the ideas are woven together and applied that is innovative. Above all else, it is the notion that pedagogy needs to be more rooted to democratic processes, community infused voice, meaningful learning that attends to Gaia, and collective action. We are at a point in human history where pedagogies that don't attend to biophilia should be rejected wholeheartedly. To my mind, that should't be particularly innovative, but sadly, it probably still it. I read just in my news feed today of
friends being arrested as they were pulled down of 100 year old cherry trees they tried to protect from being cut down in a public park in Manhattan. As many of them noted – what is the nature of the education and social systems that those enforcing such mandates and laws – think it both ethical and moral to engage in such (death loving) behaviors? What is the nature of the economic system we have created where they feel obliged to do this in order to "survive" or provide for their families? Ecopedagogical innovations lie in creating a new paradigm that can help build a different system for both how to think, and therefore, how to behave – praxis. One rooted in a love of life. The curriculum explored in this dissertation is but one example of ways that could manifest.

We have already had colleagues from Western Africa reach out to us, who live on similar lattitudes and are interested in collaborations for these reasons. By creating a meta organization whose main job is to coordinate the knowledge sharing, and help ensure that we are learning from both successes and failures, and implementing from the continuous evaluations occurring within each organization/site to continuously make iterative improvements to trainings, workshops, and curricula, we believe we can exemplify what an improvement science based set of ecopedagogies for East Africa can manifest as.

Conclusion

This dissertation is the culmination of an eight-year journey. It has taken me to different parts of the world and different cultures. It has created many dozens if not hundreds of relationships and impacted hundreds of lives. It has impacted my own quite profoundly. Whenever I teach a classroom I find that I learn more from my students than they learn from me. I've taught for over 20 years in every grade from Kindergarten through graduate school. This was one of my first times working with adults in a NFE setting, and my first time within an FFS setting. It was no different in teaching me more than I had to offer as a teacher. In the
Sayings of the Fathers, a book of proverbs in the Jewish Cannon, there is a quote "who is the wise person, the one who learns from everyone." Indeed – there is such wisdom embedded in the stories of humanity. By having taken a participatory action research design, I have had the opportunity to be gifted the stories, via photo-voice, and just listening and talking with other humans, countless stories about their ways of living, of being, and a piece of how they understand the world. This has both affirmed, challenged, and changed my ideas about how eco-consciousness functions, and how collective change can’t work, and how to improve these educational policy ideas and curricular innovations.

Ecopedagogy is an idea that speaks to my heart and soul. Earth is suffering right now. Gaia is suffering. Mass extinction is an event that we need to take much more seriously. Our descendants will not easily forgive us for this sin. We have inherited a paradise, full of wonder, full of life, and we are squandering it. We must elevate our collective consciousness and save the life we are surrounded with. It is a blessing that has been given to us, and it is ours to cherish. We are a part of this world. I believe that ecopedagogy is an educational policy that, as an extension of critical literacy, offers one possible path forward for helping to listen, learn, and teach one another how to be kinder and more loving to beings and life on this planet, both the human-animal, and all the others.

During the research conducted in this dissertation I think I have demonstrated that ecopedagogy does indeed largely achieve these goals. The farmers have shared extraordinary stories. They have risen to a remarkable challenge. With minimal exposure to this curriculum and trainings they have fundamentally changed their farming practices. An extremely risky thing to do for those facing potential starvation with a failed crop. They have reintroduced local crops, as well as foreign drought resistant ones. They have reclaimed resilience and pride. They have demonstrated a new found love for their land as it becomes healthier and full of diverse life. They laugh and smile as they show off what they know with friends and
neighbors and share in the bounty of the land. They grow soil. They speak of a desire to work hard and share in the ability to continue down this road to prevent pain and suffering. So that children to not go to bed hungry, so that the land can heal and not wash its soil away and be sprayed with poison. Are there shortcomings to how this curriculum was implemented? Of course. Is there room for improvement? Always. **And** has this program and educational policy and curriculum demonstrated a capacity to influence rural farmers to become leaders of their communities and create collective change and facilitate eco-consciousness? Without question.

I have written at length about the participatory nature of this dissertation, and about epistemologies and ontologies. About voice and respecting stories. Many of the boundary crossing academic authors of such work note that a significant contribution of those who engage in PAR and present such findings is the PAR itself – to bring in voices into academia that are typically left out, and to demonstrate the wisdom such stories have, and demonstrate why ignoring them when considering policy is unwise. If we go back to the definition of a wicked problem vs. a tame one (see dissertation page?) – the kinds of problems being tackled in this dissertation is clearly wicked – and be definition requires multiples narratives and perspectives to understand. To not utilize the stories of those who are closest to the problem is to deny ourselves the data we need to have hope to change the paradigm that is perpetuating this destruction. This is a significant theoretical contribution of this dissertation. It is just one tiny piece of yarn in the fabric that needs to be woven for us to have the comfort of something warm enough to shield us from the storm upon us, but it is a piece. It was built by many hands, of which mind had the tiniest role.

It has been my profoundly humble opportunity to learn from every person I have come across in this project. To all the farmers who have offered to teach me and those who will read and learn from this – thank you.
References


Inter Governmental Panel on Climate Change. 2018. “Global Warming of 1.5 Degree C.” Incheon, Republic of Korea: IPCC.


Lonsdale, Michele, and Doug McCurry. 2004. “Literacy in the New Millennium.” Australia: NCVER.


http://www2.hud.ac.uk/hhs/nme/books/2005/Chapter_1_- _Catherine_Kohler_Riessman.pdf.


Appendix

i Survey

This is the baseline survey tool given out by C-MRA to all potential farmers who partook in the FFS conducted by permEzone and C-MRA prior to exposure to the curriculum.

**FARM SURVEY TOOL QUESTIONNAIRE FOR THE PERMEZONE/C-MRA PROJECT IN ASUMBI**

**QUESTIONNAIRE S/No.**  
**DATE**  

**SECTION 1: METADATA**

**Introductory and consent statement:** “Dear Sir/Madam, I work for the permEzone project in collaboration with Community Mobilization for Regenerative Agriculture. I am conducting a survey to farmers to get their baseline data in your village. Further, the survey seeks to understand the potential economic impact and farmers’ willingness to practice permaculture. Your response to these questions would remain anonymous. Taking part in this study is voluntary. Thank you for your kind co-operation”.

<table>
<thead>
<tr>
<th>Name</th>
<th>Name of Enumerator Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of County</td>
<td>Name of County</td>
</tr>
<tr>
<td>Name of Sub-County</td>
<td>Name of Sub-County</td>
</tr>
<tr>
<td>Name of Ward</td>
<td>Name of Ward</td>
</tr>
<tr>
<td>Name of Village</td>
<td>Name of Village</td>
</tr>
<tr>
<td>Name of Farmer</td>
<td>Name of Farmer</td>
</tr>
</tbody>
</table>

**SECTION 2: HOUSEHOLD COMPOSITION AND CHARACTERISTICS**

<table>
<thead>
<tr>
<th>ID CODE</th>
<th>Name of household member [Start with respondent]</th>
<th>Sex</th>
<th>Relationship to the household head</th>
<th>Marital status</th>
<th>Education (years)</th>
<th>Primary occupation CODE 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CODE 1</td>
<td>CODE 2</td>
<td>CODE 3</td>
<td>CODE 4</td>
<td>CODE 5</td>
<td>CODE 6</td>
<td>CODE 7</td>
</tr>
<tr>
<td>1</td>
<td>AA1</td>
<td>AA2</td>
<td>AA3</td>
<td>AA4</td>
<td>AA5</td>
<td>AA6</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Code 1:
- Household head
- Spouse
- Son/Daughter
- Parent
- Daughter/son-in law
- Grandson/granddaughter
- Other relative
- Hired worker
- Other, specify…..

### Code 2:
- Married living with spouse
- Married living without spouse
- Divorced/separated
- Widow/widower
- Never married

### Code 3:
- None/illiterate
- Adult education or 1 year of education
  * give other education in years (e.g. 2 years for std 2, 8 years for class 8)
- 100. Religious education

### Code 4:
- 1. Farming (crop + livestock)
- 2. Salaried employment
- 3. Self-employed off-farm
- 4. Casual laborer on farm
- 5. Casual laborer
- 6. School/college child
- 7. Non-school child
- 8. Other, specify

### Section 3: Demographic Information

<table>
<thead>
<tr>
<th>No</th>
<th>Questions</th>
<th>Responses</th>
</tr>
</thead>
</table>
| 1  | Do you have a phone? | No………………………………………………………
<p>|    |             | Yes……………………………………………………… |</p>
<table>
<thead>
<tr>
<th>No</th>
<th>QUESTIONS</th>
<th>RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>What is your phone number?</td>
<td>Phone number:________________________________________________________________________</td>
</tr>
<tr>
<td>3</td>
<td>How many years of experience do you have in farming?</td>
<td>[___</td>
</tr>
<tr>
<td>4</td>
<td>How far is your residence from the nearest output market?</td>
<td>[___] walking minutes</td>
</tr>
<tr>
<td>5</td>
<td>How far is your homestead from the nearest agricultural extension office?</td>
<td>[___] walking minutes</td>
</tr>
<tr>
<td>6</td>
<td>How far is your homestead from the county/ sub county town/city?</td>
<td>[___] walking minutes</td>
</tr>
<tr>
<td>7</td>
<td>Distance to the nearest seed dealers/market from your homestead</td>
<td>[___] walking minutes</td>
</tr>
<tr>
<td>10</td>
<td>Distance to the nearest credit service/institution</td>
<td>[___] walking minutes</td>
</tr>
<tr>
<td>11</td>
<td>Did you borrow to finance your crop production in 2017?</td>
<td>No……………………………………………………………………………………………………………</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes……………………………………………………………………………………………………………</td>
</tr>
</tbody>
</table>

**SECTION 4: PERMACULTURE KNOWLEDGE INFORMATION**

<table>
<thead>
<tr>
<th>No</th>
<th>QUESTIONS</th>
<th>RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What crops do you grow? (let them list as you record)</td>
<td>(i)................................................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii)................................................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iii)................................................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv)................................................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(v)................................................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(vi)................................................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(vii)............................................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(viii)..........................................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ix)................................................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(x)................................................................................................................................</td>
</tr>
<tr>
<td>2</td>
<td>What is the size of your land you actively use in crop production?</td>
<td>................................................................................................................................ (Acres)</td>
</tr>
</tbody>
</table>

303
<table>
<thead>
<tr>
<th>No</th>
<th>QUESTIONS</th>
<th>RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>What are the inputs you apply in your soil? (you list as they state them)</td>
<td>(i).................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii)..............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iii)............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv)..............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(v)...............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(vii)............................................................................................</td>
</tr>
<tr>
<td>4</td>
<td>Which EPM technique do you apply in your farm to control pests and diseases? (You explain to the farmer what you mean by EPM)</td>
<td>i).................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii)..............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iii)............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv)..............................................................................................</td>
</tr>
<tr>
<td>5</td>
<td>What are the water saving techniques you use in your farm? (list as they state them)</td>
<td>(i).................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii)..............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iii)............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv)..............................................................................................</td>
</tr>
<tr>
<td>6</td>
<td>Do you grow any draught resistant crops? If yes which one? (You can give them a hint i.e. cassava, sorghum, cowpeas)</td>
<td>No..............................................................Yes.................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(i).................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii)..............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iii)............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv)..............................................................................................</td>
</tr>
<tr>
<td>7</td>
<td>Do you save and store your own seeds?</td>
<td>No.................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes.............................................................................................</td>
</tr>
<tr>
<td>8</td>
<td>What are the different types of food you and your household consume regularly?</td>
<td>(i).................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii)..............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iii)............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv)..............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(v)...............................................................................................</td>
</tr>
<tr>
<td>9</td>
<td>Do you have a functional and efficient seed storage facility? If yes, state it.</td>
<td>No.................................Yes.........................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.............................................................................................</td>
</tr>
<tr>
<td>10</td>
<td>Which technique have you come up with on your own to solve your farming problems?</td>
<td>(i).................................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii)..............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iii)............................................................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv)..............................................................................................</td>
</tr>
<tr>
<td>11</td>
<td>Are you confident in the farming</td>
<td>No.................................Yes.........................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.............................................................................................</td>
</tr>
</tbody>
</table>
No | QUESTIONS | RESPONSES
---|---|---
| practices you do? If yes, then how? | |
| 12 | Are you organized in a farmers group? If yes, how regular do you meet? | No…………………………..Yes………………………………………
| | | …………………………………………………………………………
| 13 | Do you feel there is good cohesion in your group? If yes, what shows? | No…………………………..Yes………………………………………
| | | …………………………………………………………………………
| 14 | Who makes decisions as far as the farming activities are concerned in your household? | …………………………………………………………………………
| 15 | Do you also keep livestock? If yes list them. | No…………………………..Yes………………………………………
| | | (i)………………………………………………………………………
| | | (ii)………………………………………………………………………
| | | (iii)………………………………………………………………………
| | | (iv)………………………………………………………………………
| | | (v)………………………………………………………………………
| | | (vi)………………………………………………………………………
| | | (vii)………………………………………………………………………

SECTION: 5 INCOMES AND EXPENDITURE INFORMATION

Farm Expenditures
List the crops you cultivated in the past one year and give a consolidated break down of each activity as shown in the bellow table and the costs incurred;

(i)………………………………………………………………………

(ii)………………………………………………………………………

(iii)………………………………………………………………………

(iv)………………………………………………………………………

(v)………………………………………………………………………

(vi)………………………………………………………………………

Cost of Labor:

<table>
<thead>
<tr>
<th>No</th>
<th>Activity</th>
<th>No. of times</th>
<th>No. of persons involved</th>
<th>No. of hours per day</th>
<th>How many of those were hired laborers</th>
<th>Total cost paid (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nursery establishment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Ploughing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Sowing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Mulching</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Input</td>
<td>No. of times applied</td>
<td>Amount used each time</td>
<td>Unit of application</td>
<td>Total amount used</td>
<td>Price per unit</td>
</tr>
<tr>
<td>----</td>
<td>-------------------------------------------</td>
<td>----------------------</td>
<td>-----------------------</td>
<td>---------------------</td>
<td>-------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>1</td>
<td>Seed (kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Organic manure /Compost (kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Fertilizers (list below)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>a). DAP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>b). NPK</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>c). CAN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>d). Foliar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Insecticides (list below)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Fungicides (list below)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>c)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Herbicides (list below)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>c)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Others (specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>c)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL COST……………………………….. (Ksh.)**
GRAND TOTAL EXPENDITURE (X0)………………………… (Ksh.)

House Hold Incomes

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Farming Incomes</td>
<td>Farming Incomes</td>
<td>Other Incomes</td>
<td>Other Incomes</td>
</tr>
<tr>
<td></td>
<td>AMOUNT</td>
<td>AMOUNT</td>
<td>$58</td>
<td>AMOUNT</td>
</tr>
<tr>
<td>Jan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apr</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jun</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jul</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aug</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sep</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oct</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Income</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FARMING INCOME (Y1)………………………………… (KSH.)
OTHER INCOMES (Y2)………………………………… (KSH.)
CONSOLIDATED INCOMES (Y3)………………………………… (KSH.)
NET FARMING INCOMES………………………………… (KSH.) ( Y1- X0)

SECTION: 6 PESTICIDE USE AND PERCEPTIONS ON HEALTH AND ENVIRONMENT EFFECTS

$58$ Including other member incomes flowing into the household pool of resources
1. In your opinion, are pesticides harmful to human health? 1=Yes, 2=No / /  

2. If yes kindly name the means through which people are exposed to pesticide poisoning.  
Dermal absorption  
Ingestion  
Absorption through the eyes  
Inhalation  
Other, Specify…………………………….

3. Have you or any of your household member suffered pesticide poisoning during mixing, actual spraying or after spraying in the past 12 months?  
1= Yes, 0=No / /  

4. If yes list the pesticide effects suffered …1=Dizziness, 2=Vomiting, 3=Skin irritation, 4= Headache, 5= Nausea, 6= other, specify……………………………………………………………………..  

5. In case pesticides fail to control major pests and diseases, what action do you take? 1=Increase pesticide concentration, 2=Increase frequency of spraying, 3= Change to different pesticide brand, 4= Do nothing, 5= Other, Specify………………………………………………..  

**SECTION 7: WILLINGNESS TO EMBRACE PERMACULTURE PRACTICES (POTENTIAL ADOPTION)**  
Before asking the following question, the enumerator should explain to the farmer about what permaculture is; he/she should go ahead and briefly explain about the 3 permaculture ethics to the farmer.  
Care for the earth  
Care for the people  
Fare share  

1. Are you willing to embrace permaculture?  
1= Yes / ___ / 2= No / ___ /  

2. Why?  
…………………………………………………………………………………………………………………………………………………………..  

**SECTION 8: OBSERVATIONS/ REMARKS**  
1. Enumerator’s remarks (Any important additional information)

Thank you for your time!
FARMERS’ DATA COLLECTION TOOL

1) What are the main different crops you grow in your farm?
   (i)……………………………………   (ii)……………………………………
   (iii)………………………………….   (iv)……………………………………
   (v)……………………………………   (vi)……………………………………

2) What is the size of the land you actively use for crop farming? ............ (square feet)

3) Does your farm show the following?
   (i) Increased organic matter content/ presence of decomposed & semi
decomposed plant materials? (Yes…../ No….)
   (ii) Improved water retention capacity/ holding more water after the rains?
       (Yes…../ No…) 
   (iii) Crops physically appear healthy/ foliage appearing darker than the previous
        season? (Yes…../ No….)
   (iv) Is your farm recording a higher production this season than the previous
        season? (Yes../ No…) 

4) a) Do you intercrop your farm with the following crops:
   (i) Onion (Yes…../ No….)
   (ii) Coriander (Yes…../ No….)
   (iii) Lemon grass (Yes…../ No….)
   (iv) Mexican/ African marigold (Yes…../ No….)
   (v) Others (Specify)………………………………………………………………..

   b) Do you spray using?
   (i) Chilli concoction (Yes…../ No….)
   (ii) Tythonia concoction (Yes…../ No….)
   (iii) Garlic/ Onion concoction (Yes…../ No….)
(v) Dust your stored grains using wood ash to control weevils (Yes…./ No….)
(vi) Dust your stored grains using dry cow dang to control weevils (Yes…./ No….)
(vii) Others (Specify) ................................................................................

c) Do you use traps (yellow & or blue stickers) to trap insect pests? (Yes…./ No….)
d) Do you allow chickens into your orchard to feed on the insects? (Yes…./ No….)
e) Do you pick and kill insect pests yourself? (Yes…./ No….)

5) Do you apply the following techniques in your farm:
   (i) Mulching? (Yes…./ No….)
   (ii) Cover-cropping? (Yes…./ No….)
   (iii) Swales? (Yes…./ No….)
   (iv) Rain water harvesting using tanks/ buckets/ underground tanks? (Yes…./ No….)
   (v) Terraces? (Yes…./ No….)
   (vi) Other technique that conserves moisture in your farm
        (Specify) ................................................................................

6) Do you have the following structures to store your seeds from your harvest to plant
   the following season:
   (i) Granary (Yes…./ No….)
   (ii) Pic bags (Yes…./ No….)
   (iii) Hang in the kitchen to preserve by smoking (Yes…./ No….)

7) a) Did you lend any farmers seeds from your own harvest? (Yes…./ No….) If yes,
       kindly list them................................................................................
   b) Did you borrow seed(s) from any farmer(s) from their harvest? If yes kindly list the
       seeds..............................................................................................

8) Do you grow:
   a) Cassava (Yes…./ No….)
   b) Sorghum (Yes…./ No….)
   c) Sweet potatoes (Yes…./ No….)
   d) Millet (Yes…./ No….)
   e) Cow pea (Yes…./ No….)
   f) Pigeon pea (Yes…./ No….)
   g) Any other drought resistant crop (Specify) ...........................................

9) In addition to the common staple food i.e. “ugali” and kales/ local vegie (black night
    shade) what protein(s) foods do you supplement with at least 2 times a week in your
    household?
(i) Eggs (Yes../ No….)
(ii) Beef (Yes../ No….)
(iii) Chicken (Yes../ No….)
(iv) Beans (Yes../ No….)
(v) Milk (Yes../ No….)
(vi) Others (Specify)........................................................................................................

10) Have you come up with any new technique to solve your farming challenges? (Yes../ No….). If yes kindly list them
   (i).........................................................................................................................................
   (ii).........................................................................................................................................
   (iii).........................................................................................................................................

11) Do you feel that the farming methods you are practicing are better than the methods you did before? (Yes../ No….)

12) a) How many farmers in the neighborhood are learning and implementing the farming techniques that you are practicing.

   b) What are these techniques?.................................................................................................................................
   ...........................................................................................................................................................................
   ...........................................................................................................................................................................
   ...........................................................................................................................................................................

13) How regularly do you hold your group meetings?
   (i) Weekly (Yes../ No….)
   (ii) Fortnightly (Yes../ No….)
   (iii) Monthly (Yes../ No….)
   (iv) Quarterly (Yes../ No….)
   (v) Semi-annually (Yes../ No….)
   (vi) Annually (Yes../ No….)
   (vii) Never (Yes../ No….)

14) How often do you experience conflicts in your group?
   (i) Weekly (Yes../ No….)
   (ii) Fortnightly (Yes../ No….)
   (iii) Monthly (Yes../ No….)
   (iv) Quarterly (Yes../ No….)
   (v) Semi-annually (Yes../ No….)
   (vi) Annually (Yes../ No….)
   (vii) Never (Yes../ No….)
15) Do you have a say as far as farming activities are concerned in your household farm such as, being involved in;
   (i) The crop to be planted (Yes…../ No….)
   (ii) When to prepare the land (Yes…../ No….)
   (iii) The type of farming inputs to be used (Yes…../ No….)
   (iv) Controlling the farm expenditures (Yes…../ No….)
   (v) Controlling the farm incomes (Yes…../ No…..)
iii Schedule for Workshop #3 Intervention:

Co-created statement of purpose: An “improved participatory photography” workshop is being planned, with two sessions total, one each on Sat. & Sun, dates TBD. Its purpose will be to improve photography for (1) data collection, evaluation and reporting, (2) to have participant-made photos be more centrally featured in digital media spaces, and (3) more objectives to come. Emphasis will be on how to interpret photography and take fewer, higher quality, storytelling-oriented photos.

Meeting Notes: Paul and Colin
Are participants aware of the concept of "participatory tools" / "participatory development" using the word "participatory"? Does it need to be introduced? Are they aware of a methodology like PRA?
Yes
Is a follow up workshop possible to talk more about photography techniques like composition and editing?
Editing capabilities of cameras, apps and participant skills are so variable, it may be too much to cover in this event.

Yes move more of the photo technique to second workshop

Bondo case is good: C-MRA is including youths, elderly in their work. Useful to have a geographically relevant case.

OK to use photos from C-MRA FB page. Paul and Sheena took most of them.

Photo / media creation is for participants themselves, for CMRA and pEz social media, M & E media and reports

To have more than one workshop at two hours each session; instead of one, two sessions, three hours each (as currently). Allows for later start time, less info to avoid overwhelm, and for less challenging time zone issues (not so late for Colin)

Yes, in process
Photos can be printed in Kisumu
Intro to Google Maps exercises - Paul finds Google Maps useful and promising

Is it possible to look at a Google Map to locate and plot some program areas?

Yes, we did a great set of into exercises

Day 1

<table>
<thead>
<tr>
<th>Event Time</th>
<th>TBD</th>
<th>TBD</th>
</tr>
</thead>
</table>

313
<table>
<thead>
<tr>
<th>Field Time</th>
<th>8-11am EAT</th>
<th>9pm-12am PST</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leaders Meet</strong></td>
<td><strong>Time</strong></td>
<td><strong>Paul</strong></td>
</tr>
<tr>
<td>800 AM</td>
<td>900 PM</td>
<td>Arrive early to prepare</td>
</tr>
<tr>
<td>815 PM</td>
<td>915 PM</td>
<td></td>
</tr>
<tr>
<td><strong>Preparation time</strong></td>
<td>830 PM</td>
<td>Arrive early to prepare</td>
</tr>
<tr>
<td>845 PM</td>
<td>945 PM</td>
<td>Arrive and get settled</td>
</tr>
<tr>
<td>900 PM</td>
<td>1000 PM</td>
<td>Arrive and get settled</td>
</tr>
<tr>
<td>915 PM</td>
<td>1015 PM</td>
<td>Sharing with Colin</td>
</tr>
<tr>
<td><strong>930 PM</strong></td>
<td><strong>1030 PM</strong></td>
<td>Farmers break up into pairs (5, for 10 farmers total) to further discuss (1) data collection process, and (2) role of photography and storytelling / communications in their lives</td>
</tr>
<tr>
<td><strong>945 PM</strong></td>
<td><strong>1045 PM</strong></td>
<td>Foundations and History of Photography</td>
</tr>
<tr>
<td>Time AM</td>
<td>Participants</td>
<td>Time PM</td>
</tr>
<tr>
<td>---------</td>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>800</td>
<td></td>
<td>900</td>
</tr>
<tr>
<td>815</td>
<td></td>
<td>915</td>
</tr>
<tr>
<td>830</td>
<td>Arrive early to prepare</td>
<td>930</td>
</tr>
<tr>
<td>845</td>
<td>Arrive and get settled</td>
<td>945</td>
</tr>
<tr>
<td>900</td>
<td></td>
<td>1000</td>
</tr>
<tr>
<td>915</td>
<td></td>
<td>1015</td>
</tr>
<tr>
<td>930</td>
<td></td>
<td>1030</td>
</tr>
<tr>
<td>945</td>
<td></td>
<td>1045</td>
</tr>
<tr>
<td>1000</td>
<td>Meet with Colin</td>
<td>Break</td>
</tr>
<tr>
<td>1015</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Workshop 2: Editing & Sharing

Introducing photography: editing
- Techniques and technology

Introducing photography: Sharing
- Technology

Paul

The woman in soiled clothes swinging the Jembe is working the land, but the sister in the clean clothes may just be harvesting to tend to the children

Leading lines – bringing pointed visual attention to your main subject
- strong focal point – your main subject should obviously, visibly, stand out in the photo
- framing – use elements of the surrounding and background to "frame" your subject
- bring your subject to forefront – avoid cluttering your composition
- include appropriate environmental elements in surroundings & background – visual elements surrounding your subject should “tell the story” or enhance the message of the photo
- look at the light – it should be coming toward your subject, preferable at an offset angle, rather than back-lit or directly-lit overhead. Position yourself and your subject for the best light.

Links to studies and resources

| Engaging the Public in Health and Community: A Photo-voice Workshop |
| "I washed and fed my mother before going to school": Understanding the psychosocial well-being of children providing chronic care for adults affected by HIV/AIDS in Western Kenya |
| Picturing Social Change: Photovoice for health, Community and development https://www.youtube.com/watch?v=LYYlllmr0sw |

316
Picturing the Coping Strategies of Caregiving Children in Western Kenya: From Images to Action: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3036692/
Interview Questions for Paul Omollo:

This interview was a dialogue and conversation, rooted in some formal questions that we would riff off of. The main questions are noted below with some context offered as needed:

We went over a discussion together about how critical literacy works around ideas of naming, reflecting, and then acting on a phenomena (praxis) – especially this idea of code breaking and participating in looking critically at culture when considering knowledge creation. I then asked Paul after we discussed this component of the curriculum that he had taught, which I was having a hard time analyzing in the attained curriculum: "were they metrics for this?"

Similarly, Paul and I discussed biophilia as part of permaculture philosophy. I asked Paul several questions in our interview around this including:

In what ways is biophilia explored in the curriculum?

Are you surprised that it wasn't expressed more explicitly in the data?

How did you approach expressing this in the FFS?

We also discussed ways that gender has played a role in farming in East Africa to get into a flow of conversation around this topic upon which I asked Paul a few questions:

Are there ways in which you have noticed gender showing up within your work in agriculture in general, how does/n't this manifest?

- Were there specific examples you saw in Asumbi?
- Were any of these addressed explicitly in the FFS permaculture curriculum?
- Did you notice any changes after exposure to the curriculum? What did those look like (follow up)?

I mentioned to Paul the manner in which we had examined the data together, and interrupted our data collection because of a feedback loop (continuous evaluation) and some concerns we
had, which led to the third workshop with Colin around photography/skilling up. I noted this was an example however of more managerial level feedback loops and asked:

*Are there examples of front line continuous evaluation feedback loops?*

Paul then reminded of one I had myself been involved in co-creating (see Appendix ii) and then explained its implementation and some of the reasons it evolved the way it did, and deviated from the initially intended plan due to rollouts of other programming in the region.
Key Premises

PermEzone’s MEL framework is rooted in permaculture ethics and principles and as such advocates a bottom up and adaptive approach that values the richness of farmers local knowledge and encourages regular reflection on what works and what doesn’t in order to improve.

The key premises of the MEL framework are:

- The MEL process has as its key aim to help farmers evaluate and reflect upon the changes in their lives and give them a framework and tools to continue this process beyond the scope of the project.
- In order for the MEL to be relevant to farmers’ lives and make sense to them, farmers need to be involved in the process of developing key indicators to measure change in their lives.
- Farmers are holders of important local knowledge and their views and input throughout the process need to be seen as equally important as those of project managers, advisors and funders.

Therefore, the PermEzone MEL framework ensures that:

- Farmers are involved in developing indicators of change and surveys to measure this change
- Farmers work together to develop farm records to keep track of changes
- Farmers and project staff have a reflection process at the end where farmers have the opportunity to give input on what worked and what didn’t and how that could improve.
- Data collected during the course of the project is presented to farmers and farmers are given the opportunity to analyze and evaluate and give input.

Farm Minimum Standards

The PermEzone MEL framework is based on participatory methodologies and farmer field school approaches that encourages farmers to develop their own curiosity and experimentation.

In consultation with farmers who formed part of the three-year pilot, a set of ‘Farm Minimum Standards’ have been developed. These minimum standards are rooted in permaculture
principles and ethics and are at the heart of the MEL process. Farmers progress is measured against these as well as a set of indicators developed by farmers themselves to measure their perceived change in terms of resilience and agency.

The **purpose** of the Farm Minimum Standards is to ensure PermEzone projects keep permaculture principles and ethics at heart as well as ensuring consistency and quality as the PermEzone project is being rolled out to more farmers.

**Farm Minimum Standards**

<table>
<thead>
<tr>
<th>Resources</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer maximizes the use of locally available resources to increase and diversify production and reduce dependence on external inputs, including saving their own seeds.</td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td>Farmer has a plan for their farm based on their own observations of their landscape and with the aim of maximizing production and minimizing time and energy.</td>
</tr>
<tr>
<td>Water</td>
<td>Farmer uses multiple strategies to slow, spread and sink and manage rainwater and other water resources including recycling of greywater.</td>
</tr>
<tr>
<td>Soil</td>
<td>Farmer is using a variety of methods to create a healthy soil food web such as composting, living and dead mulches and application of animal manures and soil amendments.</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>Farmer has a diversity of plants and trees with different functions, including food crops, cover crops, fertilizer plants and pest repellant plants.</td>
</tr>
<tr>
<td>Protection</td>
<td>Farmer has a variety of strategies to protect their soils and plants from any negative influences such as cover crops and mulches to protect soils, trees to act as windbreak and protect from harsh winds and strong sun and fencing to protect plants from grazing animals.</td>
</tr>
<tr>
<td>Adaptation</td>
<td>Farmer is continually observing and recording feedback from their farm and the surrounding environment and adapting their practices to improve production and resilience.</td>
</tr>
</tbody>
</table>

The Farm Minimum Standards is the basis for a survey that project managers will go through together on a regular basis to check progress on the farm and discuss challenges and problem solve together.
vi. Participatory Workshops

Aim of participatory workshops:

- Develop a definition of ‘resilience’ and ‘empowerment’ according to the farmers of the project
- Develop indicators for how to measure change in ‘resilience’ and ‘empowerment’
- Develop a survey to measure the indicators

Reflection + data analysis with farmers

An important part of the MEL process is getting farmers input on the process itself as well as the data collected.

A reflection workshop at the end of the project allows farmers to give their perspective on how the project and the MEL process has worked for them and most importantly what could be improved.

Presenting the data collected to farmers is equally important and gives farmers an opportunity to give their analysis, perspective and insight on the data collected.

Participatory Workshops Outlines

First participatory workshop

Participants: Lead farmers in the project

Introducing the workshop

Facilitator introduces the workshop within the context of the project:

- Resilience and agency/empowerment is at the heart of the project, at the end of the project we hope to see farmers more resilient and empowered.
- Farmers knowledge is key to the project
- Measuring change needs to involve farmers in defining what change should look like and how to measure it.

Defining ‘Resilience’ and ‘Agency’

1. Facilitator introduction:
   - First part: defining what resilience and agency/empowerment means to this group of farmers in order to then develop indicators for how to measure change in these areas in farmers lives.

2. Discussion: What do we mean by ‘resilience’
a. Ask farmers what comes to mind when they hear the word ‘resilience’
b. Model by giving some examples

i. For example: Using a rubber ball and a mud ball, tell farmers that they each represent one household, ask them to observe what happens when a shock such as a drought happens and drop the two balls on the ground. Ask farmers which one was more resilient—the rubber ball or the mud ball?

ii. Using the example of the rubber ball’s ability to ‘bounce back’ discuss what this looks like for farmers.

1. Do they know anyone who has a very resilient farm or a person who is very resilient and able to deal with challenges?
2. What characteristics do they have?

3. Group work: What is our definition of ‘resilience’?
   a. Farmers work together in groups
   b. In plenary together with the facilitator come up with a group definition of ‘resilience’.

4. Discussion: What do we mean by ‘Agency’/ ‘Empowerment’?
   a. Ask farmers what comes to mind when they hear the word ‘Agency’ or ‘Empowerment’
   b. Ask farmers which word they prefer to use – ‘agency’ or ‘empowerment’
   c. Continue probing with some more questions:

   i. What does it look like when someone is ‘empowered’ / ‘have agency’?
   ii. What are the things that tell you someone has agency or is empowered?
      1. For example: they have a say in decision making in the household, they have independence and can set up their own projects etc.

5. Group work: What is our definition of ‘agency’/ ‘empowerment’.
   a. Farmers work together in groups
   b. In plenary together with the facilitator come up with a group definition of ‘agency’/ ‘empowerment’.

6. Plenary: Defining ‘resilience’ and ‘agency’.
   a. Facilitator presents the two group definitions.

Developing our indicators for ‘resilience’ and ‘agency’/ ‘empowerment’.

1. Facilitator intro
   • Second part: Using the definitions developed, developing indicators for how to measure what it means to be resilient and be empowered/ have agency.
   • Facilitator defines indicators and what they can look like, giving examples.

2. Group work: How do we measure if we are ‘resilient’ and have ‘agency’/ ‘are empowered’.
   a. Farmers work together in groups
   b. Groups present their works to each other

3. Plenary discussion: Together with farmers facilitator work to consolidate the key indicators to use to measure change in ‘resilience’ and ‘empowerment’ in farmers' lives.
   4. Select a small group of farmers to work on developing a survey to use to measure indicators.
vii. Interview Questions Submitted to Farmers in Asumbi Village:

- What was the most significant change in your life as a result of this project? Why was this change so significant?
- What do you think about the relationship between loving life and regenerative farming? In what ways were you exposed to ideas about appreciating a love for live and living ecosystems in this curriculum?
- In what ways has this learning experience changed the relationship between how men and women interact about decisions on farming? For instance, what crops to grow or how money is spent.