



Norwegian University
of Life Sciences

Master's Thesis 2020 30 ECTS

BIOVIT

Answering the Call: Motivation and Experiences of Leaders in the Global Regenerative Forestation Movement

Mallika Nair

MSc Agroecology

Answering the Call: Motivation and Experiences of Leaders in the Global Regenerative Forestation Movement

Thesis for MSc Agroecology degree at the Norwegian University of Life Sciences (NMBU)

Written by Mallika Nair

Thesis Supervision by Professors Charles Andrew Francis (NMBU), and Darley Kjosavik (NMBU)

Abstract

Forestation, the planting and cultivation of trees, is an important strategy utilized by community groups, farmers, NGOs, and governments, to counteract catastrophic climate change. Regenerative forestation is an ecological approach to forestation that also considers stakeholders, with a focus on benefits to the local community. This exploratory study identifies commonalities in motivations, experiences, ecological and movement building practices, and ways of knowing the natural world that inform the work of leaders in the regenerative forestation movement. Through interviews with renowned tree planting activists from around the world, an organizing theme emerged: the incorporation of ways of knowing, akin to those found in indigenous science and traditional ecological knowledge, was essential to interviewees' approaches to regenerative forestation. The research draws its transdisciplinary theoretical foundations from Indigenous Science and Systems Theory, and builds on existing research in forest and landscape restoration, environmental volunteerism and motivation, and ways of knowing.

Key Terms: Regenerative Forestation, Indigenous Science, Environmental volunteerism, Motivation, Ways of Knowing, Tree Planting, Agroforestry, Movement Building, Forest and Landscape Restoration, More-Than-Human World, Agroecology, Leaders, Traditional Ecological Knowledge

Acknowledgements

Thank you to my advisors Professors Chuck Francis and Darley Kjosavik for your support and guidance on how to approach this topic of study. I also want to share appreciation to the whole Agroecology department at NMBU for grounding my approach in systems theory and a transdisciplinary approach to learning.

The process of conducting this study -- the interviews, research, site visits, and campouts involved -- has shown me that large-scale agroecological restoration is possible, and within reach. Thank you so much to all who were interviewed for the purpose of this study, as well as those who took time to help connect me to their colleagues and friends for interviews. Your insights and candor greatly enriched the research, and I appreciate your willingness to share about your experiences, and your perspectives.

I feel grateful for the opportunity to study and live in Norway, the semester I spent in Vienna, Austria studying at BOKU, and my travels to Ireland and India during my graduate program. This time away from my home country expanded my thinking and situated me in a global community at the intersections of agroecology, art, and social change. Gratitude to my family and friends for your support and encouragement throughout this process. Special thanks also to Jamie Whalen for your help in proofreading my writing.

Lastly, tusen takk to the forests -- the “standing ones”. I’m especially grateful to the mossy evergreen forests of Ås, Norway, and the Oak groves and Redwood forests of my home in Northern California that sheltered, fed, and inspired me during the course of this research.

Table of Contents

ABSTRACT	1
Key Terms	1
ACKNOWLEDGEMENTS	2
TABLE OF CONTENTS	3
List of Tables	4
INTRODUCTION	5
Land Degradation and Global Commitments to Forestation	5
Regenerative Forestation	6
Studying Leaders in the Tree Planting Movement	8
Theoretical Foundations to Frame a Global Movement	9
RESEARCH QUESTIONS	12
METHODS	13
RESULTS	16
Ecological Practices	16
Tree Nurseries	17
Proper Post-Planting Care and Maintenance	18
Agroforestry	19
Earthworks and Water Management	20
Traditional and Cultural Practices	21
Urban Forestry	23
Composting and Mulch	24
Focus on Equatorial Regions	24
Natural Regeneration	25
Principles	27
Movement Building	28
Motivations	28
Partnerships to build the movement	29
Decentralized Media	29
Centering Marginalized Communities	30
Funding the Movement	33
Sharing Knowledge: Education and Trainings	35
	3

Relationship with the More-than-Human World	37
Communication from the More-than-Human-World	37
Non-Linear Ways of Knowing	41
Childhood & Family Connection to Nature	44
DISCUSSION	46
Applying an Indigenous Science Lens	47
Limitations to the Study	51
Insights from the Field of Agroecology	53
REFERENCES	55
APPENDIX	63
Interview Guide	63
Critical Distinctions of Indigenous Science	64

List of Tables

Table 1. Ecological Principles and Applications in Regenerative Forestation (p. 27)

Table 2. Methods of Perceiving Information from the More-than-Human World: In Their Own Words (p.42-44)

Introduction

In response to the interrelated social and environmental crises of our time, this research looks towards the promising field of regenerative forestation through the perspectives of some of its leaders. To introduce the research, background on the need and potential for forestation, an explanation of what kind of forestation can be considered regenerative, a brief review of existing research on motivation in environmental volunteers, and further information on theories that inform the framing of the study is provided.

Land Degradation and Global Commitments to Forestation

Tree planting is recognized as one of the most impactful measures to prevent and counteract catastrophic climate change (Hawken, 2017), and a cost effective way to regenerate land and stop the spread of desertification. Forestation -- the planting and cultivation of trees and forests -- can restore natural water systems, and rebuild habitat to support wildlife, while providing food, and other products to local communities.

Restoration efforts are direly needed, as forest and land degradation affects over one third of the earth's human population (Sabogal et al., 2015), and an estimated 74% of the world's poor (Bonn Challenge). Degradation is defined by the FAO as a persistent decline in land or forests' ability to provide goods and services, including ecosystems services such as water cycling, habitat, carbon sequestration, and goods including food, other NTFP's (non-timber forest products) and lumber (FAO cited in Sabogal et al., 2015).

Recognizing the vast need and opportunity, governments around the world have made commitments to tree planting efforts, often tied to their goals around carbon emissions. In 2019, Ireland, Ethiopia and India have made headlines for their tree planting commitments and large-scale, record-breaking plantings (Nace, 2019; Paget & Regan, 2019). Ethiopia just set the world record for most trees planted in a day with 353 million trees planted in July 2019.

Forestation efforts are being funded through carbon trading schemes and by environmental NGOs (Pincetl et al, 2012). As a part of a global push for forestation, the Bonn Challenge was launched by the International Union for Conservation of Nature (IUCN), and the Government of Germany in 2011, and currently has 62 commitments from countries around the world, and goals to restore 150 million hectares of deforested and degraded lands by 2020, and 350 million hectares by 2030 (Bonn Challenge, n.d.).

Regenerative Forestation

Within the field of restoration, there is a growing focus on taking a landscape approach, which recognizes the interrelated parts of the ecosystem and works with all stakeholders, and crucially, involves local communities (Sabogal et al., 2015).

This lens is important because as large-scale tree plantings have proliferated, ecologists and other scholars warn that not all tree plantings are designed or executed in an ecologically informed or socially just way. Many tree planting schemes are monoculture style plantings with trees planted in dense configurations, in rows, and designated to be cut for lumber in just 10-15 years, negating their potential status as a long-term carbon sink (Chazdon & Brancalion, 2019). These unnatural forests do not provide the same ecosystem services, carbon sequestration, nor do they provide habitat, or non-timber forest products (NTFPs) in the same way that forests in natural succession do.

Furthermore, planting and/or conservation of forests for carbon credits can perpetuate injustices to local communities and further damage to the local ecosystem on which they rely. For example, tree plantings in Ireland are being pushed forward without local community support of farmers, and primarily use nonnative tree species in extremely dense configurations - plans that locals have been organizing against (Carroll, 2019). There are many even more egregious cases of forest management being carried out in a way that disregards local community autonomy and violates human rights. For example, the UN's REDD scheme has been

widely criticized for forcibly removing indigenous peoples in South America from their lands and carrying out further colonialism in the name of carbon sequestration (Bayrak & Marafa, 2016; Cabello & Gilbertson, 2012).

Complexities abound, socially, ecologically, and geopolitically. There are many factors to consider including the tree species selected for the site, genetic compatibility and diversity of the sapling/seed stock, the design of the planting, and the local (and changing) climate. Additionally, how the planting is designed and managed especially with regards to funding, longevity of the project, and relationship to local stakeholders, are essential considerations in whether a forestation project can be considered regenerative or if it can actually cause harm to the local ecosystem or inhabitants (Chazdon & Brancalion, 2019; Thomas et al., 2015).

Leaders in the field, such as John Liu from Ecosystem Restoration Camps, and Akira Miyawaki have been demonstrating more natural, and high carbon sequestering methods of reforestation through using native species, site appropriate earthworks, and dense interplanting which can create rich and diverse forests even in small spaces (Liu & Hiller, 2016; Sharma, 2014). Agroforestry, that is the interplanting of woody perennials with other agricultural crops, is an important element of regenerative forestation with multifaceted benefits that is also widely recognized for its ecological and social benefits. Natural regeneration -- in which degraded areas are left alone and/or managed with minimal human intervention to allow forests to grow back -- is another strategy to grow forests.

For the purpose of this thesis, research will be conducted on forestation work that is ecologically sound, and has other benefits including ecosystem services, and social/economic benefits for the local community -- a style of forestation that is sometimes referred to as forest and landscape restoration (FLR) in the literature (Sabogal et al., 2015) and will primarily be referred to here as regenerative forestation.

Studying Leaders in the Tree Planting Movement

Tree planting projects are largely accomplished through the work of citizens and community groups that are responsible for coordinating volunteers and local people to improve soil, clean up polluted sites, and replant trees (Maathai, 2010).

Environmental volunteerism has been studied in various contexts as a phenomenon that is vital in preserving and maintaining ecosystems, an action-oriented part of environmental education, and as a way of building civic identity (Liarakou et al., 2011; Bruyere & Rappe, 2007). The available research on environmental volunteerism has evaluated motivation, and differentiated between intrinsic motivation (altruism, sense of satisfaction) and extrinsic motivation (increase in knowledge, skills, career training, relationships) amongst volunteers. The current research on environmental volunteer motivation has shown a variety of most cited motivations, notably desire to help within an area of interest, spend time outdoors, and increase knowledge and experience in a given field.

This thesis research seeks to build on the body of work about environmental volunteers' motivation, by shifting focus to the motivation of *leaders* of environmental organizations, who have successfully engaged and activated volunteers to participate in collective action towards regenerative forestry. Each person who starts or directs an organization catalyzes hundreds, sometimes thousands, even hundreds of thousands of others into action. This research will look into what has spurred these people, themselves, into action. What has made them devote their lives to the work of regenerative forestation? What similarities are there in the stories of how their projects were initiated, and what commonalities can be found in their worldviews, and perspectives on their relationship with the natural world?

As climate crisis escalates, the “mismatch between human capacities to act and the scale, scope, and immediacy of collective action seemingly demanded” is becoming more evident

(Dryzek et al., 2011). Coordinated efforts are needed, and therefore a “leaderfull” (as opposed to leaderless) movement is needed (NPR, 2015). Through a phenomenological approach that attempts to understand the subjects’ own lived experiences, this research aims to bring increased scholarly attention to the rich and diverse ways of knowing that underlie the current wave of thinking in the environmental movement.

Theoretical Foundations to Frame a Global Movement

This study is informed by systems theory’s articulation of holons (nested wholes, systems and subsystems) and the concept of emergence (Macy, 2012). As the movement appears to be co-arising across the planet in disparate regions and cultures, it may be also conceptualized as a systemic response to ecological imbalance from Gaian perspective (Harding, 2009). Though Gaia theory has been controversial amongst scientists since the time it was articulated in 1974 (Lovelock & Margulis, 1974), it has nonetheless persisted widely in popular culture (Harding, 2009), and has resonance with indigenous, animistic, deep ecology, and ecofeminist lineages. Gaia theory posits that the Earth has a self-regulating capacity, may function in ways similar to an organism, and may have some sort of unifying consciousness. Gaia theory can serve as a framework to conceptualize forestation efforts as an emergent collective response to climate crisis -- as a global movement emerging across cultures and in collaboration with the more-than-human world. The term “the more-than-human world”, was coined by David Abram and is used in this study to anchor the research with terminology that honors the inherent value and life present in the non-human world (Abram, 2017).

In a similar vein, this study is most heavily informed by an indigenous science perspective. Scholars working on widening the scope and ability of science to build knowledge about the living world are actively decolonizing the field of science and explicating the foundation for what is called indigenous science. A subset of indigenous science is commonly referred to as traditional ecological knowledge (TEK) or indigenous ecological knowledge (IEK) in academic texts (Bonta et al., 2017).

Indigenous ecological knowledge and the indigenous sciences that developed that base of knowledge are proven by thousands of years of sustainable management of ecosystems, and also by more recent years of studies undertaken from the Western Modern Science (WMS) perspective (Sniveley & Corsiglia, 2000). It is becoming more widely understood that “protecting indigenous land rights and tropical forests goes hand in hand” (Kennedy, 2019), and that fortress conservation, in which all human activity is prohibited in protected areas, is not as effective as protecting indigenous rights to manage, live in and use forest resources responsibly (Tauli- Corpuz et al., 2018).

Indigenous sciences, and the related theories of deep ecology, and systems theory are used as a frame for this study to invite the holistic lens that they are based in, and which is a foundational tenet of agroecological learning.

As we become a global community, it is valuable to interrogate our epistemologies in the West and look for opportunities to merge with Earth ways of knowing in order to create more equitable, inclusive and wholistic ways of knowing, for us all (Sheperd, 2016).

WMS has been implicated in many of the world’s ecological disasters, and the traditional wisdom component of TEK is particularly rich in time-tested approaches that foster sustainability and environmental integrity (Sniveley & Corsiglia, 2000).

Indigenous science and Western science are similar in that “both are constantly verified through repetition and verification, inference and prediction, empirical observations and recognition of pattern events” (Nicholas, 2018). However, indigenous science also uses a set of principles and values, and a different orientation towards wisdom and knowledge production, that appears to be greatly needed in our current moment of climate crisis.

There are nine critical distinctions of Indigenous Science as described by Pamela Colorado in a 1994 report including:

All of nature is considered to be intelligent and alive thus active research partners. We do not act on nature rather we communicate and work with nature.

The purpose of indigenous science is to maintain balance.

Indigenous science is concerned with relationships, we try to understand and complete our relationships with all living things.

Indigenous science is holistic, drawing on all the senses including the spiritual and psychic.

The endpoint of an indigenous scientific process is a known and recognized place. This point of balance referred to by my own tribe, as the Great Peace, is both peaceful and electrifyingly alive. In the joy of exact balance, creativity occurs...

Humor is a critical ingredient of all our truth seeking, even in the most powerful rituals...

(An unabridged excerpt with the full list of distinctions is made available in the appendix)

This explanation is similar to David Abram's list of commonalities identified in indigenous worldviews. He states "While indigenous, oral cultures tend to be exceedingly different from one another, it is nonetheless possible to discern several intuitions and qualities that they hold in common." In an essay entitled "A More Than Human World" (2019) he shares the following observations of commonalities across indigenous cultures and those with oral traditions:

Oral awareness is intensely local in its orientation...

The simple act of perception is experienced as an interchange between oneself and that which one perceives – as a meeting, a participation, a communion between beings...

Each perceived presence is felt to have its own dynamism, its own pulse, its own active agency in the world... the surrounding world, then, is experienced less as a collection of objects than as a community of active agents, or subjects...

To an oral culture, the world is articulated as story...

The curvature of time is here inseparable from the apparent curvature of space; and indeed both remain rooted in the round primacy of place...

As players within an expansive, ever-unfolding story, our lives are embedded within a psyche that is not primarily ours....carnally immersed in an awareness that is not ours, but is rather the Earth's...

The wild mind of the planet blows through us all, ensconced as we are in the depths of this elusive medium...

These concepts echo Colorado’s list of distinctions of indigenous sciences as quoted above and another notable indigenous professor, Robin Wall Kimmerer’s teachings on weaving indigenous knowledge into modern systems, be they academic, governmental, or familial. Kimmerer emphasizes the importance of a “language of animacy”, storytelling, reciprocity, and allowing our natural sense of curiosity, aesthetic, and care for the world and each other, to guide our actions and our approach to science (Kimmerer, 2013).

Current research has identified feeling, intuition, and experience as ways of knowing that are valued in deep ecology, ecofeminism, and various indigenous cultures (Booth, 2000). There is a gap in knowledge about how these ways of knowing inform contemporary environmental leaders. Accordingly, this research will also inquire about how these ways of knowing, akin to those of indigenous sciences, inform the work of environmental and social leaders in the regenerative tree planting movement.

Research Questions

- What motivates people to start and direct regenerative forestation projects?
- What are these leaders’ common visions, best practices, and experiences in organizing forest and landscape restoration work?
- In what ways do leaders engage in ways of knowing, akin to those found in indigenous sciences, that informs their work?

Methods

Research was conducted through semi-structured interviews with leaders of regenerative forestation projects. Interviewees were posed a series of questions about how they conceived of and initiated the work, their sense of communication with and/or guidance from the more-than-human world, their organizations' ecological practices which make their work regenerative forestry, and how they participate in building the movement and sharing their vision. They were also given a chance to share more broadly about their lessons and experiences in organizing forest and landscape restoration work.

The research was conducted using a phenomenological approach to primarily document and analyze the leaders' inner perceptions and lived experiences of their inspiration and their work. The study was designed in alignment with the branch of phenomenological methods called hermeneutical, or interpretative - that studies the experience of subjects and makes meaning of it, and also acknowledges the identity, biases, and positionality of the researcher (Neubauer, 2019). In this case, since the researcher, herself, is active in the field of restoration and previously held a role as a director of a tree planting organization, the dynamic of being a researcher as well as participant in the field must be acknowledged. The researcher aimed to ask open ended questions (see interview guide in appendix) and apply the hermeneutical phenomenological approach in which the researcher is to bring an "attitude or disposition of sensitivity and openness: it is a matter of openness to everyday, experienced meanings as opposed to theoretical ones" (Van Manen, 2002, cited in Friesen et al., 2012)

In keeping with guidelines for a hermeneutical phenomenological approach, interviews were selected, as opposed to other less personal research methods such as surveys. Furthermore, as the topics covered in the interviews included personal history, and philosophical concepts, some depth of conversation was required. Methods, questions, and research protocols were cleared with the NSD - the Norwegian board for ethical considerations around privacy, consent,

and data protection. In accordance with NSD protocols, all subjects interviewed were given a detailed letter explaining the research, use, and storage of the data, asked to confirm their consent to participate, and were informed that they can withdraw their consent at any time.

Four interviews were conducted in person, five were through online video chat, and five were through phone interviews in cases where interviewees did not have adequate internet speeds for video chat. In one case, a translator was also present on the call. In all cases the interviews were conducted in English.

Interviews were conducted with 14 leaders of regenerative tree planting organizations. Leaders were to be of any age (above 18 years of age), any gender identity, any ethnicity, and from any country of origin. Leaders were defined as those who play a crucial role in their organization such as organizational founder, organizational director, director of tree planting, or director of tree planting for a particular region. The criteria for interviewees were based on the eligibility requirements that were determined for their organizations - see below.

Eligible Organizations:

- have coordinated large community tree plantings (defined as over 50 people participating to plant trees, OR over 1,000 trees planted).
- conduct their tree plantings using ecologically sound methods (with regards to species selection, method of planting, organic fertilizers and pest control; see section on regenerative forestry above).
- utilize volunteers and/or mobilize community members to participate in the work of planting.
- have a stated mission that includes social and ecological outcomes for their plantings.
- are accessible and willing to collaborate for the purpose of the study.

Twenty-five leaders of eligible tree planting organizations were contacted through the researcher's networks and via contact information posted on the selected organizations'

websites. Leaders of organizations that do work around the world were contacted, with hopes that participants in the study would come from and/or be working in diverse regions. Each interviewee was also asked to recommend others leaders in the field for the researcher to contact, in accordance with the snowball sampling method. One pilot interview was conducted as a test run of the interview questions, after which questions were slightly refined. The data from the pilot interview were also included as data in the study. The interview guide is made available in the appendix.

Due to the limited time frame for the study, as well as the exceptional global circumstances of the Spring of 2020, when research was being conducted, the study uses a rather limited sample size. The study is not intended to be representative of the entire field of work, and is intended to be an exploratory study that provides insights and raises topics of interest for further inquiry.

The interviews were recorded with permission using an audio recording device. The researcher also took notes during the interviews. After all the interviews were conducted, data from each interview were organized using a spreadsheet to identify and categorize important information from each interview. The interviews were not conducted under the agreement of anonymity, as the subjects of the interviews are public figures and thought leaders in the field of regenerative forestation whose thoughts and quotes should be attributed to them where appropriate and relevant. Due to their public role as leaders in their organizations, and the desire to have the research uplift their voices and their work, the interviews and data gathered were not anonymized, and some direct quotes are shared with attribution in the results sections. The interviews were not transcribed in entirety, but important select quotes were transcribed from each interview through listening to the audio recording. Secondary data, including interviews and writings of other notable tree planting leaders, who were inaccessible to be interviewed due to difficulty in making contact, lack of availability or interest in being interviewed, as well as from leaders who are deceased, were also considered alongside firsthand interview data, where relevant, in the results and discussion.

Results

Fourteen people were interviewed, from twelve organizations around the world. Three of the organizations work globally, the others included projects with the following geographic focus: Mexico, sovereign native land in the US, Kenya, California, Madagascar, Togean Islands (Indonesia), and Costa Rica. Thirteen interviewees were leaders of NGOs, two of whom also held roles as private consultants doing similar design and tree planting work, and one of whom also held a role as a funder, in a second job in which they are responsible for funding similar work. One interviewee was solely in a funder role, and has worked through a family foundation to set aside funds for tree planting work globally.

The information collected about tree planting leaders' motivation adds to the existing body of work about motivation in environmental volunteerism. Interviewees also described their organizations' ecological practices, as well as their insights on how they participate in building a movement. Furthermore, data about how leaders perceive their communications with the natural world were collected. The results present commonalities and themes in the data and highlight noteworthy elements from interviews. This section also brings in secondary source data from tree planting leaders who were not available for interviews when relevant. Results are organized below by topic: Ecological Practices, Building a Movement, Communication with the More than Human World.

Ecological Practices

The regenerative tree planting activities conducted by those who were interviewed for the purposes of this thesis are exemplary models of ecologically sound and socially responsible tree plantings. The ecological practices they use and the principles underlying their work are synthesized here.

Tree Nurseries

Tree nurseries were a common way that interviewees addressed the need of their projects to source quality trees and other plants. Tree nurseries both ensure quality and locally adapted stocks of trees, and increase the affordability of tree planting.

Jobs

Tree nurseries employ local people, often focusing on employment of local women. Tree planting leaders interviewed explained that they pay locals per tree planted and/or employ people to run the nurseries. One of the most famous and celebrated champions of tree planting in global history is Wangari Maathai who worked with rural women in her native Kenya through The Green Belt Movement. The organization taught women to run their own tree nurseries and paid them approximately \$0.04 for each tree grown, planted, and cared for. Over 51 million trees were planted and cared for in this way, establishing a model for distributed production of saplings that many organizations continue to use around the world today (Maathai, 2010).

Seed saving

Many of those interviewed practiced seed saving and choosing seeds from the best local varieties in order to refine tree genetics, so that saplings grown are more adapted for the local climate. Seed saving can also improve desired features such as taste and storability. Seed collecting is an affordable way to grow trees, and planting by seed increases genetic variation. Seed saving and planting is more suited for some trees than others -- it works well for most shade trees and for most tropical fruit trees, though other fruiting trees need to be grafted to bear reliably good quality fruit.

Propagation

Interviewees also spoke about taking cuttings from the fresh growth of trees for propagation. Propagating in these ways, clones the plant, which has its own benefits. Gerardo Ruiz Smith, who works primarily with mesquite trees in Mexico, mentioned that his organization saves

seeds but also uses a particular style of propagation called air layering. Air layering is a technique in which a branch that is still on the tree is wrapped with a soil medium and supported to grow roots. Once it roots, the section is cut off and planted as a new plant. Saplings grown in this way, like cuttings, are grown from mature wood and so will fruit more quickly than trees started by seed. Gerardo also talked about the importance of using specialty long tree pots in order to grow their mesquite trees with a straight deep tap root. If pots are not adequately sized, the roots can grow twisted which can result in a stunted tree and weaker tree when the sapling is planted. These special pots result in stronger root systems, which is always important, but is even more important for these mesquite trees which grow in dryland environments and must be able to survive periods of drought.

Another interviewee, David Milarch, works with his organization Archangel Ancient Tree Archive (AATA) to propagate champion trees, which are the largest and oldest trees of their species. Champion trees often live 2-3 times as long as the average tree in their species and grow to phenomenal sizes (Robbins, 2015). AATA has worked to catalog, preserve, and spread the exceptionally hardy, adaptable, fast-growing genetics of champion trees including the ancient redwoods in Northern California, where the ecosystem is rapidly changing which threatens their long term survival. As more than 95% of old growth redwoods have been already clearcut, AATA works with landowners and parks to find and propagate the few remaining oldest redwoods on earth. David has been interviewed around the world about the work of his organization which uses propagation from cuttings by climbing high into tree canopies to reach new growth and other techniques to clone and regrow saplings from the most exceptional genetic stock -- including even propagating from ancient stumps that were not considered viable.

Proper Post-Planting Care and Maintenance

Several interviewees including Paulino Damiano of Trees for Kenya expressed the sentiment “the trees are like babies”, speaking about the importance of care and maintenance of trees post-planting. Jenny from Association Community Carbon Trees (ACCT) said her organization

follows up for five years of care. Others also mentioned the importance of follow-up care, and expressed their frustration with many of the big planting institutions. Some of these organizations have reputations for planting trees to increase their overall figures but neglecting to provide adequate care and maintenance, resulting in poor survival rates.

Agroforestry

Agroforestry was the most widespread ecological practice mentioned by interviewees -- 13 out of 14 noted this strategy as an important part of their work. Agroforestry is the integration of trees into agricultural spaces and can be applied many different ways for different benefits. Interviewees spoke of planting trees to create windbreaks, add fertility to the land with nitrogen fixing trees, shade other crops, provide additional food and income for farmers, and support livestock with trees for fodder or shade in silvopasture design. Non-timber forest products were mentioned by many interviewees, as well as the importance of using trees that are well adapted to the local climate, are resilient in the face of climate change, and have cultural, economic and/or edible value.

In some cases, interviewees also spoke of including fast growing hardwood species to be harvested in areas where smallholders rely on wood as a building material and source of fuel, and/or income. However, as one interviewee stressed, the value of trees should not just be in cutting them down -- which can be a major problem in plantation style tree planting schemes. In agroforestry plantings, lumber trees may be included but must be part of a biodiverse design.

The interviewees who spoke about agroforestry all talked about examples of biodiverse agroforestry in their diverse ecosystems. For example, mesquite and agave planted in Northern Mexico drylands, mixed plantings of native trees along with avocados, mangoes, guavas, oranges and more in deforested areas in Kenya, fruit bearing trees and hardwoods planted on farms in Costa Rica, and biodiverse plantings including moringa and fruit bearing trees along with native trees in Madagascar.

Though each leader interviewed had different ways of implementing agroforestry, they stressed the importance of good design, choosing the right trees for the local climate and for the needs and wants of local people, the water management benefits of including trees on farms, and the economic benefits of agroforestry. Nine of the interviewees also mentioned their training in permaculture as a contributor to how they approach agroforestry design.

Earthworks and Water Management

Tree planting can be a tool for restoration and water management. The leaders interviewed who work on large-scale design described their use of earthworks to manage water flows, both to irrigate plantings as well as restore ecosystems and reverse soil loss. One interviewee also noted their use of GIS and drone mapping to survey the area and map the slopes, which facilitates their design work. However, designers and communities can also use laser levels or lower tech methods like an A-frame to survey and map the contour of the land (Feineigle, 2013).

Keyline system, a method of plowing lines along the contour of slopes to aid in water infiltration was used successfully by interviewees in their larger scale projects. Water infiltration through keyline plowing improves soil through creating the conditions for soil microbiology to thrive. Water infiltration also results in less soil erosion due to less water runoff. When water sinks into the soil it can be captured and taken up by trees and other vegetation that are planted or naturally occurring in the landscape.

Other earthworks that were successfully used for water management included use of swales, terracing, and “fish-scale pits” (Zheng et al., 2019), which were used and extensively documented by John Liu of Ecosystem Restoration Camps when he worked as a filmmaker at the restoration project on China’s Loess Plateau. Liu was interviewed about his work for this study. The Loess Plateau is, in John’s words, one of the “cradles of civilization” but resembled a “moonscape” at the turn of the 21st century due to centuries of mismanagement. This resulted in insecure conditions for 2.5 million people at risk of displacement. “Through local community

participation, earthworks for rain harvesting, natural regeneration, and agroforestry planting methods, desertified land in a region the size of France was restored to a fertile, productive, and ecologically diverse landscape within 10 years” (LIFT Economy, 2020). The Loess plateau restoration project serves to illustrate the enormous potential of large-scale ecosystem restoration, and led John Liu to continue this type of work in over 90 countries.

These methods have been implemented with success in a variety of ecosystems, including by Neal Spackman, who has demonstrated how to use earthworks for “greening the desert” through the Al Baydha project in Saudi Arabia. Spackman’s insights in interviews and classes that are available online echo that of several interviewees in this study, underscoring the feasibility, and efficiency of applying earthworks as a strategy for water management along with tree plantings (Spackman, 2015). Especially as experts warn that water shortages and periods of longer drought may be a result of climate change, and as we see increased soil loss, dust storms, mudslides, and other disasters, these techniques are important to conserve and regenerate soil and water systems.

Traditional and Cultural Practices

Traditional ways of stewarding land, and the legends, stories, and cultural wisdom of particular ecosystems are at risk of being forgotten, or have been at least partially lost. Interviewees cited colonization, enslavement, displacement, industrial agriculture policies, and the changing climate as direct causes. According to these leaders, the importance of remembering traditional ways, and integrating the old knowledge with scientific understanding is integral to restore their lands and their peoples’ connection to land.

For example, Wanda Stewart, who is a well-loved urban gardener and the Executive Director of Common Vision in Northern California, said her knowledge and skills with plants and ecological design have come naturally, and “absolutely the ancestors spur me forward”. Through her gardening and tree planting work, Wanda centers African American healing in connection to land. She spoke about reclaiming agriculture as a form of ancestral knowledge and a way to

access “the excellence that comes with eating good food and the power to feed your children well ... working hard with your physical body, and essential relationships with your community, and a spiritual connection to the land.” She conducts her tree planting work with students and community members to restore relationships with the earth, and to lineages of earth stewardship.

James Calabaza, who directs Trees Water People’s work with indigenous communities in the United States, also shared about the value and importance of integrating indigenous wisdom and practices in reforestation and agroforestry. James supports farmers and community members in South Dakota, and New Mexico on tribal lands that are naturally drylands, as well as in wetland and riparian areas. Their NGO works with local agencies and tribal communities to restore land through tree planting, natural regeneration, and rotational grazing, and they work to reintroduce fruit bearing trees like chokeberries and other culturally important trees. They integrate cultural connection with choice of plants, use of traditional prayer, and intergenerational events to share and learn more from elders about their native ways. They stress the importance of having local people taking an active role in management of the projects.

Gerardo Ruiz Smith, is also uncovering cultural and historic ecological knowledge in his work with the mesquite tree. Gerardo shared that though he was born and raised in northern Mexico around plentiful mesquite trees, he had never eaten it or known of the nutritional or ecological value, or the historical relationship of Mexican people and the mesquite tree. It wasn’t until he came to California to study permaculture that he learned more about mesquite and tried it for himself. He returned to Mexico and continued to learn about the cultural history of the important tree. In his own words,

... the mystery of indigenous peoples using mesquite for thousands of years, even before the domestication of corn... it was the most important staple crop for most of the hunter gatherer cultures of most of north and central Mexico for a few thousand years, and it was by far the

most important crop. ... so the whole knowledge of mesquite as a food crop basically got erased, with a few exceptions - there are a few indigenous communities in Sonora, Baja California, and Arizona who are still keeping the knowledge and tradition and they still harvest and process the mesquite once a year. But other than that it got totally forgotten basically, so here in Mexico, most people who live in mesquite territory - they have no idea about the edible potential of mesquite, which is insane in my opinion. Being such a delicious and nutritious (tree), and having all this amazing cultural history, and being one of the most resilient trees for drought, heat, poor soils, climate change ready, nitrogen fixing, fire proof - it's just an incredibly resilient and hardy, adaptable (tree)... it's also an amazing fodder for animals and it's also the source of the best bee honey in the world.

Gerardo works with local farmers, other NGOs, and local government as a consultant and designer and educates others about the wonders of mesquite. He runs a large mesquite nursery that is cultivating unique varieties of mesquite. He is founder of the Mesquite Institute which is reviving the local taste for mesquite through education, festivals, cultivation, planting, and harvesting, milling and selling the plentiful mesquite that already grows in the area.

Urban Forestry

Urban forestry was the primary form of tree planting for five of the interviewees, and an area of interest for one of the interviewees who works on funding projects. These interviewees were all based in the United States and came from three organizations. Urban settings have their own ecological concerns and opportunities. One interviewee cited urban heat island effect, while others spoke more about food justice and the intersecting areas of health, access, and poverty that impact the urban forest. Some of the ecological practices mentioned included species and site selection, and proper site preparation, which sometimes included removal of asphalt, and restoration of degraded soils. Organizations growing food in urban areas also had to think about toxics in the soil and address this challenge to ensure the safety of food grown. All the groups interviewed use organic practices in planting, though not all the trees sourced were grown organically. The groups interviewed sourced trees from their own nurseries, partner groups, and also from commercial nurseries. They planted native trees, fruiting trees, and trees

with cultural significance. The interviewees stressed the importance of their work as educational, and as a way to share ecological connection with city dwellers.

Composting and Mulch

Soil building, and specifically composting and mulch are important practices for regenerative forestation. Composting helps cycle nutrients back into the system and improves soil quality and nutrition. Mulch helps retain water, build microbial life, and protects from soil erosion. Stephanie Garvin, a director of a new NGO in the remote Togean Islands was trained at another well known and established tree planting organization, Sadhana Forest in India. Stephanie is working with local small communities to restore areas of land that have been severely damaged by deforestation and slash and burn agriculture. Stephanie talked about the common culture amongst farmers that the farm should look neat, and that the use of mulch was often perceived as untidy. People would burn plant waste and material rather than use it for mulch or compost. When her NGO, the Togean Conservation Foundation, planned to do tree plantings, they offered composting training as an incentive for tree planting volunteers. Through the training, people learned more about the usefulness and technical aspects of composting.

Other interviewees also spoke of the importance of composting for soil and tree health. Jennifer Leigh Smith, director of ACCT in Costa Rica, coordinates a women's group that does composting, to produce compost for their tree nursery. Michael Flynn from Common Vision, who plants fruit trees at California schools said they teach about "tending soil with compost, mulching, mycorrhizal inoculants, teach about soil microbiology, soil as carbon sink".

Focus on Equatorial Regions

Jennifer Leigh Smith stressed the importance of focusing reforestation on equatorial regions. Reforestation in this region is especially important for carbon sequestration, as trees and other vegetation grow faster here. Though this was only mentioned by one interviewee, it is also discussed by scientists, who indicate the importance of tropical rainforests for cloud formation and the earth's water system (Cayet-Boisrobert, 2014). Other tree planting groups like

WeForest and another notable tree planting leader, Clare Dubois the founder of Tree Sisters, also discuss the importance of focusing tree planting and reforestation efforts in the tropics for carbon capture, biodiversity, and rain and climate effects (Cayet-Boisrobert, 2014; WeForest, 2018).

Natural Regeneration

Natural Regeneration is the use of minimal interventions to allow forests to regrow naturally. In some cases, it can be more effective than tree planting, and is less costly. Minimal interventions could include fences to prevent animals from grazing an area to give saplings a chance to get established, or weeding around sprouting trees.

Interviewees mentioned the importance of using natural regeneration as a strategy when possible. However, the success of natural regeneration depends on many factors.

Considerations include the proximity of intact forest (so that seeds can spread naturally by wildlife), the level of degradation of the land to be restored, and viability of remaining vegetation.

James from Trees Water People talked about using natural regeneration methods in their projects working with communities on native lands in the US. They have also started to use a technique called applied nucleation, sometimes known as “tree islands”, in which small areas of trees are planted, and the forest is allowed to spread outward from those areas through natural processes.

Farmer Managed Natural Regeneration

The field of Farmer Managed Natural Regeneration (FMNR) has been greatly successful with notable examples in Burkina Faso, Niger, and Ethiopia, among others (Hawken, 2017; Birch et al., 2016). FMNR is an approach that uses natural regeneration principles as described above, and is spread farmer-to-farmer, often through word of mouth and through local communities.

Muvuca

Another method called Muvuca, that is used in Brazil, could be considered a hybrid of natural regeneration and tree planting, and involves sowing the seeds of trees and other plants that grow around them directly to large areas of forest (Ribeiro, 2019). This technique uses a lot more seeds, but is cheaper than growing tree nurseries. It allows trees and plants to establish themselves in a more natural layout, and trees do not have to recover from the shock of transplanting. It is only suitable in certain climates and at certain times of year, as seeds sown need consistent rainfall to germinate and establish.

Mangrove restoration

Mangroves are trees and shrubs that live in the intertidal coastal zones in the tropics and are uniquely well adapted to the brackish water. They are able to filter salt water and grow in the tidal zones due to their impressive roots which allow them to stabilize themselves, protect the coastline from storms and tsunamis, while providing essential habitat for fish and sea life.

“Mangrove forests are among the most productive ecosystems on earth, and serve many important functions, including water filtration, prevention of coastal erosion, coastal protection from storms, carbon storage, food, timber, and livelihood provision, and biodiversity protection, among others” (Global Mangrove Alliance, n.d.).

As mangroves are threatened by clearing for agriculture, shrimp production, and other uses, their loss threatens coastal communities and fisheries. As they are a unique ecosystem, government foresters are generally not knowledgeable about how to restore damaged mangroves and many mangrove planting efforts fail. Community based ecological mangrove restoration (CBEMR) is an approach that involves local community and traditional knowledge to facilitate mangrove restoration, and uses natural restoration (Wodehouse et al., 2020).

Stephanie, interviewed for this study, who works in the Indonesian Togean islands, Josoah who works in Madagascar, and Lendri and John who work around the world all mentioned the importance of mangroves.

Principles

In addition to the practices listed above, interviewees also commonly spoke about a set of principles that guides their ecological approach. See Table 1 below for a synthesized set of principles and examples of applications that interviewees identified as important to their work.

Table 1. Ecological Principles and Applications in Regenerative Forestation

Principle	Concept	Examples of Applications
Biodiversity	Diversity of species, varieties, animals, plants, living in close proximity, in a web of relationships with one another.	Interplanting; agroforestry; rare varieties and native species being valued, saved, and planted/cultivated
Reciprocity	Give back what you take, aim to give back more than you take	Compost to cycle nutrients; plant trees for all trees that have been removed; provide fair pay for people's work; plant enough for animals and wildlife too
Feedback	Changes made can amplify and build on themselves	Swales and earthworks → increased vegetation → increased rain → improved soil, increased vegetation → more rain = reversing desertification.
Observation	Sensing, paying attention, and understanding a place over time	Designing for microclimate and site-specific factors
Biomimicry	Design systems and interventions based on design of natural systems	Planning for succession, utilizing interplanting; planting native species; "increased biodiversity, biomass and accumulated organic matter" - John Liu

Movement Building

Leaders interviewed collectively mobilized tens of thousands of people and planted hundreds of thousands of trees through their organizations. Common and notable themes about their motivation and approaches to movement building include:

Motivations

Interviewees had varied motivations, but all saw their work as a part of addressing environmental and social problems that they experienced in their communities, families, or in other places they felt connected to around the world. Many referred to their work as “a life mission” using phrases such as “I was called” or “It was kind of beyond me, it felt like a calling and very easy choice.” When speaking about their roles within regenerative forestation efforts, they expressed notions of decentralized growth -- “it’s not my organization, it’s a movement that belongs to the members”, and indicated that they understood their work as a part of a larger movement -- “(the organization) does not feel like it’s ours in any way.”

Several interviewees had full-fledged careers including as a successful journalist, as a lawyer, as a climate data analyst, a labor organizer, or an artist, before they decided to pursue this line of work. Others had spent the majority of their work life in the ecological field, some starting as teenagers, working or volunteering for other tree planting organizations before starting their own programs. Some mentioned synchronicities or coincidental encounters, and even what could be considered “psi phenomena” leading them to their path (see section on messages from the more than human world below). Interviewees commonly talked about their love for the natural world, the primacy of the natural world, the purpose they find in doing this line of work, and the urgency of rising to the occasion to do what John Liu refers to as the “the Great Work of our time” (Liu, 2015).

Partnerships to build the movement

All the interviewees talked about the importance of collaboration between groups in their work. Organizations formed partnerships with other groups to bring in skills, resources, training, networks, or legitimacy. They spoke of collaborations with their local forest service, other similar NGOs in their area and abroad, local government, and tribal leadership. Groups would create partnerships to fill in gaps in their own capacity to fulfill their intended mission. Partnerships are essential for organizations to accomplish their goals and to build a strong movement.

For example, Kyle Lemle and brontë verez, co-directors of the NGO Lead to Life, run events where they ceremonially melt guns into shovels to plant trees. In their words “We are a collective centering queer, and black leaders, healers, dreamers, ecologists, working to transform that which ends life into that which sustains life”. As their work is at the intersection of participatory performance art, liberation theology, and spiritual ecology, they partner with a wide swath of groups including programs that work on violence prevention, as well as urban forestry groups, permaculturists, local artists, and ceremonialists. They work directly with mothers who have lost children to gun violence, as well as liaise with city officials to get permits as needed, and build relationships with small donors as well as large philanthropic funders. In Kyle’s words “We can’t do the work without partners. The whole magic of the work is bringing people together - from cooks... meeting farmers, meeting metalsmiths, gun buyback nonprofits, meeting (with) the King Center, Dr. King’s family, and on and on ... We weave people.”

Decentralized Media

Several interviewees were very skilled storytellers and had created media to share their work more broadly. John Liu was a filmmaker and journalist before he got involved in ecosystem restoration work and has continued to make films to share his work. There are 49 films listed on his Academia page, and high numbers of views on his YouTube videos including 1.6 million

views on a 2012 documentary about his work in Jordan (Liu, 2017). Kyle, and brontë from Lead to Life had also reached 323K views on videos about their work, and have been interviewed and written up in large platforms including the New York Times, HuffPost, and Upworthy among others. Their story was shared by supporters with large followings including Congressperson Barbara Lee, and on a popular ecojustice podcast For the Wild (Lead to Life, n.d.). David Milarch, and his organization Archangel Ancient Tree Archive also increased his reach through media coverage of his work. In a book written about his work, he recounts how some big news and magazine features led to future partnerships, new funders, and new opportunities (Robbins, 2015). All these groups used media to share unique and compelling narratives to captivate people's imaginations, inspire, and invite participation.

Though many hundreds of thousands of people may be inspired or temporarily engaged by a viral video, one founder warned about "clicktivism," reminding us that it is more meaningful for people to engage with tree planting tangibly, not just through "liking" or sharing a video. A few interviewees talked about their struggle to represent themselves well and gain traction through social media and the frustration of seeing global media campaigns for a few dominant major tree planting organizations take off, while their small on-the-ground work was vastly underfunded. This is especially discouraging when the big organizations in question do not have good relationships with local communities and there is a lack of trust.

Alternatively, Stephanie's work in the Togeian Islands is often shared via word of mouth, which travels through both tribal affiliations and geographic proximity of villages. Internet access is also disparate between regions and can be unreliable or unavailable in remote locations, which can affect peoples' ability to share and create media about their work.

Centering Marginalized Communities

Indigenous communities

The international community is in agreement that indigenous people are the best stewards of forests, and that indigenous stewardship is as effective or more effective than government protections at conserving forests and protecting biodiversity (Tauli-Corpuz et al., 2018).

One interviewee warned about the paternalistic dynamics present in some conservation and tree planting programs and how this can backfire by creating a bad relationship with the local people. She explained that after an area was put in a conservation zone by a large conservation organization, without local participation, it resulted in people intentionally going there to deforest and kill wildlife. She warned, “local people and indigenous people don’t deforest (their own land). Pissed off people deforest”.

Racial Justice Lens

All of the interviewees based in the United States, as well as some elsewhere, spoke about the intersections of environmental justice and the importance of a racial equity lens to the success and integrity of their work. One such leader, Michael Flynn, former director of Common Vision, who has worked on fruit tree planting in California schools for 20 years, named “the honing of the racial equity lens as a major outcome for an organization that was historically mostly comprised of white folks”.

Women and Queer People in the Movement

Five of the interviewees were women or non-binary people. They and many of the men interviewed discussed the importance of including women and other marginalized groups meaningfully in tree planting. As women have been excluded from leadership roles and public life all around the world, it can be more effective to create women’s groups as part of tree planting organizations to ensure a space for their full participation. Five of the people interviewed mentioned having women’s or queer/nonbinary groups within their organizations to magnify the voices and leadership of women and other marginalized gender identities.

Clare Dubois, the founder of Tree Sisters, who was not interviewed for this study but is a leading figure in tree planting globally, has developed an organization in which women in

Westernized countries form groups to uplift one another and collectively donate to support reforestation work in the tropics. In a video online sharing the impetus and foundation for her work she shared “You have to mobilize the women. Women are the missing piece Women are naturally oriented to bring any system into health and wellbeing The history of what’s happened to women in our subjugation and controlling and dismissal and devaluing ... is so similar to how nature has been treated, that women deeply understand what's happened to nature” (Dubois, 2016).

Of course, Wangari Maathai is also famous for the intersectional approach her organization The Green Belt Movement took, linking women’s empowerment, ecological restoration through tree planting, and budding democratic efforts in Kenya. Wangari Maathai faced many obstacles and difficulties as she became a national figure for her work -- her womanhood was ridiculed and called into question since she was not being silent and passive. Nevertheless, she prevailed and succeeded in working with hundreds of thousands of rural women to reforest large areas of Kenya. She later received the Nobel Peace Prize and international recognition for her contributions to the field of restoration and as a pioneer of community-led tree plantings (Maathai, 2010).

In discussing the importance of women in the movement, it is an opportunity to also recognize that queer people and those who do not fit in the gender binary are also marginalized and excluded from full participation in parts of society. Two interviewees spoke about their queer identity and how they bring an awareness of “queer ecology” to their work. Queer ecology is a body of work that connects biology and queer theory, illuminating that “Life-forms themselves undermine distinctions between Natural and non-Natural” (Morton, 2010). A queer perspective defies rigid categorization, and is a reflection of the multiplicity, changeability, and diversity of expression and relationship inherent in the natural world.

Funding the Movement

One of the interviewees, Lendri Purcell, shared her perspective as the initiator of a multi-million dollar fund to support regenerative tree planting work. Lendri worked with her grandfather's family foundation, Jonas Philanthropies to create a new program area of work focused on trees. As a part of their work, Lendri brought in a new economics and social change firm called LIFT Economy to build a directory of more regenerative planting projects around the world. They also created a document to share the principles of Right Tree, Right Place, Right Community, (LIFT Economy, 2020) to educate other funders on the value and potential pitfalls of funding large-scale tree planting and conservation work. As of June 2020, they are working to gather funding from other foundations with a goal of raising 10 million for these projects. Lendri talked about the importance of trees as a legacy, to those who are looking for a meaningful way to contribute to the world, especially near the end of their lives. She sees large potential in creating dedicated groves, which can be sponsored or dedicated in the name of loved ones, as well as in educating foundations that work in the areas of health, poverty alleviation, or environment about the many interconnected benefits of trees.

Other interviewees, who worked primarily with NGOs, talked about creating income generating flows, so as not to be solely dependent on grant funding. Gerardo works as a designer and consultant with farmers to support agroforestry and key line design. His organization also has mesquite powder they sell, and a tree nursery they sell from. Josoah sells Moringa trees to other local and international tree planting efforts through his organization Tinone Association. Jenny from ACCT in Costa Rica works as a paid designer for farmers and international projects, as well as a carbon auditor. Kyle and brontë, shortly after our interviews, did a round of online fundraising and raised \$30,000 in just a few days from a few social media posts. John Liu talked about Ecosystem Restoration Camps' use of a membership model, where members pay a monthly donation of their choice, to support the work of the organization. Grey, co-director at Growing Together in California, takes another approach and works another part time job to do

similar and related work, doing garden curriculum design and funding through Numi Foundation.

The struggle to fund the movement persists, though enormous amounts of money are being moved in the name of tree planting and conservation. Lendri shared about the TeamTrees campaign, which was a viral YouTube campaign led and supported by YouTube stars who wanted to do something positive with their social media clout. In just about 2 months they raised \$22 million dollars from small donors as well as major gifts from celebrities and the wealthy (Team Trees, n.d.). However, they have been critiqued after the fundraiser, when the entire sum of money raised was given to a major tree planting organization, Arbor Day Foundation, to plant trees at \$1 per tree. Tree survival rates have been called into question, though Arbor Day has responded saying all trees will receive follow-up maintenance and care, and that there will be accountability for ongoing care of the 22 million trees through their planting partners (Calma, 2019). However, giving all the funds to a centralized agency limits the benefits that these resources could have, were they directed to community-based organizations.

Lendri is trying to educate funders that creating meaningful jobs is one potential benefit of tree planting that should not be neglected in the rush to plant trees. When funding is put towards tree planting, it should be directed to frontline communities, the ones that suffer the most as a result of the extractive economy and who face the first and worst impacts of climate change (LIFT Economy, 2020).

Several leaders interviewed talked about the economic, neocolonial, industrial conditions that impact and influence their work. Just in the last decade, the ecology and sustainable economy of the Togean Islands has rapidly been destroyed. The arrival of Chinese industrialists brought predatory loans for motorboats. The loans require fisherpeople to use newly introduced industrial methods of explosives and other destructive fishing practices to meet their quotas, which has destroyed reefs and severely depleted the fisheries. This case is unfortunately similar

to stories from all over the world of environmental exploitation in the name of development, leading to worsening poverty. Many farmers' current methods are not sustainable because governments around the world pushed the last generation of farmers to use chemical fertilizers and pesticides, and to deforest and plant foreign crops, such as in India (Mies & Shiva, 1993), and Kenya (Maathai, 2010).

In response to climate crisis, governments, intergovernmental agencies, and the private sector have created carbon markets to value carbon sequestration and charge polluters and industry. Carbon markets, and ecosystem service valuation is an attempt to use existing economic structures and mindsets to value and protect nature. The potential and critique of carbon markets deserve their own full analysis. Those interviewed within the scope of this study expressed doubt and frustrations about the use of carbon markets and similar mechanisms to create systemic change. However, some thought they may play a temporary role in a Just Transition framework (Movement Generation, 2016).

John Liu, a board member of Ecosystem Restoration Camps, shared that the organization is in conversations with a global team of partners to create their own currency, one based on restoration and natural value inherent in living intact ecosystems. In an essay he writes "We need to see that the false value we have attached to extraction, production and consumption has devalued natural Earth systems, which are in fact the very source of all life and wealth" (Liu, 2015); or as Vandana Shiva, leader in the movement for food and ecojustice said "Nature shrinks as capital grows. The growth of the market cannot solve the very crisis it creates" (Mies & Shiva, 1993). Tree planting leaders warn of trying to solve the world's problems with top-down financial approaches, and simultaneously, stress the importance of ensuring local people are properly compensated in their tree planting and growing work which has environmental benefits for the entire world.

Sharing Knowledge: Education and Trainings

Josoah Monja has been doing this work for 20 years in Madagascar. He used to do tree planting with his father, and now loves to work with youth to teach technical skills, and teach them all about trees. He works with many schools in his area to share educational programming and plant trees, and estimates about 3,000 youth have participated in planting trees with him. His passion to get youth involved in this work is clear “Everyone should participate to plant trees in the world. My vision is that every person plant at least 10 trees in their community - and life will be paradise”. He also partners with Peace Corps and other local groups to run trainings and workshops.

Other interviewees also focused on education and tree planting in schools. Grey Kolevzon, who works in California schools with Growing Together, supports students to learn about their food system and experience nature in their own community. He used to take kids on bike rides around their city, stopping at local creeks, bays, and the ocean, to see and understand their watershed. He worked as an educator for years, and used to be the Oakland Unified School District Gardens Coordinator, before becoming director of Growing Together. Wanda and Michael from Common Vision also focus on planting in schools. Jenny from ACCT runs a youth program and has youth ambassadors.

Ecosystem Restoration Camps also uses education as a tool to grow the movement. Their organization hosts camps all over the world, where volunteers come for a week or several weeks in which they camp on the land, work on restoration projects, and participate in trainings and educational workshops. Ecosystem Restoration Camps’ John Liu, and others of his contemporaries like Neal Spackman, mentioned earlier for his regreening the desert work, and Clare Dubois (Tree Sisters), share a lot of resources online in the form of articles, and videos, and webinars about how to get involved in the movement. There are many free and paid educational offerings being made available online by these tree planting leaders and their organizations, for those who can access them.

There are specific challenges to education in more remote regions. For example, Stephanie, who works in the Togean Islands, shared that education has to be available in many languages with the support of translators to reach the various groups of people on the islands. Written education materials or signs have to make use of graphic explanations as illiteracy is also common. Since people on the islands traditionally relied on seafood and fisheries are depleted, they do not have as much knowledge of sustainable farming. Additionally, Bajau people who now live on the islands are not traditionally agricultural people - they are traditionally nomadic sea people who were made to settle as part of national policy. There is a need for accessible education about the basics of ecological agriculture that has to be adapted for each of these specific communities' needs.

Relationship with the More-than-Human World

The phrase “more-than-human world” was coined and popularized by author, ecologist, and performance artist David Abram. Abram speaks of the “animate earth” and focuses on the use of language and sense of communication with the natural world in many diverse traditions of earth-based peoples, bringing attention to themes of oral history, story, being part of a collective, relationality, and local knowledge (Abram, 2017). The research inquiry about communication with the more-than-human world was informed by Gaia theory, the field of deep ecology, and the researchers' own experiences.

Communication from the More-than-Human-World

Although motivations were discussed earlier to some extent, a further report of motivations shared that are related to the interviewees' sense of communication from the more than human world are included here. These experiences described by interviewees could be categorized as paranormal, or “Psi phenomena” (Radin, 2014) as they touch on the unseen, or the spiritual, and are often experiences that do not fit into a materialistic or rational paradigm. As this study seeks to understand leaders' experiences from their own perspectives, the

researcher sought to listen openly to these experiences, in order to increase understanding of lesser known or talked about parts of peoples' motivations to participate in environmental activism.

Near Death Experience

One of the most remarkable stories of how an interviewee came to their work was that of David Milarch. In his words:

Yea I died. In a hospital. Total renal failure - that's when your liver and kidneys quit... that night I did die, I crossed over to the tunnel of light.... When I was over there, they told me I had work to do and I had to go back. And so when I came back, I couldn't walk, my legs didn't work... my feet were turning black, so I had to keep them in buckets of ice water in and out around the clock for the pain. And that's when the angels came and said you need to get up and go to the living room and grab a yellow pad, and I did, and then when I woke up the outline for the project was on that pad ... and that's the truth.

David also referred to the angels at other points, as beings of light. He said that after that experience he was very clear what we needed to do, and followed this guidance to create Archangel Ancient Tree Archive against many odds. More details about this experience and the events it set off can also be found in the book, *The Man Who Planted Trees* by Jim Robbins. Robbins, is a New York Times journalist who subjected Mr. Milarch's story to scrutiny over the course of years, and looked into the existing science about Near Death Experiences (NDEs). Robbins concluded that Mr. Milarch's story is true and in line with what others who have NDEs describe (2015).

As AATA developed they were able to do groundbreaking work in the field of propagation. Mr. Milarch talked about his lack of higher education, and that many scientists and academics warned him that cloning ancient trees wouldn't be possible because of their age. However, AATA has shown that it is possible and has sent hundreds of thousands of saplings from champion trees to planting projects around the world. Furthermore, Mr. Milarch shared how this experience changed him, deeply and profoundly. Not only was he given his life work, he

found himself able to be more loving and compassionate, more clearheaded and perceptive than ever before.

This story echoes elements of Clare Dubois' story as well. Clare's work with Tree Sisters was presented earlier in regards to women in the movement. Though she was not interviewed for the scope of this study, she has shared the deeper story about how her work was initiated in videos online. Clare had a severe car accident in which she crashed into a tree. At the time of the incident she saw a "Blinding flash of light in the car. Inside the light was two words 'The Experiment'" and she heard a voice telling her "you have to reforest the tropics in 10 years" and was given detailed instructions for how to do so, centered around women (Dubois, 2016). Clare shared that after this experience it took another year or so for her to decide to listen to the message, and that doing so created enormous changes in her personality and life; she went from a shy and hesitant person to a more embodied, powerful leader with a clear purpose. Tree Sisters has so far planted over 11.5 million trees with planting partners in the tropics.

Visionary Dreams

John Liu was involved in restoration projects around the globe. He started having a recurring dream in which he saw people camping on land, working together on restoration, sharing food, and taking part in workshops and trainings. After several recurrences of this dream, he wrote about it on his social media and was very surprised with the response he got -- many people responded saying they were envisioning the same things. The massive support his post received led him to think about the idea more seriously, and in 2017 Ecosystem Restoration Camps hosted their first camp in Spain. Now they have 21 camps all around the world and are in a moment of expansion as word about their work gets out. The interview with John was conducted at a new restoration camp near Mount Shasta in Northern California, and there are many more sites that are in process to become officially registered as restoration camps. John's dream could be seen as a prophetic dream, or a collective dream that is now becoming a reality.

brontë velen also shared about the role of vision and prophetic practice, and a body of work they have been exploring called “kinetic fiction”. They explained “how can you write a fictional piece that informs your organizing? How does immersing yourself in prophetic practice start to instigate other ideas about how you approach organizing work? And from there, form the dream, work backwards.” brontë cites the black prophetic tradition as a lineage in which they understand their tree planting work. They shared how their current work was imagined into being through the use of kinetic fiction in their undergraduate thesis work. It was a combination of academic and creative writing that envisioned a group of people doing healing tree planting work in the wake of climate disaster and state oppression -- similar to what they now do with collective members and the public through their organization Lead to Life.

Mushrooms and Plant Medicine

Three people interviewed said that their experiences with entheogenic mushrooms and other psychedelics helped them form and clarify their vision for their work, build a sense of relationship with the plant world, and receive directions for their work. One interviewee, Gerardo Ruiz Smith, talked about participating in traditional medicine ceremonies with the Huichol people and how life changing and clarifying those experiences with sacred cacti and mushrooms have been in designing and implementing the work of his organization. (Note: a few words were spoken in Spanish such as “y”, “ceremonias”, and have been transcribed as spoken.)

Most of the ceremonias experiences that I have there is always information just being downloaded about what we have to do - me and the mesquite - to make this vision a reality... such a direct connection, feeling of there [being] no doubt about what's my mission in this life... my alliance with mesquite, such a fundamental aspect of my whole existence, and this beautiful clarity ...and it's not just me giving or being of service for the mesquite, but it's very interesting how this “obsession” with one single tree has created or opened up such amazing opportunities in my life and my work ... it's just been a very impressive force for everything I do. So we have a beautiful alliance, and collaboration, and we take care of each other. And every psychedelic experience, it's always the same beautiful, actual, real vision of huge expanses of land being all

regenerated and full of these beautiful agroforestry systems, and water and soil healthy, y people happy and well fed and nourished.

The experiences Gerardo describes in the quote above, have been supported by researchers, including those at John Hopkins Center for Psychedelic and Consciousness Research. For example, their 2006 and 2008 studies showed that “Psilocybin led to profound experiences that 67% of participants rated as among the top 5 most meaningful experiences of their lifetime.” (John Hopkins Center for Psychedelic and Consciousness Research, n.d.), and that “psilocybin occasioned experiences similar to spontaneously occurring mystical experiences” (Griffiths et al., 2006). Additionally, two other interviewees referred to experiences with psilocybin when speaking about the ways they attune to and connect with the natural world.

Synchronicities

Synchronicities are “coincidence(s) without causation, as commonly understood, yet having meaning to those involved” (Cambray, 2009). The phenomenon of synchronicity was studied and described by Carl Jung, and many others after him. Jung noted “As a psychiatrist and psychotherapist, I have often come up against the phenomena in question (synchronicity), and ... how much these inner experiences meant to my patients. In most cases they were things that people do not talk about for fear of exposing themselves to thoughtless ridicule” (Jung, 2010).

Stephanie, Jenny, Wanda, and brontë shared synchronistic events -- seemingly random or coincidental occurrences -- that had meaning for them and led them to start or go deeper into their field of work. For example, Stephanie missed her boat to a tourist destination in Indonesia, embarking instead on a trip to the only place for which there was still tickets -- the Togean Islands, a remote and non-tourist location; Wanda was mistaken for another person who she later befriended and began a long working relationship in urban gardening.; Jenny helped an injured person while on a short trip in Costa Rica, which led her to meet with others working on sustainability and was offered a job, then deciding to leave her current job as a

lawyer and move to Costa Rica; brontë shared that recurring images and experiences with plants, birds, and particular trees took on meaning, connected to lost loved ones, and supported them to trust their vision in developing their ceremonial tree planting work.

Non-Linear Ways of Knowing

Interviewees shared insight into the non-linear ways of knowing they engage with in relationship to their work and in connection with the natural world. Scholars of traditional ecological knowledge (TEK) have articulated that TEK does not only refer to the content of the knowledge (i.e. uses of plants, forest management systems, habitat of endogenous species) but also the process of how that knowledge is created, i.e. a dynamic process in collaboration with the more than human world (Groenfeldt, 2003). Interviewees were asked to share the different ways they sense information or communication from the natural world. Though all responded that they do sense information from the more than human world, many paused, and took moments to think on and articulate what that question meant for them. To respect the interviewees' answers, which all had their own nuances, data from answers to this question are represented in their own words with select anonymized quotes to illustrate the general themes identified: Listening, Intuition, and Direct Relationship. It should be noted that while these categorizations are used as an effort to catalog the information shared, these categories are not necessarily distinct and often have overlaps.

Table 2. Methods of Perceiving Information from the More-than-Human World: In their own words

Method of Perceiving	Selected Quotes
Listening <ul style="list-style-type: none"> • Quieting the mind • Slowing down • Observing with care, intention, attention 	<p>"I don't feel like I have conversations with plants, but it's more like a quieting, and a merging that can happen with the land... that's where all the wisdom resides, and truth. And trees, they operate at a slower frequency. That's why they live so long, they're moving so much slower than us... we can't hear it but they're talking to each other and sharing information with each other through sound."</p> <p>"To slow down the mind and listen at the pace of a tree - I want to learn how to do that. ... [I] don't claim to have that kind of relationship, but I know that it's possible based on a few experiences I've had"</p>

	<p>“It will come through you as weather, and it comes out as thoughts - once it comes into your mind, then you start thinking to yourself, you start talking to yourself, or singing, then you’re like, oh yea this is what the world’s telling me... visions of what’s going to happen, or ways of seeing things that have already happened, some of it is sort of subverbal... but more than often it’s song. I really think that song is the key.”</p> <p>“Allowing the landscape to speak for itself.... Try to identify and understand how the landscape is... how is that landscape trying to express itself – what’s the ultimate climax for that landscape, is it trying to be a forest, a grassland, how is it trying to express itself?”</p> <p>“I definitely listen for signs and patterns. I feel like pattern recognition is really important to my work, both in the waking and in the dreaming. Noticing what plants or what beings I come across in certain moments, when ...I’m seeking clarity... when I would like spiritual orientation or guidance. I definitely feel like when you’re attuned to the more than human world, they support you (laughs)! I definitely feel supported.... I listen to plant and especially bird signs for sure.”</p>
<p>Intuition</p> <ul style="list-style-type: none"> ● Knowledge from a deep part of the self ● Accessing inner and ancestral knowing 	<p>“I’m always looking for signals. So when I make a decision it’s based on the piling up of paying attention to signals - hhm how long had it been? Wow it crossed my mind, oh it crossed my mind again, let me listen, it’s very true.”</p> <p>“So taking cues, really observing and looking around, and trying to get a sense. And using your intuition as well. You know we’re taught to switch off our intuition and listen to experts but I think also within us all there’s an intuitive sense, and I think the more time you spend in wild remote areas (it develops).... “</p> <p>“As a busy mom with so many things, I don’t take a ton of time to be quiet in nature. ... my goal is to have more of that in my life... It’s more like I feel like I can communicate <i>with myself</i> better when I’m in nature, particularly amongst trees.”</p> <p>“Gift of long vision It’s like a confidence, a knowing. It’s only recently that I would have expressed it to you in that way.”</p> <p>“Prophetic imagining ... it’s very deep for me to trust that you can work across time.”</p> <p>“...I have skills and I don’t know where I got them from. You know (gestures to home garden), this is not even the result of being a master gardener... so you know it has certainly come naturally, and when things come naturally like that we say that’s where they come from (the ancestors).”</p> <p>“I’ll spend 17-18 hours researching, looking for ideas. And sometimes one just pops... I’m a great believer if I can’t find the solution, just to pass the question</p>

	<p>over to my brain. And I believe that then when we step away from that, your brain can go looking for the idea without you having to be consciously thinking about it. Those are the kinds of answers that just pop up when you're just about to fall asleep. Your brain starts to relax, the answers start to come. So I keep a notebook in my phone... when I'm about to fall asleep I can easily pick up my phone and make a little note when it's something I have to remember. I think that's another good way of employing the subconscious to work on stuff."</p>
<p>Direct Relationship</p> <ul style="list-style-type: none"> • Instructions from the more than human world • Characterized by clarity of connection and message 	<p>"I feel like it's kind of directly from the places itself ... it comes in times - like the end or beginning of the day, like if I go somewhere really special Songs too are part of it, like I'll feel myself hearing songs or like singing songs, making songs up, that's like part of it too. Or like water, I'm really attracted to water especially, and almost all these places have some water component that's really evident, you know? But if not, I'll just look at the clouds or whatever.... (it's important) the way I go to the places ... it doesn't work if I drive there, I have to like walk there or bike there, or take the train."</p> <p>"Sometimes I hear the actual instructions like what's the next step, what are the next tasks that need to be done, or who do I have to talk with or what do I have to start doing or putting more attention towards and that's basically all the messages I get when I take mushrooms or peyote or anything, which is quite interesting,</p> <p>"We would do things together, the angels and I, about the project."</p> <p>"I don't know if this is okay to say because it's about mushrooms... (Interviewer confirms, yes). I had a very deep connection with the crepe myrtle tree, to the point that whenever I encounter a crepe myrtle I can't unsee what I felt when I saw them with the mushrooms - where I could really see their energy and feel their spirit."</p> <p>"I started having these dreams about people camping but I rejected the dreams, thinking well I'm not really ambitious enough to try to convince everybody on the earth to restore the earth, and they won't listen to me ... I didn't believe in it, I didn't believe in people, I didn't have enough faith But when I kept having dreams, I started to write about it, and all these people said well I'm having that dream too, then I realized well this is connecting to so something that a lot of people feel strongly about, it resonates with what they're thinking, maybe it expresses something they want to say I was called and I had the choice to reject it or to realize, oh wow, I have to do that."</p> <p>"Of course (I sense communication with the natural world) The forest is everything. The forest is life"</p>

Childhood & Family Connection to Nature

Several of the interviewees talked about the importance of their childhood and family connection to nature in shaping their work and relationship to the natural world. Interviewees talked about spending time with grandparents hunting, gardening, fishing, or in the family business which involved horticulture. They spoke about the essential connection with nature formed at this time as foundational to who they are as a person and why they chose their line of work. For example, Grey Kolevzon who's work with Growing Together focuses on sharing ecological knowledge and experiences with children and youth shared the following:

I grew up in the city, and was just like any other city kid, but when my parents split up we started spending summers out where my mom was from - which is really rural South Carolina, it was stunning for me, a really big shock, and I didn't even like it at first...but something about it was really deeply affecting me, and I didn't realize how until later, and the ways that it affected me were that I started to perceive this power of the living world really directly and I started to also understand that it was having an effect on me as a person, like my own life... that relates to my grandparents because my grandfather was a hunter, fisher, farmer, could feel the weather.

Paulino Damiano also talked about foundational experiences with the forest as a healer, teacher, and friend, which started in childhood. Josoah Monja shared that he used to plant trees with his dad as a child. Jenny Leigh Smith grew up on a farm as well. James Calabaza had family knowledge of plants and old ways that shaped his childhood. David Milarch grew up working at his family's tree nursery business all through his teenage years. Interviewees shared the importance of these early experiences with the natural world in shaping their worldviews, and their later work.

Discussion

The results of this study offer a glimpse into the diverse worldviews and experiences of environmental activists, specifically working in the field of regenerative forestation, in countries around the world. Though their work is different in that their organizations have varied strategies and focus areas (urban forestry, healing from violence, improving farmers livelihoods, funding tree planting, ecological restoration, tropical reforestation, and more), and their approaches are locally adapted and culturally located, there were broad commonalities identified in their approaches.

Motivations expressed by leaders interviewed could be categorized as primarily intrinsic (Bruyere & Rappe, 2007). Sense of purpose, altruism, and connection to the natural world were the primary motivators of interviewees.

Leaders expressed big visions of social and ecological transformation, in which they saw their work as a part. They used tree planting and agroforestry as a way to address broader social and economic challenges in their communities. In general, they took pride in growing ecological knowledge and leaving a positive legacy of regeneration. They expressed frustration with challenges of funding their work, and a sense of gratitude and joy in working on a mission with significant personal meaning for them. They relied on organizational partnerships, collaboration, and relationship building to accomplish their goals. They used media to varying degrees of success to bolster the reach of their work.

Throughout the interviews, an organizing theme emerged: the incorporation of indigenous methods, values, and ways of knowing into interviewee's approaches to regenerative forestation.

The following discussion includes consideration of how leaders interviewed are engaging in ways of knowing and leadership styles in line with an indigenous science perspective, a review

of limitations to the study and potential areas for further research, and a conclusion drawing insights from the field of agroecology to orient regenerative forestation towards social and political change.

Applying an Indigenous Science Lens

An Indigenous Science lens can be applied to the results of this study, to postulate that leaders interviewed are integrating, to varying extents and from differing cultural positions, a metamodern¹ indigenous science perspective to their environmental work which guides them to a holistic approach in which they 1) see the problems/solutions on a systems level, 2) bring their heart, creativity, culture, community, and spirit to the work, and 3) work locally, and translocally.

Systems Perspective: Intertwined Eco-Social Approach

In a talk about systems theory, Joanna Macy refers to “the radical interrelatedness of all life” and “dynamic flux” (Macy, 2012) as insights from systems theory to apply to social change framework. Similarly, the interconnectedness of parts and awareness of the flow throughout a system is embedded in indigenous science and indigenous cosmologies.

No matter their particular focus or approach, all the organizations represented by leaders interviewed are at the intersection of ecological and social work. Though we may tend to separate ecological and social interventions and/or impacts for ease of discussing and out of a habitual way of organising information, as interviews with these leaders has underscored, human economic and social conditions are inextricable from the health of ecological systems on which they depend for the necessities of life.

¹ Metamodernism is a term employed to refer to the contemporary moment in thought, art, and culture. As it is still emerging, it is not yet fully defined, but refers to a shift from postmodernist critique, and towards a way of being that is characterized by “higher-order synthesis ... a more integrated pluralism that allows for positive, constructive work” (Henriques, 2020)

Therefore, social and environmental movements must grapple with their fundamental interconnectedness. For those working deeply in the ecological field, they find the roots of the ecological crisis interwoven with the slew of economic and social harms in their community. For tree planting work, this means ensuring the work is designed by (ideally) and in collaboration with, and with direct benefits to local community members. One cannot meaningfully engage with ecological restoration without addressing injustice, economic inequality, oppression against women, and other historic and present-day harms towards marginalized groups. Benefits to local community will look different on a case by case basis, but when financial investments are being made in a region, that money should be directly benefiting the local community. Other than direct compensation, benefits could also include access to training, facilitation support for local organizing, or restoration of local ecosystems under community management that provide water, food, lumber, and other needed goods to local people.

In the worst-case scenario, tree planting initiatives will reinforce a colonial dynamic, enacting forestation on peoples and geographies, non-consensually, for the purposes of extractive industry or even for carbon credits, without consideration of place, history, or ecology. Anyone working in the development sector is well aware of these pitfalls and the co-optation of development work for other goals. On the other hand, in the best cases, tree planting can be a catalyst for community revitalization, women's empowerment, cultural preservation, and democracy (i.e. Green Belt Movement (Maathai, 2010), Loess Plateau Restoration (Liu & Hiller, 2016), Zapatistas agroforestry (Schools for Chiapas, 2016)).

Holistic Leadership

The leadership embodied by those interviewed was not a sterile, or power-over, style of leadership. Leaders consistently recognized the power of their teams, and spoke to uplift their collaborators and colleagues. These leaders bring a sense of creativity, spirituality, intuition, playfulness, and purpose to their work that can be qualified as holistic leadership. They aimed to empower those around them and were experimental in their approach. They formed deep

friendships and communities around their work, engaging in relationality -- a foundational premise cross-culturally in indigenous worldviews (Kimmerer, 2019).

They experimented and iterated with their work, responding and adapting to the needs of the place and time, and exploring the inclusion of art, ceremony, culture, and community building, in their tree planting and restoration work. The use of song, prayer, visual art, and performance, often accompanied tree planting. As there was not an explicit question about the inclusion of art or culture asked in interviews, there was likely even more of this experimentation and artistic approach by leaders and their organizations than was spoken about in interviews, but nonetheless many shared about the importance of art and culture with regards to how they build the movement.

These models of holistic leadership echo an indigenous knowledge approach. In the words of an indigenous author, the “Western mind ... refers to a mindset, to a pattern of mind translated to a way of being The way the Western mind thinks, is diametrically opposed to our collective mind. Often our mind does not think, but often “feels” first, allowing us to see things and spirits others cannot”(Forest, 2009). By including art, song, ceremony, etc., leaders support their community members to engage in regenerative tree planting with their feeling sense at the forefront; with their whole being. The leaders themselves, embodied this as well, bringing their whole selves to the movement.

Local and Translocal Approach

Indigenous knowledge is powerfully and fiercely locally based, though also has a notable ability to zoom out to see whole systems. “Traditional knowledge reveals the dynamics of larger systems” (Alessa, 2009) and can be seen to complement WMS, which tends to focus on microscopes and parts of systems.

Ecological tree planting work is always locally based -- on the ground actors must have intimate knowledge of the local ecosystem, and awareness of local culture and community dynamics.

Even the global or international work that is carried out by transnational organizations relies on local partnerships to accomplish their goals, so that transnational efforts may mostly act as a network, connecting and sharing resources and knowledge, amongst locally based hubs.

Those interviewed who are working outside their country of origin, shared about the ways they work on the ground in deep collaboration with locals and from a place of humility. After many years, they have become integrated in the community. One such interviewee said it is her goal to build local capacity for leadership and eventually transition her role to someone from the community. Several interviewees who are leaders in their own community talked about building partnerships with universities, the forest service, or other western, governmental, educational, or NGO institutions to increase their knowledge and skills in certain areas. These local groups communicate and translate information from these institutions to their communities. They aim to gain these skills internally so as to not be reliant on outside experts in the future.

In addition to building local power, leaders in this field are engaging with translocal collaboration, resource redistribution, and framing of the movement. Even when we work locally there are global implications, as the world is globalized in a new way. Understanding the movement as translocal, leveraging resources, and shaping the narrative is essential to building a collective power towards large scale restoration and justice.

One important element of translocal movement building talked about in the interviews was the need for reimagining global economic structures to better represent real value – i.e. the inherent and foundational value of healthy ecosystems, clear air, water, and habitat for life. This perspective is in alignment with Deep Ecology precepts and the emphasis on the inherent value of life. The word deep in the term deep ecology refers to the “long-range deep approach (that) involves redesigning our whole systems based on values and methods that truly preserve the ecological and cultural diversity of natural systems” (Drengson, 2012).

As the COVID-19 pandemic during the spring of 2020 has made more clear and immediate, we are interconnected and we need cross regional, cross national strategies as well as local organizing. In the 2015 book, *The Man Who Planted Trees*, Jim Robbins talks about the importance of healthy forests to prevent the spread of pandemics, due to the ways that forests emit aerosols that naturally disinfect the air (Robbins, 2015). This is just one more example of why healthy forests are a vital global resource for health, and should be part of a translocal strategy to boost ecological and human health.

When creating or evaluating regenerative tree planting work, perhaps an important answer to remember is “it depends” -- which is a favorite answer of teachers in permaculture. There is not one set strategy that always applies, and yet the only thing that seems to be universal to say is that this work should be locally led. As one interviewee said, people don't destroy their own land, their own forests; thus we see the importance of standing in solidarity with indigenous people to manage and protect their own lands, and to uplift and support small community-led organizations, nurseries, and NGOs led by local people.

Limitations to the Study

As noted in the methods section, the research was not designed to be representative or generalizable. The sample size was limited due to time constraints on the study. Questions asked were very broad and covered a large range of topics - both ecological and social, and about motivations and experiences. This was due to the design of the research as an exploratory study. Further research is needed to more fully delve into topics touched on in the study.

By the end of the fourteenth interview, new information was still arising. Specifically, there was no data saturation or redundancy achieved in the line of questioning about ways of knowing and communication with the natural world by the end of the study. Therefore, further research is needed to be able to draw meaningful conclusions about the variety of ways of knowing that leaders engage in their work, as it relates to cultures and geographies, or philosophical and

spiritual beliefs. More extensive research is also needed to meaningfully hypothesize about if leaders in the environmental movement are guided by a larger “Gaian” or supersystem Earth consciousness.

It is also likely that the relationship between interviewer and interviewee, informed the depth of sharing on some topics. The method of getting in touch, such as a prior relationship as a friend or collaborator, the level of warmth of introduction through mutual friends, or a “cold call” email sent to their email address via their website, may have all influenced the initial level of comfort in sharing. The interviews that were in-person or conducted with video generally seemed to have a level of increased familiarity and comfort. The interviews that were on the phone with no video may not have felt as comfortable for interviewees to share more personal stories, depending on their individual personalities and their culture. In general, in-person interviews would have been preferable, if possible.

There should be an acknowledgment of cultural bias and the inherent limitations of using an academic and western framework to design the study and approach the topics at hand. The researcher and many of those who were interviewed come from westernized backgrounds and have engaged in academic and reflective processes to understand ourselves in relationship with land and to reintegrate ourselves with land. Whereas, according to one interviewee from Kenya, Paulino Damiano, “the forest is life”. People interviewed who were from places where they are more connected to land, may have been better met and more able to express their perspectives with a different framing of those questions. This highlighted the cultural perspective embedded in the formulation of the study.

As a study that looks at ways of knowing, the limitations of a purely academic approach as a way of knowledge generation bears acknowledgement. The study may have benefitted from exploration on how alternative ways of knowing could have been integrated into its methodology, in order to participate in and embody the phenomena that the study seeks to understand.

Areas for Further Study

There are many points covered in this study that warrant further research. The areas that seem most interesting and relevant to the researcher are listed here.

- Transitioning leadership of regenerative projects to community members - case studies, and best practices to ensure success and eventual takeover.
- “Ways of knowing” outside of WMS in ecological movements.
 - How does “Psi phenomena” operate under the surface of social movements through intuition, personal awakenings, sense of ecological consciousness, and collective purpose?
 - In what ways do people who are raised with Western worldviews come to integrate a metamodern indigenous wisdom informed approach into their lives and activism?
- The use of agroforestry as a part of large-scale ecosystem restoration.
- Evaluation of partnerships amongst tree planting organizations around the world, and commonalities between organizations, to frame a global movement.

Insights from the Field of Agroecology

Agroecology, as a field, has a history of praxis as a radical, political, peasant-led movement, which may offer insight to a possible framing of the related field of regenerative forestation. In identifying itself with its grassroots and social movement foundation, agroecology as a movement is less vulnerable to co-optation by institutions, and more able to serve the needs of local communities (Giraldo & Rosset, 2017).

Tree planting, and forest and landscape restoration, much like agroecological practices and organizing has the potential to be a source of economic, cultural, and political power for local communities. The unique moment we are in -- where there is a deeper reckoning with historical and current injustices, and an increased awareness of colonialism, racism, sexism, and destructive capitalism that persist even in our work for social change -- is an opportunity for more radical (“at the roots”), substantive change.

As agroecology has gained popularity, there are now “two radically different ways of conceiving agroecology: one that is technical and technocentric, scientificist and institutional, and the other, a ‘peoples’ agroecology’, that is deeply political and champions distributive justice and a profound rethinking of the food system” (Giraldo & Rosset, 2017). There are similar trends in forest restoration, conservation, and tree planting organizations. Some scientists or celebrities tout the idea that simply planting as many trees as possible will stop climate change (Calma, 2019). Unfortunately, this overly simplistic thinking can cause real harm to communities and ecosystems, while falling short of climate goals (Marshall, 2020), and failing to meet the potential for tree planting to serve as a political and cultural act of resistance.

The interviews in this study also highlighted the importance of popular education -- how this movement spreads person to person, farmer to farmer -- which is a keystone of agroecological movements. Communities engaging with this work are creating new educational paradigms that rely on experiential learning and are based on a weaving and valuing of both Western science and traditional ecological knowledge. An important element of popular education is that culture (in the form of art, song, performance, tradition, and the sacred) is integrated into the ways knowledge is created and shared.

At the time of this research, in the spring of 2020, the Movement for Black Lives has been emerging around the US and around the world, as one of the largest social movements of our time (Kirby, 2020). Thought leaders have made the connection between harms perpetuated to black and indigenous people around the world and the environment for decades through the environmental justice movement and agroecological peasant-led movements for food and land sovereignty (Mies & Shiva, 1993). Bringing an intersectional economic and racial justice lens to the field of ecological restoration is imperative to building a movement that has the power to remake the world. In using this kind of agroecological frame, we can start to understand and position forestation work, as an instrument of decolonization, of cultural reinvigoration, of economic reparation, and as a strategy to build political power.

References

- Abram, D. (2017). *The spell of the sensuous: Perception and language in a more-than-human world*. New York, NY: Vintage Books, a division of Penguin Random House LLC.
- Abram, D. (2019, April 07). A More than Human World. Retrieved from <https://riversong.wordpress.com/a-more-than-human-world/>
- Adger, W. N. (2009). Social Capital, Collective Action, and Adaptation to Climate Change. *Economic Geography*, 79(4), 387–404. doi: 10.1111/j.1944-8287.2003.tb00220.x
- Alessa, L. N. (2009, September). The Other Way of Knowing. *Cultural Survival*. Retrieved from <https://www.culturalsurvival.org/publications/cultural-survival-quarterly/other-way-knowing>
- Bastin, J.-F., Finegold, Y., Garcia, C., Mollicone, D., Rezende, M., Routh, D., ... Crowther, T. W. (2019). The global tree restoration potential. *Science*, 365(6448), 76–79. doi: 10.1126/science.aax0848
- Bayrak, M., & Marafa, L. (2016). Ten Years of REDD : A Critical Review of the Impact of REDD on Forest-Dependent Communities. *Sustainability*, 8(7), 620. doi: 10.3390/su8070620
- Birch, J., Weston, P., Rinaudo, T., & Francis, R. (2016). Releasing the Underground Forest. *Land Restoration*, 183-207. doi:10.1016/b978-0-12-801231-4.00016-1
- Booth, A. (2000). Ways of Knowing: Acceptable Understandings Within Bioregionalism, Deep Ecology, Ecofeminism, and Native American Cultures. *The Trumpeter: Journal of Ecosophy*, 16(1). Retrieved from <http://trumpeter.athabascau.ca/index.php/trumpet/article/view/145/170>
- Bonn Challenge. (n.d.). Retrieved March 2, 2020, from <https://www.bonnchallenge.org>
- Bonta, M., Gosford, R., Eussen, D., Ferguson, N., Loveless, E., & Witwer, M. (2017). Intentional Fire-Spreading by “Firehawk” Raptors in Northern Australia. *Journal of Ethnobiology*, 37(4), 700. doi:10.2993/0278-0771-37.4.700
- Brinkmann, S., & Kvale, S. (2015). *Interviews: learning the craft of qualitative research interviewing*. Los Angeles: Sage Publications.

- Bruyere, B., & Rappe, S. (2007). Identifying the motivations of environmental volunteers. *Journal of Environmental Planning and Management*, 50(4), 503–516. doi: 10.1080/09640560701402034
- Cabello, J., & Gilbertson, T. (2012). A colonial mechanism to enclose lands: A critical review of two REDD -focused special issues. *Ephemera: Theory and Politics in Organization*, 12(1), 162–180.
- Calma, J. (2019, October 25). Planting trees to take on climate change isn't as easy as YouTubers might think. Retrieved from <https://www.theverge.com/2019/10/25/20932700/youtubers-climate-change-team-trees>
- Cambray, J. (2009). *Synchronicity Nature and Psyche in an Interconnected Universe*. College Station: Texas A&M University Press.
- Campbell, L.M. and Smith, C. (2005) Volunteering for Sea Turtles? Characteristics and Motives of Volunteers Working with the Caribbean Conservation Corporation in Tortuguero, Costa Rica. *Mast*, 3(2) and 4(1): 169–193.
- Carroll, R. (2019, July 07). The wrong kind of trees: Ireland's afforestation meets resistance. *The Guardian*. Retrieved from <https://www.theguardian.com/world/2019/jul/07/the-wrong-kind-of-trees-irelands-afforestation-meets-resistance>
- Chazdon, R., & Brancalion, P. (2019). Restoring forests as a means to many ends. *Science*, 365(6448), 24–25. doi: 10.1126/science.aax9539
- Colorado, P., PhD. (1994). *Indigenous Science and Western Science: A Healing Convergence* (Rep.). New York City: World Sciences Dialog I.
- Dowling, M. (2007). From Husserl to van Manen. A review of different phenomenological approaches. *International Journal of Nursing Studies*, 44(1), 131–142. doi: 10.1016/j.ijnurstu.2005.11.026
- Drengson, A. (2012). Foundation for Deep Ecology: Some Thought on the Deep Ecology Movement. Retrieved April 21, 2020, from <http://www.deepecology.org/deepecology.htm>

- Dryzek, J. S., Norgaard, R. B., & Schlosberg, D. (2011). Climate Change and Society: Approaches and Responses. *Oxford Handbooks Online*. doi: 10.1093/oxfordhb/9780199566600.003.0001
- Dubois, C. (Speaker). (2016, November 16). *Session 6: The Car Crash, The Experiment and Women as the Missing Piece ~ with Clare Dubois* [Video file]. Retrieved May 15, 2020, from <https://www.youtube.com/watch?v=c60c3RYZMWE>
- Feineigle, M. (2013, February 22). Before Permaculture: Keyline Planning and Cultivation. *Permaculture Research Institute: Permaculture News*. Retrieved from <https://www.permaculturenews.org/2013/02/22/before-permaculture-keyline-planning-and-cultivation/>
- Forest, O. S. (2009). *Dreaming the Council Ways: True Native Teachings from the Red Lodge*. Red Wheel/ Weiser.
- Friesen, N., Henriksson, C, & Saevi, T. (2012). Hermeneutic Phenomenology in Education. 10.1007/978-94-6091-834-6.
- Giraldo, O. F., & Rosset, P. M. (2017). Agroecology as a territory in dispute: Between institutionality and social movements. *The Journal of Peasant Studies*, 45(3), 545-564. doi:10.1080/03066150.2017.1353496
- Global Mangrove Alliance. (n.d.). Mangrove Forests - a primer. Retrieved from <http://www.mangrovealliance.org/mangrove-forests/>
- Griffiths, R. R., Richards, W. A., Mccann, U., & Jesse, R. (2006). Psilocybin can occasion mystical-type experiences having substantial and sustained personal meaning and spiritual significance. *Psychopharmacology*, 187(3), 268-283. doi:10.1007/s00213-006-0457-5
- Groenfeldt, D. (2003). The future of indigenous values: cultural relativism in the face of economic development. *Futures*, 35(9), 917–929. doi: 10.1016/s0016-3287(03)00049-1
- Harding, S. (2009). *Animate Earth: Science, Intuition and Gaia*. Totnes, Devon, UK: Green Books.
- Hawken, P. (2017). *Drawdown*. New York: Penguin Putnam Inc.

- Henriques, G. (2020, April 17). What Is Metamodernism? Retrieved July 20, 2020, from <https://www.psychologytoday.com/us/blog/theory-knowledge/202004/what-is-metamodernism>
- John Hopkins Center for Psychedelics and Consciousness Research. (n.d.). “*Notable Achievements*” Retrieved June 14, 2020, from <https://hopkinspsychedelic.org/achievements>
- Jung, C. G. (2010). *Synchronicity: An acausal connecting principle* (R. F. Hull, Trans.). Princeton, NJ: Princeton University Press.
- Kennedy, S. (2019, March 12). Indigenous people - best forest stewards? " Yale Climate Connections. Retrieved from <https://www.yaleclimateconnections.org/2019/03/wri-researcher-indigenous-people-are-best-forest-stewards/>
- Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants*. Milkweed Editions.
- Kirby, J. (2020, June 12). “Black Lives Matter” has become a global rallying cry against racism and police brutality. Vox. Retrieved from <https://www.vox.com/2020/6/12/21285244/black-lives-matter-global-protests-george-flloyd-uk-belgium>
- Lead To Life: Press. (n.d.). Retrieved June 02, 2020, from <https://www.leadtolife.org/press>
- Lenton, T. M., & Wilkinson, D. M. (2003). Developing the Gaia Theory: A Response to the Criticisms of Kirchner and Volk. *Climatic Change*, 68, 1–12.
- Lewis, J. L., & Sheppard, S. R. (2005). Ancient Values, New Challenges: Indigenous Spiritual Perceptions of Landscapes and Forest Management. *Society & Natural Resources*, 18(10), 907–920. doi: 10.1080/08941920500205533
- Liarakou, G., Kostelou, E., & Gavrilakis, C. (2011). Environmental volunteers: factors influencing their involvement in environmental action. *Environmental Education Research*, 17(5), 651–673. doi: 10.1080/13504622.2011.572159
- LIFT Economy (2020). *Trees for Climate Health - a primer* (Issue brief). CA: Jonas Philanthropies.

- Liu, J. D. (2015, January). The Great Work of Our Time. *Soka Gakkai International*. Retrieved from https://www.sgi.org/content/files/resources/sgi-quarterly-magazine/1501_79.pdf
- Liu, J. D. (Director). (2017, May 07). *Regreening the desert with John D. Liu / VPRO Documentary / 2012* [Video file]. Retrieved from <https://www.youtube.com/watch?v=IDgDWbQtIKI&t=672s>
- Liu, J. D., & Hiller, B. T. (2016). A Continuing Inquiry into Ecosystem Restoration: Examples from China's Loess Plateau and Locations Worldwide and Their Emerging Implications. *Land Restoration*, 361-379. doi:10.1016/b978-0-12-801231-4.00027-6
- Lovelock, J. E., & Margulis, L. (1974). Atmospheric homeostasis by and for the biosphere: the gaia hypothesis. *Tellus*, 26(1-2), 2–10. doi: 10.1111/j.2153-3490.1974.tb01946.x
- Maathai, W. M. (2010). *Replenishing the Earth: Spiritual Values for Healing Ourselves and the World*. New York: Doubleday.
- Macy, J. (2012, August 13). *Part 11: The Systems View of Life - The Work That Reconnects with Joanna Macy*. Lecture presented at Living Forest Farm. [Video file]. Retrieved from <https://www.youtube.com/watch?v=J7gt1YePVaE&t=2s>
- Mies, M., & Shiva, V. (1993). *Ecofeminism*. Zed Books.
- Miyawaki, A. (2004). Restoration of living environment based on vegetation ecology: Theory and practice. *Ecological Research*, 19(1), 83–90. doi: 10.1111/j.1440-1703.2003.00606.x
- Morton, T. (2010). Guest Column: Queer Ecology. *Pmla*, 125(2), 273-282. doi:10.1632/pmla.2010.125.2.273
- Moustakas, C. (1994). *Phenomenological research methods*. Thousand Oaks, CA: Sage.
- Movement Generation. (2016). *Movement Generation Justice & Ecology Project: Just Transition Framework Resources*. Retrieved from <https://movementgeneration.org/movement-generation-just-transition-framework-resources/>
- Nace, T. (2019, September 30). Ireland Commits to Plant 440 Million Trees to Help Tackle Climate Change. *Forbes*.

- Neubauer, B. E., Witkop, C. T., & Varpio, L. (2019). How phenomenology can help us learn from the experiences of others. *Perspectives on Medical Education*, 8(2), 90–97. doi: 10.1007/s40037-019-0509-2
- Nicholas, G. (2018, February 21). When Scientists “Discover” What Indigenous People Have Known For Centuries. *Smithsonian Magazine*. Retrieved from <https://www.smithsonianmag.com/science-nature/why-science-takes-so-long-catch-up-traditional-knowledge-180968216/>
- NPR (2015, June 9). The #BlackLivesMatter Movement: Marches And Tweets For Healing. Retrieved from <https://www.npr.org/2015/06/09/412862459/the-blacklivesmatter-movement-marches-and-tweets-for-healing>
- Paget, S., & Regan, H. (2019, July 30). Ethiopia plants more than 350 Million trees in 12 hours. *CNN*. Retrieved from <https://edition.cnn.com/2019/07/29/africa/ethiopia-plants-350-million-trees-intl-hnk/index.html>
- Pincetl, S., Gillespie, T., Pataki, D. E., Saatchi, S., & Saphores, J.-D. (2012). Urban tree planting programs, function or fashion? Los Angeles and urban tree planting campaigns. *GeoJournal*, 78(3), 475–493. doi: 10.1007/s10708-012-9446-x
- Radin D. (2014). Getting comfortable with near death experiences. Out of one's mind or beyond the brain? The challenge of interpreting near-death experiences. *Missouri medicine*, 111(1), 24–28.
- Ribeiro, T. (2019, August 06). Semente no chão, floresta em pé (Seed on the ground, forest standing). Instituto Socioambiental (ISA) Retrieved from <https://www.socioambiental.org/en/node/6467>
- Robbins, J. (2015). *The man who planted trees: A story of lost groves, the science of trees, and a plan to save the planet*. New York: Spiegel & Grau.
- Sabogal, C., Besacier, C., & McGuire, D. (2015). Forest and landscape restoration: concepts, approaches and challenges for implementation. *Unasylva*, 66(3), 3–10.
- Schools for Chiapas. (2016, February 08). Zapatista Food Forests of Today: Recouping Ancient Mayan Knowledge. Retrieved from

<https://schoolsforchiapas.org/zapatista-food-forests-of-today-recouping-ancient-mayan-knowledge/>

Shepherd, T. H. (2016). The Convergence of Modern Scientific and Traditional Earth Ways of Knowing, with Implications for Global Education. *International Journal for Cross-Disciplinary Subjects in Education*, 7(4), 2923-2937.
doi:10.20533/ijcdse.2042.6364.2016.0399

Sharma, S. (Speaker). (2014, March). *An engineer's vision for tiny forests, everywhere* [Video file]. *Ted Talks*. Retrieved from
https://www.ted.com/talks/shubhendu_sharma_an_engineer_s_vision_for_tiny_forests_everywhere

Snively, G., & Corsiglia, J. (2000). Discovering indigenous science: Implications for science education. *Science Education*, 85(1), 6-34. doi:10.1002/1098-237x(200101)85:13.0.co;2-r

Spackman, N. (Speaker). (2015, November 30). *10 Keys to Greening the Desert* [Video file]. Sustainable Design Master Class. Retrieved from
<https://www.youtube.com/watch?v=HW6GYcMXpGw&t=1517s>

Spackman, N. (Director). (2020, June 2). *The Story of Al Baydha: A Regenerative Agriculture in the Saudi Desert* [Video file]. Al Baydha. Retrieved from
<https://www.youtube.com/watch?v=T39QHprz-x8&t=285s>

Tauli-Corpuz, V, Alcorn, J., & Molnar, A. (2018). *Cornered By Protected Areas: Replacing 'Fortress' Conservation with Rights-based Approaches Helps Bring Justice for Indigenous Peoples and Local Communities, Reduces Conflict, and Enables Cost-effective Conservation and Climate Action*. Rights and Resources Initiative. Retrieved from
<https://www.corneredbypas.com/brief>

Thomas, E.; Jalonen, R.; Loo, J.; Bozzano, M. (2015) Avoiding failure in forest restoration: the importance of genetically diverse and site-matched germplasm. *Unasylva* 245 Vol. 66 p. 29-36 ISSN: 0041-6436

WeForest. (2018, June 1). Why plant trees in tropical regions? (And not in temperate countries). Retrieved July 5, 2020, from
<https://www.weforest.org/newsroom/why-plant-trees-tropical-regions>

Wodehouse, D., Hobson, A., & Neuhaus, A. (2020, February). Groundbreaking Training Breathes Life into Mangrove Ecosystem Restoration. Global Mangrove Alliance. Retrieved from

<http://www.mangrovealliance.org/ground-breaking-training-breathes-life-into-mangrove-ecosystem-restoration/>

Yin, R. K. (2014). *Case study research: design and methods*. London: Sage Publication.

Zheng, J., Wang, K., Ma, J., He, H., & Liu, Y. (2019). Fish-Scale Pits with Diversion Holes Enhance Water Conservation in Semi-arid Loess Soil: Experiments with Soil Columns, Mulching, and Simulated Rainfall. *Journal of Soil Science and Plant Nutrition*, 19(3), 501-511.
doi:10.1007/s42729-019-00046-7

Appendix

I. Interview Guide

Name:

Organization Name and Mission:

Years running Org/ Year Founded:

Demographics: Age, Gender, Ethnicity

Where are you from:

The inspiration

- What led you to start your organization/ tree planting work? Story of the conception and initiation of the work
- What were you doing before you got that inspiration? What was the process of deciding to follow that motivation?

Ecological considerations

- What regions do you work in?
- What kind of forestation does your organization do?
- In what ways is it regenerative forestation? What practices do you use?

Building the movement

- Can you estimate how many people have participated in the work of your organization?
- In what ways have you shared your vision to include so many more people?
- What has it been like to work collectively to accomplish this work?
- In what ways do you connect and collaborate with other groups?

Communication from the natural world

- How do you experience communication from the plant/ natural world?
- In what ways have you gotten messages from the trees/ or plants you work with? Or more broadly from the “more than human world”
 - how has your work been informed by this?
- Complete the statement: “trees are...” with at least 3 words or phrases

Reflections

- What have been the most important things you have learned from the work?
- Who are other teachers or guides that supported you to develop this vision and in what ways?
- Who else should I interview? Can you recommend other organizations or founders I should get in contact with?

II. Critical Distinctions of Indigenous Science

From a report, *Indigenous Science and Western Science: A Healing Convergence* by Pamela Colorado (PhD) presented at the World Sciences Dialog in New York City in 1994.

As this was a foundational text for the formulation of this study that is not widely available online, the critical distinctions of Indigenous Science as described by Pamela Colorado are reproduced here.

1. The indigenous scientist is an integral part of the research process and there is a defined process for ensuring this integrity.
2. All of nature is considered to be intelligent and alive thus active research partners. We do not act on nature rather we communicate and work with nature.
3. The purpose of indigenous science is to maintain balance
4. Compared with western time/space notions, indigenous science collapses time and space with the result that our fields of inquiry and participation extend into and overlap with past and present.
5. Indigenous science is concerned with relationships, we try to understand and complete our relationships with all living things
6. Indigenous science is holistic, drawing on all the sense including the spiritual and psychic.
7. The endpoint of an indigenous scientific process is a known and recognized place. This point of balance referred to by my own tribe, as the Great Peace, is both peace and electrifyingly alive. In the joy of exact balance, creativity occurs, that is why we can think of our way of knowing as a life science.
8. When we reach the moment/place of balance we do not believe that we have transcended, we say that we are normal! Always we remain embodied in the natural world.
9. Humor is a critical ingredient of all our truth seeking, even in the most powerful rituals. This is true because humor balances gravity.



Norges miljø- og biovitenskapelige universitet
Noregs miljø- og biovitenskapelige universitet
Norwegian University of Life Sciences

Postboks 5003
NO-1432 Ås
Norway