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Ecosystem Restoration as a Social Movement
A Case Study of Camp Altiplano

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Abstract

Ecosystem restoration as a social movement is a promising approach to restoration that addresses flaws and gaps in the dominant institutional approach to restoration. By drawing on the framing approach to social movement analysis, this thesis employs a case study to examine the beliefs that motivate people to participate in ecosystem restoration, asking how participants define the problems that need to be addressed, the solutions to be enacted, and their rationales for acting. Data was collected using participant observation and semi-structured interviews and assessed qualitatively using conventional and directed content analysis. Key findings highlight 1) a tension between the relative importance of supporting restoration versus opposing systems enabling ecosystem destruction, 2) a willingness to engage in restoration work regardless of the outcome, 3) and a deep affinity between agroecology and the restoration movement. The resonance between restoration and agroecology is expressed through participants' focus on values and social organization as key problems and potential solutions, their support for a transition to an agroecological epistemology, and their call for food systems transformation. Future studies should engage with a wider cross-section of the restoration movement and explore the potential of different frames to mobilize support and resources for restoration.

1. Introduction

Study Rationale and Literature Review

Ecosystem restoration is a consequential subject of study and course of action because it offers the potential to reverse some of the anthropogenic impacts on the biosphere while bolstering the resilience of society and biodiversity in the face of a destabilizing global climate. The value of ecosystem protection and restoration is a recurring theme in the 2022 IPCC report "Climate Change 2022: Impacts, Adaptation and Vulnerability" which states that "effective Ecosystem-based Adaptation[1] reduces a range of climate change risks to people, biodiversity, and ecosystem services with multiple co-benefits (p.24). These co-benefits include enhanced agricultural yields, water availability, and soil quality (Van der Esch et al., 2021, p.7) as well as social benefits like job creation (Aronson et al., 2010, p. 144) and improved livelihoods. One case that exemplifies these diverse co-benefits is the restoration of the Loess Plateau in China, where farmers saw a 159% increase in per capita income due to the significantly improved abundance and stability of the resulting agroecosystem (Tang, 2013, p.15). Ecosystem restoration also merits attention because ecosystems have intrinsic value beyond their contribution to human wellbeing and the functioning of the biosphere.

Alongside its co-benefits and potential as an adaptive measure, ecosystem restoration is a promising climate mitigation measure because ecosystems regulate local and global climate by storing carbon and influencing the energy and water balances in that atmosphere. Much attention has focused on the potential of ecosystem restoration to mitigate climate change by sequestering carbon (Littleton et al., 2021), but some researchers state that carbon-centric metrics fail to fully capture the role of ecosystems in regulating local and global climate, suggesting that ecosystem restoration's role in climate mitigation may be more significant than is currently acknowledged by climate models (Lawrence et al., 2022; Sheil, 2018, p.1). Lawrence et al. point to the complex biophysical processes through which living systems interact with the atmosphere to affect atmospheric water and energy balances (2022), while other researchers

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[1] Ecosystem-based Adaptation is defined by the IUCN as including the "sustainable management, conservation and restoration of ecosystems to provide services that help people adapt to both current climate variability, and climate change" (Colls et al, 2009, p.1)

have highlighted the role of forests in pumping moisture across continents and producing volatile organic compounds that cause rain to precipitate from vapor in the atmosphere (Makarieva & Gorshkov, 2007, p.1013). Healthy marine ecosystems may also play a role in regulating climate in ways that are not yet understood, with one example being the importance of whales in mixing the water column in the ocean which in turn influences climate (Lavery et al., 2013. p.31). Much remains to be investigated regarding the complex relationships between biological systems and atmospheric dynamics, but the above lines of inquiry point to the importance of ecosystems in a functioning climate beyond their role as carbon sinks, and the possibility that restoring ecosystems could provide more climate benefits than are commonly acknowledged.

In response to the benefits listed above, recent years have seen a growing awareness and recognition of the benefits that ecosystem restoration offers, leading to a consensus that large-scale restoration efforts and a shared commitment to support restoration are needed. This support is evidenced by the provision of land restoration in many countries' national policies, a range of regional and international commitments such as the Glasgow Forests Declaration, the Bonn Challenge and Aichi Targets, and most notably the UN's declaration of 2021-2030 as The Decade on Restoration (Sewell et al., 2020, p.6). Estimates of the total area of land committed for restoration range from 765 million to 1 billion hectares of land (Sewell et al., 2020, p.6) or about 7% of Earth's total land mass.

Despite growing support for restoration and the recognition by bodies like the IPCC that ecosystem restoration is necessary and feasible (2022, p.22), there are at least two challenges that must be addressed for restoration goals to be achieved. The first of these challenges is a knowing-doing gap or implementation gap: reviews of forest landscape restoration find that institutional capacity and expertise are inadequate to meet existing restoration goals and that there is a need to improve on current capacity for restoration (Mansourian et al, 2019, p.422; Stanturf & Mansourian, 2020, p.38). The second of these challenges is governance, which remains a hurdle in implementing large-scale projects (Mansourian & Sgard, 2021, p.6). Practitioners and scholars both note that ecosystem restoration has been implemented primarily by institutions, an approach which is often top-down and non-participatory, and frequently results in denying the people inhabiting these ecosystems their self-determination

(EcoAgriculture Partners, 2021, p.7; Sapkota et al, 2018, p.90). Bloomfield et al. warn that the shortcomings of this institutional governance model could be amplified by the growing focus on restoration in international and national policy circles, stating that there is a risk that large projects could exclude stakeholders and communities and that vast hectare-based restoration goals could be prioritized at the expense of social and ecological goals (2019, p.2). These risks have also attracted attention within the field of Political Ecology, where critics point to a history of forest restoration projects that have been socially and ecologically counterproductive (Osborne et al, 2021, p.1). These same scholars emphasize the need for an approach to restoration that prioritizes local participation and ownership to achieve just and resilient outcomes that are socially, economically, and ecologically beneficial (ib id).

Ecosystem restoration as a social movement can help address the capacity challenges by directly involving the public in restoration projects as exemplified by the many volunteer restoration initiatives successfully regenerating ecosystems. In a 2009 study of ecosystem restoration movements in the US, Tomblin offers an overview of several organizations involved in ecosystem restoration, including the Voluntary Service Network of the Chicago Wilderness Project (p.193). Tomblin points to the success of this organization, highlighting the potential for movements consisting of ordinary untrained citizens to effectively restore land and produce "legitimate, local, scientific knowledge about restoration techniques" (ibid). The Regent Honeyeater Habitat Restoration Project in Victoria, Australia is another successful case of community-based restoration where 17,000 volunteers including landowners, students, retirees, unemployed people, and inmates from Corrections Victoria worked together to replant over 1000 hectares of Regent Honeyeater habitat (Thomas, 2009, p.95). These two cases demonstrate the viability and value of broad public involvement to build capacity in ecosystem restoration.

Greater public participation also strengthens the governance and successful execution of ecosystem restoration projects. In a review of restoration governance, Sapkota et al. identify a lack of public participation as a limitation of existing approaches to restoration and call for greater public involvement at the local and national level (2018, p.87). The importance of broad and diverse public participation in restoration initiatives is widely recognized in the landscape restoration literature, with many analyses of restoration initiatives stating that participatory

governance and involvement of local stakeholders contributes to successful projects and the attainment of a wider variety of objectives (García-Martín et al., 2016, p.43; Zanzanaini et al., 2017, p.20; Milder et al., 2014, p.78). Ecosystem restoration as a grassroots social movement thus offers a promising and much-needed pathway to complement and balance the institutional approach to restoration.

In this thesis I seek to contribute to knowledge and implementation gaps at the intersections of agroecology, restoration ecology, and social movement studies, so it is necessary to briefly contextualize the relationships between these fields to outline the relevance of the thesis research. Ecosystem restoration is highly relevant to both agroecology and food systems because 37% of global ecosystem restoration commitments are proposed on agricultural land, amounting to approximately 350 million hectares (Sewell et al., 2020, p.23). Indeed, food systems and ecosystem restoration targets are so closely linked that Fagan et al. assert that restoration commitments "will be challenging to meet without the wholesale transformation of food production systems" (2020, p.1). Fagan's call for a transformation of food production systems to meet restoration targets underscores a gap in restoration ecology that the field of agroecology is well-positioned to address with its focus on systemic change and food systems.

Other scholars have also called for agroecology to fill a knowledge gap within restoration ecology and to enable a holistic approach to restoration that situates humans within the ecosystem instead of dispossessing them or separating them from the ecosystem. In a review examining the potential for integrating restoration ecology with agroecology, Garcia-Polo observes that the field of restoration ecology has "largely overlooked agroecology" and that ecosystem restoration in the Global North has historically excluded people from restored ecosystems (2021, p.2). Considering the vast area of agricultural land committed for restoration and the necessity for restoring ecosystems through a socially just pathway that also provides for human needs, this historical approach to restoration that excludes human use is clearly not viable. An agroecological approach can address this shortcoming of restoration ecology through its emphasis on social and political dynamics in agricultural systems as well its explicit focus on engaging with social movements, especially those that are concerned with equitable food systems (HLPE, 2019 p.38).

Ecosystem restoration as a social movement provides an opportunity to integrate agroecology and restoration ecology while making a valuable contribution to the fields of agroecology, restoration ecology, and social movement studies. Focusing on social movement dynamics fits squarely within the scope of agroecology, which is often described as a movement (Mendez et al, 2013, p.i; Nicholls and Altieri, 2018, p.1186; Mier & Cacho et al., 2018, p.637). This direction of research also explores how to scale-out agroecology by examining ecosystem restoration of agricultural land as an expression of agroecological social movements. Some agroecologists have stated that there is a need to place equal emphasis on social as well as agricultural transformations to scale out agroecology, with an emphasis on "collective action to translate agroecological principles into practical strategies for soil, water, and biodiversity management to enhance production and resilience" (Nicholls and Altieri, 2018, p.1172). Camp Altiplano, the ecosystem restoration camp that is the focus of the thesis research, is doing just this, underscoring its relevance to restoration ecology and the scaling-out of agroecology. Alongside its contribution to agroecology and restoration ecology, this thesis is relevant to social movement scholarship, which has called for "empirical examinations of frames and framing within transnational social movements" (Snow et al, 2014, p.37). At the time of writing, the Ecosystem Restoration Camps network is operating in 34 countries on every inhabited continent, underscoring the transnational quality of this social movement organization and the global ecosystem restoration movement more broadly.

Research Objective

The literature reviewed thus far presents a rationale for the opportunity and necessity for ecosystem restoration broadly as well as ecosystem restoration as a social movement. However, for this potential to be realized, it is important to ask, "Why do people choose to participate in ecosystem restoration?" This research question serves as the basis for this thesis, and by exploring possible answers this research seeks to better characterize the driving force behind mass participation in ecosystem restoration and enable a more effective scaling of ecosystem restoration movements. Another goal of this thesis is to understand the ecosystem restoration

movement as it relates to agroecological principles and theory, and to discover to what extent the ecosystem restoration movement is an example of agroecology in action. To generate a rigorous response to this research question, a review of social movement scholarship was conducted, leading to the identification of collective action frames and framing processes (Snow et al, 1986) as the most appropriate theoretical foundation for the research questions and methodology. Snow et al.'s framing perspective is well-suited to address this question because it was expressly designed to understand participant motives, mobilization, and recruitment (Snow et al, 2014, p.26). This theoretical approach to understanding and studying social movements has become some of the most widely cited scholarship within the discipline of sociology and is "a dominant theoretical foundation upon which social movement researchers routinely build their research" (McCammon in Snow et al, 2014, p.31). The extensive use and refinement of Snow et al.'s framework by social movement researchers over the decades since its inception further establishes its fitness as a tool for this thesis research.

Because the framing perspective forms the theoretical core of this thesis and the research questions, it is important to define what frames are and how this theory conceptualizes social movements. The central premise of the framing perspective is that all individuals and organizations are constantly using frames to interpret and make sense of an uncertain world, and that these frames in turn motivate action or lead to inaction (Snow et al, 1986, p.466). Frames were originally described as "schemata of interpretation" that facilitate this process of sensemaking and enable individuals "to locate, perceive, identify, and label" events in their lives and in the broader world (Goffman, 1974, p.21 as cited in Snow et al., 1986). Benford & Snow have since refined this definition to describe frames as "action-oriented sets of beliefs and meanings" that motivate action in social movements (Benford & Snow, 2000, p.614). In other words, frames are the interpretive lenses that people and organizations use to assign meaning to what is happening in the world and in their experience, and these frames determine the kinds of action or inaction that individuals or organizations choose to take. In describing the importance of frames to social movement participation, Snow states that, "by rendering events or occurrences meaningful, frames function to organize experience and guide action, whether individual or collective. So conceptualized, it follows that frame alignment is a necessary

condition for movement participation, whatever its nature or intensity" (Snow et al., 1986, p.464). The creation, diffusion, and adoption of motivating frames through the process of frame alignment is thus a fundamental prerequisite for broad participation in collective action and social movements. Empirical research has also demonstrated that effective frames are a key determinant in the success of social movements (Capek, 1993, p.5). The relevance of the framing approach in explaining why people would participate in collective action to restore ecosystems and the empirical evidence supporting the importance of frames in social movement success both justify the selection of this theory for the thesis research.

Applying the framing approach to the primary research question "why do people choose to participate in ecosystem restoration?" leads to three specific and measurable research questions that correspond to the three core framing tasks articulated by Snow & Benford (1988, p.199). These questions are:

1. "How do participants in ecosystem restoration define the problem or problems they are working to address?"
2. "How do participants frame the proposed solutions to the problem(s)?"
3. "How do participants frame their rationale for engaging in collective action?"

Each of the above questions is a distillation of the diagnostic, prognostic, and motivational or action frames, respectively, which are the essential components of any collective action frame (Snow & Benford, 1988). As their names imply, a diagnostic frame describes some problem in need of change and identifies its cause, while the prognostic frame offers a proposed solution and suggests tactics and strategies (ib id, p.200-201). Motivational or action frames are a "call to arms" that function to motivate people and organizations to participate in a social movement (ib id, p. 202). Included in these action frames are "vocabularies of motive," language which describes the reasons for engaging in action, for example the severity and urgency of the problem, and the efficacy and propriety of action (Benford, 1993, p.195).

Snow & Benford's framing approach in the three research questions provide a theoretical basis for understanding and structuring the beliefs that motivate participants in ecosystem restoration. However, the purpose of this thesis is not to extend or validate the framing perspective. Instead, the framing perspective is used to describes participants beliefs' and

facilitate an exploratory study of ecosystem restoration as a social movement that relates participants' beliefs to core agroecological principles. The analytic generalization of this thesis explores how the frames are expressions of agroecological theory and validates the argument that the ecosystem restoration movement is an example of an agroecological movement. More specifically, the agroecological theories used to support this claim are Richard Norgaard's coevolutionary model (Norgaard & Sikor, 1987), Norgaard's epistemological framework of agroecology (Norgaard & Sikor, 1987), and Gliessman's five levels of food system transformation (Gliessman, 2016).

2. Research Strategy and Methodology

Case Selection

The guiding inspiration for this case study and the thesis research comes from the work of John D. Liu, an ecologist and filmmaker who documented the transformational restoration of the Loess Plateau Watershed Rehabilitation Project in China from 1995-2009. This project saw the restoration of 1,560,000 hectares of agricultural and non-cultivated area through the engagement of farmers in terracing land, planting trees, and temporarily restricting grazing (Shaojun et al., 2004, p.1). Witnessing the potential for collective action to restore ecosystems motivated John Liu to share his vision of large-scale ecosystem restoration as a social movement and eventually co-found the Ecosystem Restoration Camps Foundation (Schwartz, 2020, p.14). This possibility of scaling-out ecosystem restoration and agroecological approaches through social movements drove the thesis research from the beginning. Because the vision and objectives of Ecosystem Restoration Camps were so closely aligned with the thesis research rationale and direction, this organization was selected from the outset as the case study context.

Figure 1. Loess Plateau Restoration before (1995) and after (2009). Image credit IUCN, n.d.

In addition to the alignment between Ecosystem Restoration Camps' mission and the thesis rationale, this organization also satisfied case selection criteria drawn from a literature review of social movements scholarship, restoration ecology, and agroecology. The first of these criteria was that the context would ideally represent the transnational character of the ecosystem restoration movement. This was deemed important to reflect the global scope of the challenge, the potential for global collective action to restore ecosystems, and to address the call within social movement literature for more research on transnational social movements (Snow et al, 2014, p.37). The second criterion focused on projects that openly welcomed the participation of all volunteers in accordance with the need for broad involvement of the public and stakeholders in ecosystem restoration (Sapkota et al., 2018, p.87) and the potential for volunteer-based programs to build restoration capacity and knowledge by training the public in agroecology and ecosystem restoration techniques (Tomblin, 2009, p.193). Given the agroecological focus of the thesis and the call to integrate food system transformation with ecosystem restoration (Fagan, 2020, p.1), the final criterion required that the context should be relevant to agriculture and involve the restoration of agroecological systems. As described further in the following paragraph, Ecosystem Restoration Camps and Camp Altiplano satisfied all these criteria.

The Case: Ecosystem Restoration Camps and Camp Altiplano

Ecosystem Restoration Camps describes itself as "a global movement of people that is creating an abundant earth" (Ecosystem Restoration Camps, n.d.) and consists of a network of independent landscape restoration projects supported by the Ecosystem Restoration Camps Foundation (ERCF). Founded in the Netherlands in 2017 (Brown, 2021), the ERCF seeks to address the technical and scientific implementation gaps in restoration efforts such as those cited by Mansourian (2020, p.422) and launch restoration projects with a high degree of participation and stakeholder involvement (Vision, Mission, & Foundation, n.d.). The organization's overarching goal is to involve 1 million people in ecosystem restoration across 100 camps around the world by 2030 (Ecosystem Restoration Camps, n.d.), highlighting ERC's focus on broad public participation. At the time of writing, there are currently 38 camps in the network, 2,721 hectares under restoration, and 10,414 campers that have participated in restoration activities (Ecosystem Restoration Camps, n.d.). ERC's alignment with the thesis rationale and implementation gaps stated above are further highlighted in the organization's five objectives found in their mission statement:

1. "To train people in techniques for restoring land and provide practical opportunities for people to practice new approaches to landscape restoration.

2. To build research, training, and innovation centers to engage people in ecosystem restoration.

3. To manage a flow of volunteers of all ages to restore agricultural and natural ecosystems.

4. To increase the organic matter, carbon content and water retention capacity of the soil to stimulate large scale carbon sequestration.

5. To improve the livelihoods of farmers, landowners and local communities around the camps." (Vision, Mission, & Foundation, n.d.).

Through their work towards these objectives, ERC is helping to catalyze a transnational social movement in ecosystem restoration and agroecology, build capacity by training volunteers in ecosystem restoration and agroecological approaches, and support food system transformation by restoring agricultural land and collaborating with farmer cooperatives.

Figure 2 Global map of ecosystem restoration camps in March 2022. Image credit Ecosystem Restoration Camps, n.d.

After identifying ERC as the overarching context for the case study it was necessary to further narrow the focus of the context to a particular location within this network of camps. A range of factors were considered in selecting a site to study, including proximity to Norway, site availability, and the degree to which agriculture and ecosystem restoration were integrated in the project. Many of the camps within the network are still in the early stages of development, which further limited the range of camps being considered.

Camp Altiplano in Spain quickly emerged as the most promising context for the case study for several reasons. The first reason for selecting Camp Altiplano is that it is the founding camp within the global ERC network, and thus offers the most established base of experience to draw from among the camps in the ERC global network. Camp Altiplano is also located relatively close to Norway compared to the rest of the camps, and after contacting Camp Altiplano I discovered that the manager was receptive to my research and that there was a tree planting project planned during my scheduled window for field research which would provide an opportunity to participate in restoration alongside other volunteers.

Figure 3: Aerial view of Camp Altiplano in August 2014 (left) and August 2019 (right). Image credit: La Junquera, n.d.

Camp Altiplano was also an attractive study context because of its focus on the agroecological restoration of farmland. As part of La Junquera, Camp Altiplano is focused on creating a commercially viable and agroecological model of agriculture that combines regenerative agriculture with biodiversity restoration and farmer livelihood improvement. The 5-acre camp site is located on La Junquera, a 1100 hectare farm in the agricultural region in Murcia in southern Spain surrounded by vast areas of heavily tilled almond monocultures and eroded soils. This region is a semiarid environment where water is often a limiting factor in agriculture

and most crops are rainfed. Camp Altiplano was once a monocultural grain field, and this initial state of degraded agricultural land puts Camp Altiplano in a position to demonstrate the potential pathways of restoring similar agricultural land in the region. Much of the restoration work at camp takes place on the fields, shrubland, and forest areas on the farm property using techniques including swales, keyline design, seeding of cover crops, water retention landscapes, the creation of a riparian zone, rotational grazing, agroforestry integrating almond and aromatics production, and a forest garden that is irrigated by the camp's greywater.

Figure 4 Camp Altiplano and surrounding landscape. Photograph taken during field work.

Another reason for selecting Camp Altiplano for this case study is its role as a node in linking local and transnational restoration movements. Through the Ecosystem Restoration Camps network, Camp Altiplano hosts volunteers and operates courses that connect this region to participants from other parts of Europe and the world. Camp Altiplano also collaborates closely with AlVelAl, a local farmer cooperative consisting of 250 members that trains local farmers and citizens in ecosystem restoration and regenerative agriculture, provides technical support for farmers, advocates for regenerative practices, and organizes collective action in ecosystem restoration such as reforestation and seed gathering. AlVelAl serves a political and economic role

in the local restoration movement by providing collective representation for farmers in dialogues with government institutions and offering shared processing space for regeneratively cultivated products. This confluence of factors in the larger system within which Camp Altiplano is embedded in signaled that the site was especially relevant to the ecosystem restoration movement, a feasible context for case study research, and that it was integrating food system transformation with ecosystem restoration, themes which were all identified as important to the thesis research objectives.

Figure 5: Aerial view of La Junquera. Image credit Regeneration Academy, n.d.

Case Study

A case study method was selected for its fitness in analyzing a contemporary example of ecosystem restoration as a social movement and helping me provide the information needed to answer the research questions. In *"Case Study Research and Applications,"* Robert Yin lists three conditions for the applicability of a case study method, which are:

1. The research questions are "how" and "why" questions,

2. The research does not "require control over behavior or events," and

3. The research "focuses on contemporary events" (2018, p.9).

All these conditions apply to the research questions listed above and the context of Camp Altiplano, indicating the suitability of this method for the thesis. Yin and social movement scholars highlight that the case study has been used to investigate social movements, further supporting this choice of method in the context of ecosystem restoration as a social movement (Yin, 2018, p.29; Snow & Trom, 2013, p.149). In "Methods of Social Movement Research," Snow & Trom offer an extensive guide on how to best apply the case study methodology to social movements, where they state that case studies often focus on a specific theoretical concept or process such as framing or movement participation (ib id). Through analytic generalization, this study of a particular process in a given context can shed light on a more general phenomena, theory, or the character of a broader social movement (ib id). In the case of the thesis research, observation and analysis of the frames used in the context of Camp Altiplano were conducted with the goal of generalizing and illuminating framing processes and participation in the ecosystem restoration movement globally.

Data Collection

The data collection process began in June 2021 when contact with Camp Altiplano was initiated. During this correspondence the goals of the research were explained, and the camp manager confirmed that the camp could host me as a researcher and volunteer. An intensive tree-planting effort was planned for November, which was an appealing opportunity because it provided an opening to participate in the restoration work alongside other volunteers. Volunteers staying for a short period of several weeks comprised the largest sample group at the restoration camp, but there were also other individuals that participated in the study that were involved with restoration activities, programs, or enterprises at La Junquera. These individuals were included in the study because they were seen as potential participants of the restoration movement, which was confirmed during the interviews.

A qualitative mixed-methods approach to data collection was adopted from the outset because it enables the production of holistic, rich, and contextualized analyses of the "cultural systems of action" that constitute social movements (Snow & Anderson 1991, as cited in Snow & Trom, 2013, p.150). Qualitative methods of data collection including semi-structured interviews and participant observation are frequently used in case studies of social movements and social movement framing research specifically because they enable researchers to describe the frame utilized by participants and understand how the frame interacts with its context (Snow et al, 2014, p.31), for example by shaping participant behavior and movement outcomes. This mixed-method approach also responds to calls within the field of landscape restoration for more empirical research of restoration initiatives combining multiple methods including direct observation and interviews (Milder et al., 2014, p.79).

Semi-Structured Interview

Qualitative interviewing was selected as a data collection method primarily for its emphasis on the perspective of interviewees (Bryman, 2008, p.470). This approach prioritizes the interviewee's perspective above the researcher's concerns (ib id), which was a distinct advantage given that the research objective was to discover the frames that participants used to make sense of the world and assign meaning to their ecosystem restoration activities. By encouraging interviewees to take questions as a starting point for a longer discussion or explanation, qualitative interviewing offers "insight into what the interviewee sees as relevant and important" (ib id). During the interviews, allowing for these tangents often led to patterns, life stories, and connections that would not have emerged otherwise. A second strength of qualitative interviewing that made it an appropriate method was its greater suitability for research that relies upon more general ideas (ib id), such as diagnostic, prognostic, and motivational frames. The widespread use of qualitative methods in collecting data on frames was taken as a further indicator that a qualitative approach was an appropriate data collection method for the research questions (Ketelaars, 2014).

Among the different types of qualitative interview formats available, the semi-structured interview best fit the needs of the research questions. The semi-structured interview provided

the scaffolding to organize the interview around the diagnostic, prognostic, and action framing components while also offering the flexibility for participants to elaborate on their perspective and the unique meaning each frame held for them. In semi-structured interviews, it is common to ask questions in a different order from interview to interview and ask follow-up questions (Bryman, 2008, p.470), which allowed each interview to take a more informal and conversational tone. This led to a more natural flow during the interviews, which seemed to help interviewees feel more comfortable in sharing their perspectives, and the emotional and personal elements that often accompanied these responses.

In preparation for the semi-structured interviews, an interview guide was developed to offer participants an opportunity to elaborate on the frames that motivated their participation in ecosystem restoration. Each frame corresponds to each of the three research questions:

1. How do participants define the problems ecosystem restoration is attempting to address? (diagnostic frame)

2. How do participants define the solutions to the stated problems? (prognostic frame)

3. How do participants define the motivating rationale for participating in ecosystem restoration? (motivational frame)

The interview questions were designed to translate the theoretical concepts of frames into conversation prompts that were relatable, easily understood, and open to respondents' interpretation. Framing research literature was consulted in the interview guide design process, and Ketelaars' three open-ended survey questions for empirical research of frames were taken as a reference and starting point in creating the interview guide (2014, p. 509). Ketelaars' questions were adapted to yield four primary interview questions:

Q1 What is the problem that you are trying to address through your participation with or support of Ecosystem Restoration Camps? (diagnostic frame)

Q2 What is the cause of this problem(s)? (diagnostic frame)

Q3 What should be done to address this issue(s)? (prognostic frame)

Q4 Why do you participate in or support ecosystem restoration? (motivational frame)

Participants were also asked to elaborate on the prognostic frame by describing a desired future state and to comment on how optimistic they were that this state would be achieved. These

questions were added to incorporate study participants' perspectives on the efficacy of their actions, a component of both the prognostic and motivational frame (Snow & Benford 1988, p.201; Benford, 1993, p.205). Efficacy of action was deemed an important frame element to include in the data collection following the longstanding assumption within social movements that "successful mobilization hinges on shared beliefs that collective action will produce the changes desired," an assumption which has been validated by empirical social movement research (Snow, 1993, p.204).

Additional questions were included to capture a holistic picture of what led each respondent to participate in ecosystem restoration and how their frames motivated their actions. For example, participants were asked to describe how they came to join the restoration camp, which linked their experience and biography with frames and a reason for participating in the restoration work. This approach is theoretically consistent with the role of frames in interpreting one's life experiences (Snow et al., 1986, p.464) and empirically consistent with Snow's study of frames, which found that participants' biographies exert a profound influence on the frames that people rely upon to make sense of the world and guide action (Snow et al., 2014, p.26). The full interview guide can be found in Appendix 1.

Interviews were conducted in person over the two-week field research period at Camp Altiplano, and all the participants except for two were interviewed individually. The two respondents that were interviewed together were partners in an enterprise that provides marketing, education, and communications strategy services for farmers and businesses in regenerative agriculture. Scheduling constraints and the close relationship between these two respondents' framing processes justified the decision to depart from the individual interview method and interview them together. A total of 13 interviews were conducted, ranging from 15 minutes to 53 minutes in duration, with an average duration of 31 minutes.

Participant Observation

Participant observation was selected as a complementary data collection method in the research because it enabled a direct study of participants and their interactions with each other,

the physical environment, and the social environment (Laitinen et al., 2014, p.11). It was essential to include social interactions in the thesis framing research because framing at its core is a social process of meaning construction. In a review of new directions for framing research, Hewitt & Fitzgerald articulate the value of participatory approaches to social movement research and the integral need for considering social interactions, stating that:

> "[the framing perspective] is rooted in symbolic interactionist understandings of the process of meaning construction and the ways in which people make sense of their world. When someone attends a protest, when they argue with other activists or with counterprotesters or even family members, and when they follow issue-specific blogs, they are engaged in a process of meaning construction—an ongoing, ever-changing and dynamic process. There is a case to be made that frame analysts should not lose sight of this guiding assumption and that research should focus on the microlevel processes whereby individuals create meaning through social interaction." (Snow et al., 2014, p.38)

Participant observation allowed me to closely observe and engage in the process of framing that occurred during the everyday interactions of restoration work, mealtime conversations, and evening chats in front of the fireplace, and use these experiences and social interactions to contextualize the frames that emerged in the interviews.

This observational approach to researching frames within the restoration movement also responds to calls within social movement studies for more direct interactions between frame researchers and the activists creating frames in order to break down the activist-theory gap (Ryan, 2005, p.118, as cited in Snow et al, 2014, p.37). In defining participant observation as a data collection method, Bryman describes the process by which participant observation facilitates these interactions between researcher and participants. These processes include

> "immers[ing] the researcher in a social setting for an extended period of time, mak[ing] regular observations of the behavior of members of that setting, listen[ing] to and engag[ing] in conversations" and "develop[ing] an understanding of the culture of the group and people's behavior within the context of that culture." (Bryman, 2008, p.433).

These descriptions of participant observation served as guiding principles for the data collection during the field work.

Data on participant observation was collected by taking field notes which were recorded according to established guidelines regarding participant observation (Bryman, 2008; Kawulich, 2005). Throughout each day, I frequently wrote abbreviated notes as events or conversations occurred that were relevant to the frames, research questions, or that provided context into the larger system of action at the camp. These notes included information about activities (including who was involved, and when and where they took place), conversations, (including the themes, tensions, or framing elements that emerged), and other observations of the physical environment and study context (Kawulich, 2005, p.21). At the end of each day, I compiled my notes and expanded upon them with other details that I recalled and included alongside these summaries my initial reflections and impressions. These reflections provided some initial analytic insights into the patterns I was observing and how the frames of different participants were interacting with each other. Following Kawulich's principles, I took care to distinguish between events I observed and my own assumptions or (Schensul et al, 1999, as cited in Kawulich, 2005, p. 21). As a supplement to my written field notes, I also took photographs of our activities and the experience which helped to refresh my memory as I compiled my notes in the evening and revisited my notes during the data analysis stage.

Participants

During my stay at Camp Altiplano, I was fortunate to have the opportunity to interview all 12 of the volunteers at camp, as well as the camp manager and an employee of the Rural Entrepreneurship Program at La Junquera's Regeneration Academy. Two of the volunteers at camp also performed other roles that were highly relevant to the framing process within the local restoration movement through their work as founders of the A Regenerar association. This association, whose name translates to "Let's Regenerate," organizes educational programs in restoration and regenerative agriculture, coordinates social media campaigns centered on restoration, and provides marketing and communication support to farmers adopting regenerative practices.

In terms of the study participant demographics, all of the participants were from Europe, with the Netherlands being the most represented country (6 participants), followed by Spain (4 participants), and then Italy, Finland, Latvia, and Belgium (1 participant from each). The average and median age of participants was 38 and 34 years old, respectively, and there were 9 men and 5 women that participated in study.

Ethical Considerations

During the study design and field work processes, Diener and Crandall's four categories of issues in research ethics were consulted to identify possible ethical considerations and to ensure that the study adhered to high ethical standards. These four areas of research ethics concern:

1) "whether there is harm to participants
2) whether there is a lack of informed consent
3) whether there is an invasion of privacy
4) whether deception is involved" (Diener and Crandall, 1978, as cited in Bryman, 2008, p.135).

With respect to the first principle of anticipating and avoiding harm, participants were protected from harm by anonymizing all the data collected through participant observation and interviews. Interviews were recorded using the Diktafon app, encrypted, and stored on Nettskjema servers for security. After transcribing the interviews, these recordings were deleted, and the field notes were destroyed at the conclusion of the thesis research.

Obtaining informed prior consent was another key component of the research's ethical integrity. This process was straightforward for the interview: after indicating a willingness to participate in the study, respondents were presented with a consent form that provided an overview of the research objectives, participants' scope of involvement, data management practices, the individuals and institution responsible for the research, and the purpose of the study. This consent form also included information about participants' rights, including the right to withdraw from the study, and contact information where they could send requests to withdraw or have their information amended. Obtaining formal informed prior consent for participant observation was more challenging, an issue that Bryman acknowledges in describing

the ethics of participant observation, stating that "the researcher is likely to come into contact with a wide spectrum of people, and ensuring that absolutely everyone has the opportunity for informed consent is not practicable, because it would be extremely disruptive in everyday contexts" (Bryman, 2008, p.140). There were some interactions and people that I observed during my field research that I was not able to obtain consent from, but those that I spent the most time with and interviewed did have my contact information from the interview consent form and were informed of their right to freely contact me to withdraw from the study.

Protecting the privacy of participants was a third consideration that was relevant to the study. During the interviews, participants often connected their responses to their personal lives, including for example their family relationships and their professional experiences. As a researcher, I respected participants' privacy by asking follow-up questions only as they related directly to the research questions and the scope that I had received consent for in the information and consent form. However, I did listen and allow space for participants to elaborate on the personal dimensions that they found relevant and meaningful, and I am thankful for the openness and sincerity that participants brought to these conversations. It was also important to respect the privacy of participants as I observed and participated in the many conversations and interactions during my two weeks of living at Camp Altiplano. I recorded many of these observations and impressions in my field notes, but again respected the privacy of participants by omitting any personal information that could be sensitive. The anonymization of all data as described above further contributed to the protection of participant privacy.

The use of deception and its attendant ethical challenges were avoided in the thesis research by informing participants of my role as a researcher and the goals of my research when I introduced myself to each person. I openly explained that the reason I was at Camp Altiplano was to conduct field work which included observing and participating in the camp activities as well as interviewing other respondents. It was important that those that I interacted with understood that I was participating in all the activities and conversations as both an individual with genuine personal interest in restoration as well as a researcher in the process of collecting data. This is in line with conducting participant observation as an Overt Full Member, as I enjoyed full membership of the group while also making my status as a researcher known (Bryman, 2008,

p.441). Finally, in addition to the ethics measures and considerations described in this section, the research methods, data collection, and data management plan were submitted to NSD and found to be compliant with NSD ethics and data management guidelines.

Data Analysis

The objective of the research questions in this study was to describe, map, and understand the meanings and content of the frames that motivated participants to engage in ecosystem restoration. Qualitative content analysis suits these objectives by placing an explicit focus on the "content or contextual meaning" of the text, and for this reason was selected as a data analysis method (Budd, Thorp, & Donohew, 1967, as cited in Hsieh & Shannon, 2005, p.1278). By closely examining the meaning of qualitative text, this approach enables researchers to condense large datasets into a set of categories that carry similar meanings, which was ideal for mapping the frames, patterns, and frame components in the interview responses (Weber, 1990, as cited in Hsieh & Shannon, 2005, p.1278).

Data analysis began with the manual transcription of interview audio files into text documents. These transcripts were then loaded into NVivo, where they were read several times to gain a perspective on each participant's responses as a whole (Hsieh & Shannon, 2005, p.1279), and then coded in two phases. The first phase of coding utilized directed content analysis, an approach which relies on an existing theoretical framework to generate initial categories and coding schemes and seeks to validate or extend the theory being used (Hsieh & Shannon, 2005, p.1281). Given that the research questions were structured around Benford & Snow's framing theory and the three core framing tasks of diagnosis, prognosis, and motivation (2000), it was these three categories that formed the coding scheme for the directed content analysis.

The coding scheme for the diagnostic frame was defined by descriptions of "some event or aspect of social life as problematic and in need of alteration" or the "identification of a problem and attribution of blame or causality" (Snow & Benford 1988, p.199-200). As such, contents that described a problem or its causes were coded under the diagnostic frame. The prognostic frame is described by Snow & Benford as a set of solutions, strategies, tactics, and targets (1988, p.200), and so this prognostic frame code was applied to text wherever participants were describing

what needed to change, what must be done, and how it should be done. The third code used in directed content analysis was the motivational frame, which describes a call to action (Benford & Snow, 2000, p.617).
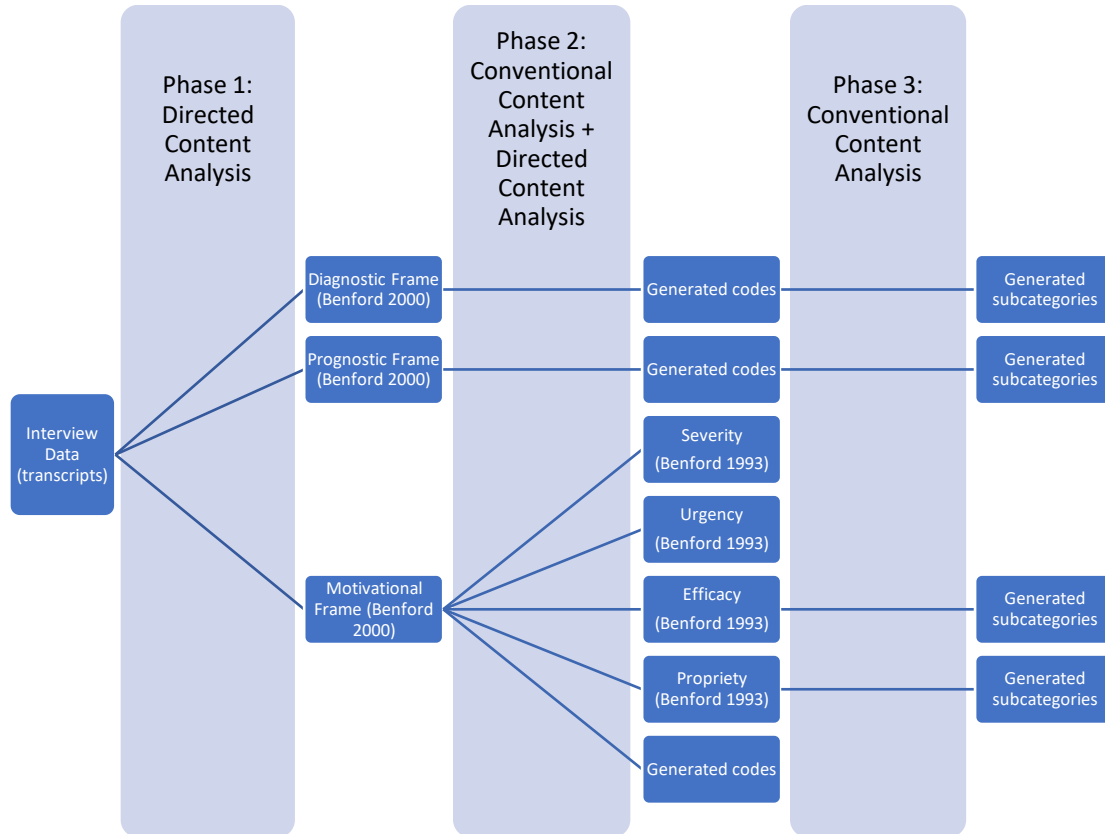
Figure 6: Diagram of data analysis process

The second phase of the coding involved categorizing the data that had been grouped in the diagnostic, prognostic, and motivational frames in Phase 1. Based on the initial literature review of Benford & Snow's framing theory, sub-categories for the diagnostic and motivational frames were identified and used as initial codes, continuing the process of directed content analysis. For the diagnostic frame, these sub-categories were the four sets of causes identified by Snow & Benford in their study of the nuclear disarmament movement: technological, political, economic, and moral (1988, p.200). However, during the process of coding the data in the diagnostic frame, it became clear that these four causes did not fully capture the causes identified by respondents, and so they were modified and expanded according to the conventional content analysis approach that is described later in this section. 7 codes and 18 sub-codes emerged in the process of categorizing the content within the diagnostic frame.

Unlike the four sub-categories proposed by Snow for the diagnostic frame, the sub-categories for the motivational frames as outlined by Benford fit the data quite closely, and these were kept in their original form and expanded upon with additional codes that emerged from the data. These four sub-categories for the motivational frame were extracted from a 1993 study of the US nuclear disarmament movement, where Benford identifies four specific "vocabularies of motive" or sub-categories of motivational frames: severity, urgency, efficacy, and propriety. The severity and urgency codes describe a need to act due to the severity and urgency of the problem, while the efficacy and propriety codes relate to the efficacy of action and moral duty to participate (Benford, 1993). These codes were used to identify and code text that belonged under the motivational frame code, and to categorize the motivational frames. In addition to the 4 codes extracted from the literature (efficacy, propriety, urgency, and severity) 3 codes were developed from the data using conventional content analysis, yielding a total of 7 codes for categorizing the motivational frame. 5 additional sub-codes were created to categorize the data within these codes. No codes for the prognostic frame were identified during the literature review of framing theory, and so the second phase of coding for the prognostic frame consisted entirely of conventional content analysis.

The third phase of analysis involved reviewing the data in each of the categories, creating subcategories, and sorting the data into these subcategories. Graneheim & Lundman state that "creating categories is the core feature of qualitative content analysis" (2003, p.107), and in this third phase the creation and application of subcategories was central to the analysis. These subcategories were often contained explicitly in the language found in the interview text as manifest content (Graneheim & Lundman, 2003, p.106), for example when participants would point to agriculture as a solution or culture and values as problem descriptions within the diagnostic frame. Other times, there was a need to infer the underlying meaning or latent content (ib id) of the text, for example when participants implied that there was moral propriety and a duty to participate in restoration activities but stopped short of saying it in such words.

The coding followed conventional content analysis according to the guidelines set forth by Hsieh & Shannon (2005) and Graneheim & Lundman (2003). Throughout this process of category creation and coding in the second and third phases of analysis, categories were regularly

reviewed to ensure that they were internally consistent and aligned with the content analysis method as established in the qualitative research methods literature. Categories and codes were developed that were "internally homogenous and externally heterogeneous", meaning that content within a category shared common qualities and were clearly differentiable from the content in other categories (Patton 1987, as cited in Graneheim & Lundman, 2003, p.107). Another objective in the coding process was to ensure that categories were "exhaustive and mutually exclusive" such that all data were assigned a category, and that no data fit between categories or into two or more categories (Krippendorff, 1980, as cited in Graneheim & Lundman, 2003, p.107).

Two challenges emerged in this process of subcategorization. The first of these was when multiple categories applied to a meaning unit. Although qualitative content analysis should create categories and sort data to avoid this, Graneheim & Lundman acknowledge that this is not always possible due to the "intertwined nature of human experiences" (2003, p.107). It was not always possible to apply mutually exclusive categories to every meaning unit, because interviewees often linked categories together, or described multiple categories in association with one another. Take for example this respondent's description of a diagnostic frame:

> "I think it's also our detachment from nature, the fact that we are not raised knowing how plants grow, knowing how to plant a tree, knowing how to build a fire. And I think for me it's very much about the philosophy that capitalism has brought us, that consumerism has brought us, detaching ourselves from nature, from the earth."

In this meaning unit, the respondent addresses people's relationship with earth at the same time that she attributes the problem to an economic system and cultural values. This meaning unit was thus coded as "Relationship with Earth and Nature", "Economic System", and "Consumerism". The second challenge that emerged was when no subcategories applied to text within a category, leading to a subcategorization system that was not exhaustive. For example, when reviewing the body of data coded as "culture and values", there were some instances where meaning units did not provide any specific detail that would allow it to be subcategorized, as when a respondent simply described the issue as "a cultural problem". In such cases, the data

was not subcategorized, which led to most of the data being subcategorized while some of it remaining in the category without a subcategory code.

After coding all the interview data, categories were reviewed once again, and similar categories were grouped under a hierarchical structure to organize the categories and their relationships following Hsieh & Shannon (2005, p.1279). For example, many respondents identified the economic system, political system, and media as causal factors in the diagnostic frame, and these were grouped together under the label 'institutions'. Examples of coding can be found in appendix 3.

After analyzing the interview data, field notes from participant observation were coded according to the categories developed in the analysis of transcripts. This process was informed by Kawulich's (2005, p.22) recommendations for analyzing participant observation data whereby coded data are organized into an outline with similarly coded data being grouped together. While coding the field notes, particular attention was given to instances that showed the interaction between participants and their perspectives to illuminate the social process of meaning construction. These groups of coded participant observation data were then combined with the coded data from the interviews to provide a holistic picture of each of the framing components and their categories. A portion of the coded outline of participant observation notes is presented in appendix 4 as an example.

3. Results

Diagnostic Frame
Overview

This section of the results responds to the first research question concerning the diagnostic framing function: "How do participants in ecosystem restoration define the problem or problems they are working to address?" The table below provides an overview of participants' responses that are related to the diagnostic frame, listed in order of decreasing prevalence, and structured according to the hierarchy of codes that emerged in the coding and categorization process. Prevalence of codes are visualized in the table by purple and blue shading, with darker shades corresponding to more frequent appearance. Purple shading represents the total

prevalence of a code across all interview data, taking into account when a code appears repeatedly in one interview transcript, while blue shading represents the proportion of interviews in which that code appeared, irrespective of whether the code appeared once or many times in an interview.

Frame	Category	Sub-category	Sub-subcategory	Total number of times code appeared across all interviews	Number of interviews in which code appeared	Percentage of interviews in which code appeared
Diagnostic				233	13	100.0%
	Culture and values			57	11	84.6%
		Relationship with earth and nature		14	7	53.8%
		Awareness and mindset		8	4	30.8%
		Consumerism		5	4	30.8%
		Values		5	3	23.1%
		Individualism		3	3	23.1%
		Lack of community		3	3	23.1%
		Relationship with self		3	2	15.4%
		Will to act		1	1	7.7%
	Land degradation			41	12	92.3%
		Agriculture		30	11	84.6%
			Agricultural practices	7	3	23.1%
			Agricultural policy	3	2	15.4%
			Food system	2	1	7.7%

		Deforestation		5	5	38.5%
		Desertification		3	2	15.4%
		Water management		2	2	15.4%
	Institutions			25	8	61.5%
		Economic system		16	6	46.2%
		Political system		6	3	23.1%
		Media		2	2	15.4%
	Climate			13	6	46.2%
		Global climate change		7	5	38.5%
		Regional climate		4	2	15.4%
		Local climate change		2	1	7.7%
	Complexity			9	4	30.8%
	Rural depopulation			6	3	23.1%
	Energy use			1	1	7.7%

Table 1: Summary of diagnostic frame codes and prevalence.

Culture and Values

Throughout most of the interviews, culture and values were frequently identified in the diagnostic frame, both as a causal factor of problems and as the problem itself. The culture and values code appeared more than any other category within the diagnostic frame. Within this category, the most frequently mentioned subcategory that participants highlighted was the relationship between human society and the earth or nature, describing a human culture that is

detached from nature. Participants characterized this relationship using words like "detachment", "extraction", "control", and "exploitation" (Interviews, November 9-21, 2021). This relationship of separation from ecosystems and the earth is described in both philosophical and physical terms by participants:

> "I think it's also our detachment from nature… the philosophy that capitalism has brought us, that consumerism has brought us, detaching ourselves from nature, from the earth…a lot of people seem to be detached from nature, and seem to not want to be in it anymore. There's this distance and it keeps growing and growing because we live in skyscrapers and we don't even touch soil or trees anywhere, it's not around us anymore. I think that's causing us to damage the planet and not realize what we are doing." (Interview, November 17, 2021).

Alongside this relationship element is the problem of mindset and awareness. Awareness and mindset were integrated into one category because respondents often linked the two concepts together. One respondent placed particular emphasis on mindset, stating that "the main problem is mentality" (Interview, November 15, 2021). This problematic mentality was described as a dysfunctional and old-fashioned attachment to the conventional, the industrial, and the mainstream: "people are mostly used to one kind of agriculture or system, or industrial management, and we are trying to change that." (ib id). When elaborating on the problem of mentality, another participant pointed out the window of the room we were sitting in towards the crumbling ruins of a farmhouse and the degraded landscape outside:

> "the regenerative mindset [points finger towards the maintained and upright buildings of La Junquera] and the conventional mindset [points finger towards crumbling ruins nearby], all the buildings collapse, sheep, monoculture. And here [at La Junquera], young people are living, rebuilding, diversification. I think it's very graphic to see these two mentalities. Also, young people, they see the countryside as a bad sector for work. They have the idea that if I don't have an education or other options, the countryside is there. So we have to change the mentalities, because it is the opposite." (Interview, November 12, 2021).

This problematic mindset sees rural areas as devoid of opportunity and potential, burdened with stereotypes of village life as backwards and offering no desirable future for young people.

In describing the problem of awareness, one respondent also commented on a general lack of awareness of "regenerative farming or permaculture" in Spain compared to other contexts. (Interview, November 12, 2021). Another respondent conceptualized the problematic awareness differently, stating that "we need to restore because people before us and people now are not really thinking about the consequences of their actions." (Interview, November 16, 2021). This quote suggests both a lack of awareness of future consequences, and a mindset that is oriented towards the short term. In summary, this problematic mindset is described by participants as business-as-usual, lacking awareness of the regenerative potential of rural areas, insensitive to ecological considerations, and is associated with monoculture and short-term thinking.

A third subcategory within culture and values that emerged is consumerism, which participants defined as the problematic and destructive belief that happiness and fulfillment come through consumption of material goods and services. Participants described consumerism as a false promise that doesn't bring happiness, with one participant defining it as "thinking that that is where we find happiness, thinking that it's going to be because of that new phone or that new car, which of course is not the case at all," and another respondent explicitly stating, "I think this consumerist society doesn't make us happy." (Interview, November 17 & 20, 2021). Participants also pointed to the ecological consequences of this belief, and the way that it drives extractive resource consumption beyond what the planet can support, describing it as a cycle of "destroy, consume, destroy, consume." (Interview, November 17, 2021). One respondent identified a specific regional expression of this problem, citing the indulgent water consumption of tourists in the coastal area of Benidorm which exacerbates water scarcity in the dry agricultural regions of southern Spain. (Interview, November 17, 2021)

Following consumerism, the fourth element within the category of culture and values that emerged from the interviews is values. Participants described the values in the "mainstream culture" as problematic in two different ways. The first is related to consumerism, and the values focused on money, fame, appearance, and status, which were described as both a distraction

from and a driver of the present ecological crises. The second aspect of values is related to agriculture, and society's failure to value the work of farmers and their contribution to society as stewards of land and providers of healthy food. One respondent stated, "Overall we just don't value farmers which is completely ridiculous, because in society a farmer is just as needed if not more than a doctor or a lawyer." (Interview, November 11, 2021). This respondent also emphasized that soil is the foundation of society, that "everything relies on the quality of our soils and the quality of what we grow." (Ib id).

Two aspects of culture and values that also surfaced as problems during the interviews were individualism and a lack of community. Participants described individualism as a focus on the individual as a self-contained, self-reliant, and independent whole, a belief that is imparted onto people by a capitalist economic system: "what you're taught within the capitalist system, is that everything depends on yourself." (Interview, November 20, 2021) This individualism also fosters a competitive, zero-sum attitude towards relationships and is a product of social institutions, particularly education:

> "We are all put into this individualistic mindset from a very young age, even in schools, having to be competitive for grades, for places and scholarships and all that stuff. That is making us go against each other instead of working together." (Interview, November 17, 2021)

According to the participants, individualism disconnects people from one another and from the web of life, while limiting our ability to collaborate on commons-oriented projects that have collective rather than individual benefits, such as restoring ecosystems. Related to the problematic values of individualism is a culture that lacks community. One participant described community as a "missing level in western society," stating that western culture emphasizes the individual and household as social units, while lacking meaningful community and cohesion at larger scales (Interview, November 21, 2021). Another respondent stated that within western culture, people are not socialized to live in, build, and interact with community, and identified this cultural experience as a problem (Interview, November 12, 2021).

One additional element of culture and values that participants discussed was the relationship with oneself that develops within mainstream culture. The motif of disconnection

appeared again, with participants describing a cultural norm of disconnecting from one's feelings, empathy, and conscience. In an emotional interview, one respondent described how people are socialized to ignore cruelty and pain, especially towards animals, and how this desensitization and disconnection from empathy leads people to permit and bear the ecological destruction and human exploitation occurring today: "I think everyone knows, everyone feels it. I think also, with the cruelty towards animals. It's so difficult, you cannot not empathize. To suppress it costs so much energy, you don't know it because you've done so since childhood." (Interview, November 18, 2021). Another respondent attributed this emotional disconnection directly to a dominant cultural system: "within the system the way it is we're not really taught to access that. We're more taught to disconnect, to not feel." (Interview, November 19, 2021). From participants' descriptions, this disconnection from self appears to enable and contribute to cultural problems identified in other interviews, particularly the relationship between humans and the earth and the relationships between people. Finally, the last problem within culture and values is the lack of a collective will to act. One participant simply stated, "it's not a problem of knowing how to do it, or what to do. It's just a question of culture and deciding to do it." (Interview, November 18, 2021). In this quote, the problem of inertia and inaction is attributed directly to culture.

Land Degradation

Following culture and values, land degradation was unsurprisingly identified by participants as a major category within their diagnostic frames. Although references to land degradation appeared fewer times in the interview data compared to culture and values, land degradation was the diagnostic category that received attention from the greatest number of participants. Agriculture was by far the most prevalent causal factor that participants pointed to within land degradation, and these problems were articulated in terms of agricultural practices, agricultural policy, and the food system.

Regarding agricultural practices, participants pointed to monoculture farming, intensive tilling, and extracting groundwater for irrigating vegetables as especially problematic:

"for me, it's incredible that we have in the south south, in Murcia and Almeria, the biggest producer of broccoli and lettuce that uses a lot of water. Why base your economy on a resource that is scarce? We have a lack of water here." (Interview, November 19, 2021).

This remark was also supported by data from participant observation, as during our drive to camp from the nearest town we passed strips of bright green broccoli and lettuce covered in red plastic sheeting that contrasted sharply with the dry landscape. (Observation, November 8, 2021). During this drive one volunteer who had stayed at camp for weeks shared with our group explained that these operations would mine the groundwater to support vegetable production for a few years, and then after depleting the aquifer the operation would move to another area, highlighting the extractive model of production. Participants also highlighted monocultures as destructive, which was made apparent by these vegetable monocultures as well as the landscape in which we all lived and worked during our stay: endless rows of almond monocultures surrounded much of the camp, and several participants pointed to these fields around us as a problem, describing the fields as lifeless, lacking biodiversity, and offering no habitat for animals. (Observation, November 15, 2021). Tilling was a third practice that participants identified in interviews as a problem due to its damaging effects on soil life and its contribution to wind and water erosion. We all experienced tilling's erosive effects when we were planting next to an almond plantation and the tractor would till nearby: clouds of dust billowed upwards whenever the tractor passed, even more so when the gusts picked up, carrying the topsoil across the landscape or high into the sky (Observation, November 12, 2021).

Agricultural policies were another point of discussion in both the interviews and the conversations around camp. Over breakfast one morning, one of the long-term volunteers lamented that farmers in AlVelAl (the regional farmer's association for regenerative agriculture) and Alfonso (the owner of La Junquera) could lose their subsidies from the Spanish government for implementing regenerative practices like keyline planting, cover cropping, and minimizing tillage. (Observation, November 10, 2021). This volunteer also said that he knew farmers that plow to receive subsidies and don't even plant anything, saying that "they're just paid to destroy their land". (Ib id). This sentiment was echoed during several of the interviews, with respondents saying that farmers were disincentivized from shifting to regenerative practices, which dictated

farmers' behavior due to their reliance on subsidies: "you see here how you're subsidized to destroy the world. The problem is still a lot in policy." (Interview, November 20, 2021).

Only one participant included the food system in her diagnostic frame, referencing the political economy of agri-food systems and the way that farmers are at the mercy of commodity markets. She stated, "in many areas around the world, farming is just not profitable, just the way our food system is organized. Farmers get nothing or next to nothing for their produce." She later located this problem more specifically with supermarkets pointing out that "Europe-wide and maybe worldwide the way that supermarkets have defined what farming and prices look like, just about everything, gives the farmer a really crappy deal." (Interview, November 18, 2021).

Deforestation, desertification, and water management were aspects of land degradation that many participants discussed as problematic in the interviews. One participant stated that she had witnessed how deforestation caused changes in microclimate in Cambodia, which in turn transformed arable land into non-arable land and forced farmers to move into cities. (Interview, November 12, 2021). In the context of Spain and southern Europe, participants traced the problem of deforestation back to Roman times. (Interview, November 20, 2021). Desertification was a concern that applied to desert regions across the globe, but assumed a sense of urgency in Spain:

> "here in the south of Spain, the desertification is a massive issue that is not being addressed in any radical way by the government…more than half of Spain is predicted to become a desert by the end of this century…people are not really conscious of that, but we have to be." (Interview, November 19, 2021).

Water management practices were described as maladapted for the dry conditions of southern Spain, especially irrigated vegetable and fruit production.

Institutions

The role of institutions was a tertiary focus of the diagnostic frames during the interviews, but they assumed a much greater importance in the conversations that occurred around camp, over meals, and during the planting sessions. Three distinct categories emerged in the interviews and these discussions: the problems of the current economic system, the political system, and

the media or information system. Respondents described this problematic economic system as capitalist, industrial, globalized, and consumerist, with three participants asserting that this system was the root cause of problems because of its influence on culture and values and the coercive role it plays in forcing people to undertake work that degrades the environment (Observation, November 14, 2021). Another aspect of the economic system that emerged in conversation between participants was the way that it prevented people from contributing to regenerative projects like Camp Altiplano. During this conversation several volunteers remarked that it was a privilege to come and volunteer, that only those with the financial means to forego an income, pay to travel, and offer free labor can participate, a concern which was especially relevant to Camp Altiplano, as Murcia is one of the poorest regions of Spain (Observation, November 14, 2021). This observation was also supported by the demographics of the camp, which was comprised primarily of volunteers from outside of Spain. In addition to these specific conversations around the context of the economic system in Spain, the problems of global capitalism were often discussed around camp, and one participant observed the effects of the global economy in his interview: "I'm not against globalization, but I see that companies that are active on a global scale destroy a lot of the small communities. The livelihoods, our seedbank, many things." (Interview, November 12, 2021).

Political systems were a frequent subject of critique in everyday conversations and in the interviews. Several participants linked problems in the political systems to the concentration of economic power arising from the current economic system. For example, one participant expressed in an interview that "the big companies have a lot of money and a lot of power and always are trying to bend the law in their favor". (Interview, November 12, 2021). This problem manifested in the local context, when another volunteer accused the Spanish agricultural ministry of being "completely captured by corporate interests," which explained their failure to cooperate with and support more agroecological and regenerative initiatives and policies in agriculture. This same volunteer also criticized the COP26 agricultural session, which had happened the day before, as being captured by agribusiness, and the corporate agenda of monoculture, technological intensification, green revolution, and GMOs. (Observation, November 15, 2021). COP26 was convening at the same time as the field research at Camp

Altiplano, and participants often pointed to this as an example of the problems in political institutions:

> "We cannot wait for officials to do their jobs. Recently there was the great example of COP26 that was like the last hope of humanity, and they failed…the government and politicians agreed upon nothing, they did nothing, they've been speaking for two weeks." (Interview, November 21, 2022).

Volunteers also identified some of aspects of existing governance models as problematic, for example the way that the provincial governance boundaries are not aligned with bioregional boundaries. One volunteer explained how the Altiplano bioregion is divided such that it forms the borderlands of three provinces, Murcia, Andalucía, and Castilla-La Mancha, which creates a situation in which the needs of the regions are not understood or served by the provincial governments (Observation, November 15, 2021). Another critique centered on representative democracy:

> "we don't have to quit representative democracy totally, but many subjects cannot decided upon by chosen representatives. They will not be able to make the right decisions…It's just politics that is getting in the way of solutions, the right approaches, I think. The structure of our society, our culture, our decision-making." (Interview, November 10, 2021).

From these conversations and interviews, it became clear that political systems were an important part of how many participants defined their diagnostic frames.

References to media as a problematic social institution occurred several times in the interviews and informal conversations between participants. Participants described a media ecosystem that has an excessive focus on the negative: "we thought that we were always looking at the negative data, negative situation, negative voices, and we thought no, come on, we can promote the solutions." (Interview, November 18, 2021). This participant expressed that such a negative focus is problematic because it demotivates people to act, and inhibits an awareness of opportunities to act and solutions. The balance of focus on solutions and problems within media was a subject of contention between some of the participants, with some identifying a negative outlook as problematic, and others asserting that it was necessary to fully understand the context

of what is happening: "what I'm sometimes a little bit afraid of, when people are working on projects like this, is that they don't want to fully see the destruction part" (Interview, November 20, 2021). This tension between the grief, awareness, and frustration of loss, and the focus on solutions, progress, and optimism was a recurring pattern in many of the interactions and conversations at camp, and highlighted a diversity in the diagnostic frames.

Climate

Climate was identified as a further problem by participants, and was described in terms of global climate change, the challenges of the dry regional climate, and localized climate change. Global climate change was attributed to human activity, with indications of this problem in receding glaciers, desertification, and droughts. One participant expressed concern that climate change and desertification could lead to a future in which much of the Iberian Peninsula is uninhabitable (Interview, November 18, 2021), and another suggested that the effects of climate change in Spain now are an indicator of the conditions that the rest of Europe will face in 15 years (Interview, November 15, 2021). In addition to the challenges posed by a changing climate, participants who had stayed in the region on a longer-term basis acknowledged that the dry regional climate posed a challenge as well, even before considering any changes (Interview, November 18, 2021). Another volunteer who had witnessed deforestation and land use change during her travels across several continents commented on the problem of localized climate change, which she stated could be caused by deforestation or overgrazing (Interview, November 17, 2021). In summary, climate change was both a local and global process, which was creating problems at all scales, and which intensified the existing challenges posed by a dry regional climate.

Another key component of the diagnostic frame that emerged in the interviews was complexity, and modern society's failings in managing complexity. The theme of complexity was mentioned in four interviews and was often a part of group conversations whenever the problems of the world were being discussed. One interviewee referenced Alan Savory and his perspective on the challenges presented by complexity: "I really agree with Alan Savory here that the biggest problem is our management and how we make decisions. The biggest part of this is

that life is a complex system. It's not complicated, it's complex." (Interview, November 12, 2021).

According to this respondent, the mismatch between the complexity of the physical and biological world and the models that humans use to interact and attempt to control this world is a source of problems. Another respondent identified this same problem, describing how it unfolds across different domains in society:

> "with agriculture and a lot of other problems, I think in the last few centuries we've thought mostly about systems as an industrial machine, which we can optimize and tweak, and it's actually been quite a successful way of thinking. Of course, productivity has gone up a lot. However, the last decades, we've run into the limitations of that." (Interview, November 20, 2021).

Again and again, respondents identified a mechanistic rather than systems-oriented way of thinking as a root cause of many problems.

Other Themes

Finally, two problems that participants mentioned in the interviews that did not fall under the preceding categories were rural depopulation and energy use. Rural depopulation was highlighted as a problem in Spain, with the phrase "Empty Spain" describing villages that are mostly abandoned and aging, with no young people (Interview, November 18, 2021). Participants explained that this was due to the lack of economic opportunity in these areas, and the migration of young people to cities to find work. Energy use was underscored by one respondent as a contributor to many problems, with abundant fossil energy creating leisure time which in turn leads to greater and more resource-intensive consumption. (Interview, November 12, 2021).

Prognostic Frame
Overview

In this section, the results for the prognostic frame are presented, which responds to the second research question: "How do participants frame the proposed solutions to the problem(s)?" The table below structures the results in the same manner as the diagnostic framing results table

in the previous section, with categories and subcategories listed in order of decreasing prevalence, based on the number of times each code appeared across all interviews.

Frame	Category	Sub-category	Sub-subcategory	Total number of times code appeared across all interviews	Number of interviews in which code appeared	Percentage of interviews in which code appeared
Prognostic				356	13	100.0%
	Agriculture			66	9	69.2%
		Diversity		8	5	38.5%
		Regenerative business models		7	3	23.1%
		Short circular supply chains		7	4	30.8%
		Natural zones		5	3	23.1%
		Soil health		4	4	30.8%
		Carbon drawdown		2	2	15.4%
		Water management		2	2	15.4%
		Bottom-up farmer movement		1	1	7.7%
		Local species		1	1	7.7%
	Culture			28	8	61.5%
		Change of values		11	5	38.5%
		Way of life		6	4	30.8%
		Relationship with nature		4	2	15.4%
		Connect with self		3	2	15.4%

		Learn new skills		3	3	23.1%
		Will to act		1	1	7.7%
	Communication			26	11	84.6%
		Storytelling		19	7	53.8%
		Awareness and education		7	7	53.8%
	Community			23	6	46.2%
	Institutions			19	8	61.5%
		Government action		14	6	46.2%
		Change without revolution		3	2	15.4%
		Change economic system		2	1	7.7%
	Change by example			13	6	46.2%
	Ecosystem restoration			9	5	38.5%
	Change choice architecture			7	3	23.1%
	Manage complexity			7	3	23.1%
	Recruitment			7	5	38.5%
	Local change			3	2	15.4%
	Technology			3	2	15.4%
	Science			1	1	7.7%

Table 2: Summary of prognostic frame codes and prevalence.

Agriculture

References to agriculture appeared more than any other code in the prognostic frames, although it should be noted that more respondents mentioned communication in their

prognostic frames than agriculture. Some participants described agriculture as a key solution due to its outsized role in degrading ecosystems, with one stating that (the greatest solution lies in agriculture, because that's driving most of the land-use change." (Interview, November 12, 2021). Other respondents conceptualized the role of agriculture in terms that extended beyond its biophysical effects, exploring its role in shaping culture and mediating relationships between human society and the environment. The following quote touches on this and summarizes how agriculture is a vital element is within the prognostic frame:

> "Agriculture is the base, we will probably fix a lot of problems using agriculture as a method of life, a method of relationship, a method of seeing our environment. I think it is the sector, the tool, the critical tool for introducing this concept. Agriculture is the best one, in my opinion, because it touches everything. It's fundamental. Also, when we are talking about people, food is fundamental. So, for me, I think agriculture is key."
> (Interview, November 19, 2021)

In terms of how agriculture would positively shape the future and what it would look like, participants presented visions in the interviews that emphasized diversity, economically viable business models for regenerative agriculture, and short and localized circular supply chains. One respondent described a farming system that is "productive and biodiversity-focused," echoing others' calls for diversity in crops and life on the farm. (Interview, November 12, 2021). This goal of creating a diverse agroecosystem is mirrored in the farming systems at La Junquera and Camp Altiplano, which support rotational grazing of cows, rows of native herbs like lavender and thyme for essential oil production planted between rows of almond trees, as well as fruit trees and a vegetable garden. Integrated with these productive species are natural zones like shrubland and ponds which provide habitat for birds, amphibians, and small mammals. Respondents often referenced this diversity and integration with natural zones at Camp Altiplano in their own descriptions of the systems that they envisioned.

Economically viable business models for local, biodiverse, and regenerative agriculture were a key part of the visions that several respondents put forward. Part of this model was focusing on using ecological processes rather than inputs like machines or pesticides as an ecological and economical choice: "It is a viable solution. It's not crazy to make this transition.

And it's also cheaper, because if you are a wasting a lot on machines or pesticides, you are also going to save some money." (Interview, November 18, 2021). Another aspect of this business model highlighted by a respondent with expertise and experience in agri-food business was adding value through enriching ecosystems and seasonal production,

> "Europe cannot compete in production with other countries. We have to bet on the added value, and the added value is to have super healthy ecosystems, and to eat fruits and vegetables when they are in season" (Interview, November 19, 2021)

This same respondent also stated that rural crafts and artisans would contribute to added value, that regenerative certification would be needed to realize the added value of healthy ecosystems, and that there was a clear need for more examples of business cases in regenerative agriculture (ib id). He highlighted the value that AlVelAl's models have created in regenerative almonds and regenerative olive oil, products which were offered during the picnic breaks during the *bellotada* (acorn gathering) organized by AlVelAl's reforestation program. The volunteers and I had a chance to sample the regenerative almonds during this picnic, and to document the product's labeling advertising its status as a regenerative product.

The label reads:

> Toasted "Largueta" almonds, regenerating soils and landscapes…This product is the fruit of an initiative that restores degraded landscapes in southeast Spain, created in 2014 in collaboration with the Dutch foundation Commonland and the AlVelAl association. These

almonds are the traditional "Largueta" variety, raised as rainfed regenerative agriculture of high quality and nutrition.

Complementing and enabling this shift towards economically viable regenerative agriculture is the re-localization of food systems. Respondents listed several advantages of this localization, including re-establishing feedbacks between one's consumption and the effect it has on the broader world, creating a more resilient and self-sufficient system, and shifting from the self-terminating linear model of extraction, production, consumption, and pollution towards a regenerative circular model (Interview, November 12, 18, 20). One respondent suggested that re-localization would translate to a European food system, with produce being shipped by train across the continent, and that people would have to adjust to consume only that which is produced in Europe and in season (Interview, November 19, 2021).

Figure 7: Regeneratively produced almonds with explanatory label.

Soil health was another common theme in respondents' prognostic frames, as it supports biodiversity and plant health while sequestering carbon (Interview, November 12, 2019). Several participants described the importance of managing water using water harvesting techniques such as the swales and ponds on the property (Interview, November 12 & 18, 2021). Finally, two further aspects that were mentioned once each in the prognostic frame were the importance of regenerative agriculture as a bottom-up movement of farmers rather than a top-down imposition of government authority, and the importance of local species in agriculture and restoration efforts. (Interview, November 16 & 20).

Culture

In addressing the need to change mainstream culture, six areas emerged: values, way of life, relationship with nature, relationship with self, new skills, and will to act. The positive values that participants articulated in interviews were compassion (for people, animals, and the earth), responsibility for one's actions, generosity, and gratitude (Interviews, November 10-21 2021). In describing a better way of life that society should move towards, participants emphasized greater contact with the outdoors, and made a positive comparison with aspects of rural life at camp such as walking a trail between buildings with views of mountains and fields, relying on rainwater catchment systems for water needs, and using renewable energy produced on-site. (Ib id). Common qualities of the ideal relationship between humans and nature that participants listed were cooperation, compassion, sensitivity, integration, unity, and trust (ib id). Respondents described a similar need to reconnect with oneself, with one respondent stating that people need "to get in touch with, first, themselves, their hearts, their bodies, what's going on, because we have a lot of wisdom inside of us, all of us." (Interview, November 18, 2021). The will to act was described in simple terms as a decision that needed to be made to act and implement the solutions that are already available (Interview, November 12, 2021).

Communication and Education

Among all the strategies for change, communication was the one that was shared by the most participants and was framed in two distinct ways: storytelling and education. Based on the descriptions of participants, storytelling concerns the way that current and historical events are interpreted, and how this interpretation shapes the scope of possibilities in the future. Several volunteers shared how hearing a positive story of ecological restoration and regenerative agriculture during the era of climate change and ecological crisis inspired them to act (Interview, November 12, 16, & 21, 2021). These participants also highlighted the important role of these stories in mobilizing others, citing documentaries on regenerative agriculture and ecosystem restoration such as "Green Gold" or "Kiss the Ground" (Interview, November 12, 16, & 21, 2021). One participant shared his perspective, stating that "what I hear now is a completely different narrative than what I have ever seen anywhere in the press or in the mainstream press, or the

information that comes to an average person." (Ib id). Another participant described her interpretation of the mainstream story that needs to change, and how it limits the public's perception on what is possible: "Another more mental thing, is that a lot of people are losing hope, so they think, 'This is just the way it is, and there's nothing we can do about it'" (Interview, November 18, 2021). Much of this storytelling also centers on deeper and often unspoken assumptions about human nature, human purpose, and humanity's relationship with the earth: "Every animal has its own thing to do in this world, but we can finally realize our position here on this planet. We are not here to destroy it, we are here to create, to regenerate" (Interview, November 17, 2021). Embedded in participants' stories of regeneration was the assertion that humans belong on earth, and that humanity is not a cancer, but rather a member of the biosphere that is still discovering its role.

Many participants articulated a need to change the stories by which society operates, and while there was significant support for more positive mobilizing stories, there were also voices that cautioned against excessive optimism, emphasizing the need to confront the gravity of mass extinctions, climate change, and the titanic industrial forces driving these processes. One respondent emphasized the need for those planting trees to respect the activists that are raising awareness of ecological destruction, agitating for change, and standing up to extractive industry by blocking pipelines. She also stated that the regenerative movement must recognize that regenerative efforts and the struggle against extraction are "the same battle," and urged those involved in restoration to acknowledge that other environmental activists' stories and experience of ecocide are also valid and important.

She explained,

> "What I think is necessary is to have diversity of tactics, and to work together. So, for people who are planting trees, to realize and support the struggle for life, and to realize that we're a part of that here, and to support people who do that in a different way…I would love to see more awareness of the fact that we're actually fighting the same battle." (Interview, November 19, 2021).

Alongside changing stories, participants described a need for education and raising awareness, but acknowledged that it would be a long-term investment. The educational strategies that were

touched upon included training local educators in restoration, providing experiential learning for students of all ages, offering courses for adults, and working with farmers, all of which were projects in progress at Camp Altiplano and La Junquera. In terms of the timescale for results, one participant said that the impact would appear in a minimum of 10 years, and that the process would be a gradual shift (Interview, November 18, 2021). Another participant described the value of education in terms of disseminating techniques and a systems-oriented way of thinking:

> "I think the importance of Ecosystem Restoration Camps as a movement is connecting people to other people and connecting people to the land and the land management, and the techniques and way of thinking. So it's very important as an educational opportunity for people. Most people that come here at camp also do the after-school projects, which I think are great" (Interview, November 15, 2021).

This reference to interpersonal connection and learning is a fitting description of the experiential and peer-to-peer learning that takes place at Camp Altiplano, which is described in greater detail in the section below.

Community

Community was a common theme throughout many of the prognostic frames that participants described. Several participants envisioned more community-oriented ways of living, which would provide people with a greater sense of fulfillment and connection to nature while improving the resiliency of society amidst the uncertainties of climate change:

> "I think I want to emphasize again that for me, it really is a lot about community. I think the eco-crisis is something that can only be managed if we all want to not only do it for ourselves, but also the people around us and that community building in that regard is essential." (Interview, November 20, 2021)

Another participant emphasized the role of community in adapting and learning:

> "A lot of people have mentioned the community thing. I have come to realize that working on your own on something is not sufficient. And also you can't learn very efficiently on your own, either. There are so many people that have so many interesting things to share, so learning is also a community effort." (Interview, November 20, 2021).

This description of social learning in community aligned with my own experiences at Camp Altiplano, and the experiences of others that I observed there. Throughout the day, whether it was preparing or eating meals together in the kitchen, planting trees, or gathering native seeds while hiking in the forest, there was a constant exchange of knowledge. For example, one participant had a deep passion for and knowledge of the local species and taught us all how to identify species, to tell when their seeds were ripe for collecting, and how to prepare them for planting. Other campers shared knowledge about adjacent social movements such as Extinction Rebellion and the political demands for alternatives to representative democracy like citizens' assemblies. A returning camper that had designed and installed the camp's solar electrical system taught us how the system functioned, and how it could be improved. In this sense, Camp Altiplano was a living example of a community of learning, and how this system elevates collective knowledge on restoring ecosystems, improving social systems, and mitigating and adapting to climate change.

Institutions

Institutions were another topic of discussion that attracted attention in both the interviews and the group conversations at Camp Altiplano. There was a diversity of perspectives, with some participants believing that certain institutions should be maintained to provide stability for regenerative work, while others believed that meaningful and systemic regenerative action was impossible without fundamental changes to many of society's institutions. One participant described the need to maintain stability, stating that,

> "there is an existing system, we don't need a revolution…it would be a positive development to use the existing capitalist system, which, I'm not going into political discussions, but until now, the system that we have, is the system that has worked the longest, the best" (Interview, November 19, 2021).

An opposite view was expressed in another interview, with the participant arguing that,

> "as long as we have this system of capitalism—a trade-based society where in order to get something we have to trade—then it's always going to be like that… I think we have to transition away from this society" (Interview, November 17, 2021).

Another participant reinforced this need to change different social institutions, stating:

> "The current structures and systems have to be disrupted and dismantled, because the destruction has to stop, if it continues you can do a lot of really nice things next to it, but it's not going to be enough, it's never going to be enough." (Interview, November 19, 2021).

These perspectives represent poles in the continuum of opinions around economic institutions expressed at camp, but the group conversations presented the impression that many of participants were highly critical of capitalism and social institutions and that many believed that they needed to be changed in fundamental ways.

Participants frequently discussed political institutions, although there seemed to be greater agreement in the positive role that governments would play compared to the differing perspectives on economic systems as described above. Two participants predicted that governments would make important contributions to large-scale restoration efforts, with one stating this would likely happen as a result of successful pilot projects: "sometimes you need one successful project and then the governments are interested and want to replicate it" (Interview, November 13, 2021). The other participant predicted government action would arise as the idea of restoration diffused throughout society: "through all the connections of humans, will also lead to a broad-scale restoration by governments. But it might take a few decades still to get it going" (Interview, November 10, 2021).

Yet another theme in this conversation around political institutions was the need to modify representative democracy, for example by establishing citizens' assemblies to make decisions and oversee the process of decarbonization: "we need democracy, but we need a different kind of democracy" (Ib id). Several participants were familiar with the concept and history of citizens' assemblies because of their involvement with Extinction Rebellion, which calls for citizens assemblies as one of its three core demands. During mealtime conversations these volunteers shared their knowledge of citizens' assemblies as an alternative or complement to representative democracy, which attracted the interest of other participants as a possible response to the governance failures that were identified.

A theme that many participants touched on was the power to change by example, which participants described as operating at the scale of individuals, farms, and nations. In this prognostic frame, by engaging in restoration activities, volunteers can inspire others to participate:

> "I would say ecosystem restoration camps and ecosystem restoration like this is actually more of an inspirational thing. Really important, but too small to change the world. But it can inspire others, it plants the seed in the head of many others." (Interview, November 12, 2021).

Several other volunteers were intentionally leveraging this potential to influence others. Two volunteers who had founded the association A Regenerar (Let's Regenerate) filmed many of the restoration activities to promote ecosystem restoration and regenerative agriculture for their social media campaign, and another volunteer attended camp with filming and promoting restoration online as one of his main rationales for coming to camp. Camp Altiplano and La Junquera were also identified by several volunteers as an example that inspired other farmers to change. One respondent shared a story from when Camp Altiplano was first implementing keyline design, and the skepticism that some of the neighboring farmers expressed towards the planting and tilling in curved lines. This initial skepticism was followed by interest after farmers saw the resulting improvements in soil quality, demonstrating how Camp Altiplano is acting as an example and influencing farmers' perceptions of unconventional and regenerative farming techniques (Interview, November 17, 2021). The dynamic of change by example also functions at the scale of nation states, as one respondent alluded to:

> "What happened already in certain places in the world—Rwanda as an example, Ethiopia, or other regions of the world where big projects have been done—the governments get curious about what is happening here." (Interview, November 20, 2021).

In the quote above the respondent is referring to large-scale restoration projects implemented by governments, and how these examples influence other governments to envision and implement similar types of actions.

Ecosystem restoration was another component of the prognostic frames that respondents described in interviews. Participants described healing the earth and recovering ecosystem health to a reference point, with one participant envisioning: "a safer future for our species and other species and the ecosystems that are being depleted, damaged, or undermined." (Interview, November 19, 2021). A similar vision emerged in other interviews, with descriptions of more greenery and vegetation, and using local adapted varieties of trees instead of non-native plants. Part of this vision is also restoring land as a commons that all can benefit from and enjoy: "the land, let's restore it, it will be free for everyone and there will be beautiful trees and birds and nature." (Interview, November 20, 2021). This vision of ecosystem restoration encompassed reforestation and integrating agricultural production with natural ecosystems (Interview, November 18, 2021).

In terms of how this aspirational world would be achieved, one participant offered an approach informed by Alan Savory's model of holistic management. He stated,

"Complex systems need a totally different approach, they need management and observation and continuous readjustment of management. You have to know a lot and really work holistically not reductionistically. Everything needs to be accounted for and you have to think about all the aspects and all the participants including all the animals, plants, and microbes, they're all there at the table." (Interview, November 12, 2021).

This respondent also highlighted natural complex systems' ability to quickly recover, suggesting that with the right approach and conditions these systems could enable rapid restoration.

"We killed it but we can restore it actually quite fast. The microbes are the most important, and you can get those working 80% in just a few years. And then if you do it right you have all the creatures in ground, they just come back and start working… The biology is there, that's the main technology. There is no better technology than that. Also, because the living world is complex and this is the solution nature has for it, is all these living creatures working together creating something that people cannot imagine. We cannot create it. Luckily, it's already there." (Interview, November 12, 2021).

This perspective reiterates two themes that permeate many of the prognostic frames: the need to foster a cooperative rather than exploitative relationship between humans and ecosystems, and the need to work towards the a regenerative future by managing complexity with a holistic, systems-oriented mindset.

Other Themes

In addition to the prognostic elements listed above, there was an assortment of secondary themes that received some attention in the interviews that are briefly mentioned here. Many of these themes overlap with and are related to those discussed earlier in this section. One necessary change that participants envisioned was a radical shift in the pressures and contexts that dictate individual choices. Participants attributed consumerist and ecologically destructive choices to be a product of the social and economic environment in which people live, with suggestions for change ranging from "a larger safety net so people can work less" to Universal Basic Income (Interviews, November 20 & 21, 2021). In the latter, more radical suggestion of a Universal Basic Income, the respondent explained,

> "If your mind is not busy with providing for your basic needs or collecting money to gain access to some things like cars, travel, etc…people will have more time and ideas on how to contribute to society…There would be no point in becoming rich, no competition between each other, there would be more initiatives to do something good, to restore the ecosystem, to study how we're all interconnected with nature." (Interviews, November 21, 2021).

The final themes within the prognostic frame are the need to recruit more people to participate in restoration, center change at the local scale, and leverage technology and science. These themes were presented in some of the related prognostic frame sections above and so are only mentioned here for brevity.

Motivational Frame
Overview

Here the results for the motivational or action frame are presented, which responds to the third research question: "How do participants frame their rationale for engaging in collective action?" The data are structured in the same format as the preceding sections, starting with the categories that received the most mentions and continuing down in descending order.

Frame	Category	Sub-category	Total number of times code appeared across all interviews	Number of interviews in which code appeared	Percentage of interviews in which code appeared
Motivational/Action			184	13	100.0%
	Efficacy		33	13	100.0%
		Goal recedes onto horizon	2	2	15.4%
		Unsure how to solve	1	1	7.7%
	Enjoyment		24	9	69.2%
	Propriety		12	5	38.5%
		Caring about animals	3	3	23.1%
		Caring about environment	2	1	7.7%
		Justice	2	2	15.4%
	Urgency		12	7	53.8%
	Seeking community		11	5	38.5%
	Learning		2	1	7.7%
	Severity		2	2	15.4%

Table 3: Summary of prognostic frame codes and prevalence.

The most frequently discussed part of the motivational frame was efficacy. Many participants expressed conflicting feelings about the efficacy of their actions and the movement as a whole. For two participants, this was because the idealized goal of the future was always receding on the horizon and because change is gradual:

> "probably these things you can see them in a conceptual way, but if you actually reach the point, then you never actually understand that you've reached it, because you grow into it so slowly. You never think you've arrived because it's very far on the horizon…there is somewhere you want to go but it's not somewhere you can actually reach" (Interview, November 10, 2021).

At the same time, this participant acknowledged that even though the goal might never be achieved, that the process of moving towards it would still provide "enormous benefit". (Ib id). Another respondent described a similar dynamic using a more direct comparison with restoration and tree planting:

> "We will see the change, but we will never see the outcome. You know, a tree takes hundreds of years to grow, but we will see the change. We will see a lot of disaster, but we will also see the change." (Interview, November 13, 2021).

These two quotations highlight how participants recognized that action in restoration is effective, but that there is a considerable time delay before the results appear. Another aspect of this framing is how efficacy is conceptualized as more of a process than a discrete goal or desired end-state. A second qualification of restoration efficacy that one participant expressed is that he simply didn't know how to make the restoration movement effective: "It's a big search on how to do this, and I don't have the answer on that." (Interview, November 10, 2021).

In reflecting on the efficacy of their actions during the interviews, many respondents also discussed the sense of personal empowerment that they experienced through their actions in restoration: "That's the reason why I went into ecosystem restoration, I thought, 'I can do something'" (Interview, November 19, 2021). This sense of personal efficacy was also framed by some in comparison to the perceived lack of efficacy other actions, particularly actions that attempted to influence institutions:

"It's better to come to this camp and plant trees and do something than demanding something from the corrupt governments of each country who just care about their own populist agenda and their silly wars they're fighting one country with another…I think every individual person is capable of doing a lot of things" (Interview, November 20, 2021).

This perspective affirming the efficacy of individual action was in tension with the acknowledgement of the scale of ecological destruction, and how it far outweighs any restoration that an individual or small group could accomplish. The same respondent quoted directly above expressed this tension forcefully:

"Yeah, look. We're here, 10 people? 15 people? We're planting 100 trees a day. So the goal is to plant 10,000 trees a year. At the same time, millions of acres of trees will be cut down and damaged. So it's a drop in the ocean. The drop is important to inspire others, and we have to do something, but if you look at the statistics, it's not going to help much. The mainstream is there, the mainstream is to cut trees, plant the monoculture, do the palm oil, cut the Amazon rainforest. That's the mainstream." (Ib id).

He also conceptualized the efficacy in restoration primarily as a catalyst for social change:

"Unless we change the values in society, everything else is patchwork. So that's why I'm here, to try to change values through my videos, to inspire more people to go out and do something instead of going shopping." (Ib id).

This respondent's pessimism on the potential of individual action to meaningfully shift the balance from destruction to restoration was accompanied by a deep pessimism on the ecological future of the planet. When asked whether he was optimistic humanity would be able to reverse course, he stated: "No…Not optimistic at all." (Ib id). Despite this pessimism, the respondent was committed to engaging in restoration and growing the movement as much as possible, stating that regardless of the outcome and unlikely odds of success, "we have to try and do our best." (Ib id). This interview is quoted at length because it is representative of some of the tensions that emerged within the motivational frames at camp. Another expression of this tension articulates how the efficacy of the regenerative movement is contingent on the success of other disruptive social movements:

"The current structures and systems have to be disrupted and dismantled, because the destruction has to stop, if it continues you can do a lot of really nice things next to it, but it's not going to be enough, it's never going to be enough." (Interview, November 19, 2021).

In summary, participants often saw their actions in ecosystem as effective, but the way they conceptualized efficacy was varied and limited. Some saw the efficacy of restoration in terms of inspiring others to change rather than the direct benefits of restoring land, while others recognized that their actions would only be effective if the larger forces driving destruction were halted.

Enjoyment

One of the simplest and most common reasons that participants spoke about in explaining their involvement with ecosystem restoration was that it was enjoyable. This enjoyment was described in different ways, with one participant noting that he enjoyed the work and time outside: "Another reason is that it's nice to do this. It's nice to be here and to help out. Nice weather." (Interview, November 12, 2021). Another participant explained that she enjoyed learning and connecting with the biodiversity of the area: "I really liked learning about native species, seed conservation, seed harvesting, and propagation of plants, and just getting to know the landscape and appreciating it." (Interview, November 12, 2021). Yet another form of enjoyment that participants listed was the sense of community and enjoying the company of others engaged in restoration (Observation, November 19, 2021). This enjoyment and the sense fulfillment from the experience was a strong driver for many of the participants and was evidenced by the frequent smiles and laughter throughout the days at camp, and the fact that several of the campers were returning for their second or third time.

Propriety

When asked about their reasons for participating in ecosystem restoration, many campers referenced their compassion for the environment, animals, women, minorities, and vulnerable populations. These explanations often relied on a sense of moral propriety, and the

duty that those with power and privilege have to protect those who are at risk of harm, specifically due to climate change and ecosystem degradation. One respondent expressed her concern,

> "Privileged people like myself are going to still live for quite a long time, but especially minorities, especially people in poorer regions of the world, people who are living in dangerous areas where there can be a lot of issues with water or desertification, I really think that these people are already suffering and are going to suffer a lot more very quickly." (Interview, November 20, 2021).

Alongside the direct expression of compassion as a motivating force, a latent theme within this reasoning was a sense of justice. These moral considerations were reasons that strongly motivated many of the participants.

Urgency

A sense of urgency emerged in the interviews as a force that drove participants to act and engage in ecosystem restoration. This urgency was described in regional terms with the ongoing desertification of Iberia, and in global terms with climate change (Interviews, November 12, 18, & 20). In describing the urgency of climate change, one participant stated,

> "I am nervous about the future, and there's this number that is very much engraved in my brain, which is that in 11 years the rise of the temperatures will be irreversible, and that if we do not get our act together then basically from there on there is no fixing it anymore…the fact that I will only be in my 30s at that point makes me think that it's not enough time, it makes me think that we're not going to make it." (Interview, November 20, 2021)

This quote expresses a strong sense of global urgency in the climate crisis, which later in the interview takes a more personal tone, and translates into a sense of urgency to act:

> "I care so much because I feel the urgency, especially as a young person. I still want to live my life, I still want to be able to spend those years the way that I want to. And in a sense I feel urgency to do it." (Ib id)

Many other participants expressed a similar sense of urgency regarding the climate and ecological crises and pointed to this time sensitivity as a reason for their actions.

Community

During the interviews, five respondents listed finding community or meeting people as one of their reasons for joining the ecosystem restoration camp. (Interviews, November 10-21, 2021). For some, this was a curiosity and desire to see how living in a more community-oriented space would be and to discover both "the upsides and downsides" (Interview, November 12, 2021). Another participant traveled to camp to "connect with like-minded people," stating that she sometimes felt like an outlier due because she held beliefs that differed from the mainstream. She also reflected on how her experience at camp fulfilled this need for community that drew her to join:

> "One thing that's interesting about this camp is that it feels like a bit of a hub for people to connect and for people from different countries and interests and backgrounds to connect and exchange ideas and I think that's something that is quite powerful…For me that was something that was really positive."

This sense of community was also apparent in the conversations and friendships that were shared by many of the participants during the days and weeks at camp.

Learning

Another key motivation for some of the participants was a desire to learn, both out of personal interest and as preparation for future projects. This learning centered on the social systems supporting restoration and the techniques for restoring land. One participant cited the model of regenerative farmers' association, AlVelAl, stating that she came to camp "to understand how AlVelAl works, to copy it and do it somewhere else." (Interview, November 19, 2021). This respondent and others also expressed a desire to learn restoration techniques, and to learn in a more general sense from the other volunteers that came to camp.

Several respondents explained their participation in ecosystem restoration by pointing to the severity of the ecological and social problems involved. For some, this was conceptualized in terms of the positive feedback loops of climate change, which would lead to the runaway destabilization of the system and ecological collapse. (Interview, November 21, 2021). Another participant reasoned that the severity of the climate crisis meant that investing in regenerative agriculture and ecosystem restoration now would save many lives in the future (Interview, November 18, 2021). The irreversibility of climate change and the way that desertification would make much of Spain uninhabitable were further points that described the severity of the problems and the need to act (Interview, November 21 & 12, 2021). Overall, participants seemed to be in agreement that the problems ecosystem restoration sought to address were severe and that this contributed to their motivation to act.

4. Discussion

Limitations of Research

There are several limitations that apply to the research, the first of which being the researcher's lack of experience, both in conducting a case study and using participant observation as a data collection method. A second limitation is the relatively short duration of the field work. The immersive two-week period did offer a substantial body of data for research, but this could have been strengthened with a longer stay, which also would have enabled the research to include interviews with more participants as new campers rotated in.

Perhaps the most significant limitation was that some key stakeholders were excluded from the case study. Alfonso Chico de Guzman, the owner of La Junquera and the land Camp Altiplano is situated on, was overseas when the thesis field work was conducted, and his perspective would have greatly contributed to the richness of the case study. His decision to establish an ecosystem restoration camp at La Junquera and his participation with AlVelAl illustrate that he is an important node within the restoration movement in Spain. Omitting interviews with local farmers and especially members of the association AlVelAl also limited the

study, as these stakeholders likely have a greater influence in restoring ecosystems and land management decisions than the volunteers who were mostly visiting for short periods. Four of the interviewees were at Camp Altiplano or La Junquera on a long-term basis (the camp manager, the employee of La Junquera's Regeneration Academy, and the two founders of A Regenerar), but the rest were short-term volunteers. Although the field work did involve interacting with some AlVelAl members during an acorn collecting event with AlVelAl's reforestation program, the group setting, language barrier, and brevity of the activity made it difficult to establish a rapport or conduct any interviews.

Validity and Reliability

Construct validity was strengthened in the design of the case study through measures that: 1) matched the construct to the research objective and 2) operationalized the concepts being studied according to methods consistent with those in the published literature (Yin, 2018, p.44). In case study research, it is important to use specific concepts that are related to the research objectives of the study (ib id). Because Snow et al.'s framing perspective was developed to understand participant motives, mobilization, and recruitment, it is well-suited to the thesis research objective of investigating participant motivation in ecosystem restoration (Snow et al, 2014, p.26). Collecting data on these constructs was operationalized by modifying Ketelaar's three survey questions to create an interview guide (2014). Analyzing the data according to these constructs was operationalized by creating codes based on Benford & Snow's definition of diagnostic, prognostic, and motivational frames (1988). Construct validity was further enhanced by utilizing multiple sources of evidence, i.e. interviews and participant observation (Yin, 2018, p.44). Construct validity could have been improved by having key informants review a draft of the case study and making revisions according to their feedback (ib id).

One of the issues that Yin describes relating to internal validity is causality, which concerns whether the research findings offer an accurate explanation of the reasons that an event happens (ib id). The framing approach underpinning the thesis research assumes that beliefs (or frames) are what cause individuals to participate in collective actions (Snow et al, 2014), an assumption that was validated by the explanations offered in the interviews. However, there may be

additional reasons motivating participants' engagement in restoration beyond what they shared in the interviews, perhaps because of how the information and consent form primed interviewees to modify their responses or due to drivers of behavior that they did not reveal or were not conscious of.

In considering the external validity or analytic generalizability of the results, comparisons to other scholarship in social movements provide support for the generalizability of the findings. Tomblin points to a study of volunteers engaged in restoration in the US and how they found their labor to be a way of "gaining a closer bond with nature" and reversing ecological problems (2009, p.193), sentiments which resonate with the findings of the present study and support their generalizability. Similarly, the categories of motivational frames in the study (e.g. efficacy, severity, etc.) also aligned with prior research (Benford, 1993), another indicator of external validity.

The reliability of the study was strengthened by documenting the case study procedure such as the interview guide, field note protocol, and data analysis process. Despite these measures, there were aspects of the case study that were dependent on the unique personal relationships that developed between the researcher and each study participant over the course of the field work. These relationships influenced each interview, as prior conversations that happened outside of the interview were often referenced in the interview, highlighting the impossibility of perfect standardization and replicability of semi-structured interviews, and the elusive nature of complete reliability in case studies (Yin, 2018, p.46).

Relevance to Restoration Ecology

The research questions in this thesis ask how participants in ecosystem restoration frame the problems and solutions in restoration and why they choose to participate. In the results section above, these research questions are answered descriptively, but now that the frames have been described and presented, what do they mean? How do these frames converse with the fields of restoration ecology, social movement studies, and agroecology that inform this thesis? How can these findings be generalized to the ecosystem restoration restoration movement? And, more practically, what do these frames mean for the ecosystem restoration

movement as a whole? In the following sections, answers to these questions are explored by drawing on relevant discussions and frameworks from published literature.

Reviewing the way that participants framed the efficacy of restoration reveals a tension that exists in both the ecosystem restoration movement and the discipline of restoration ecology. On the one hand, many participants were inspired by the possibilities offered by ecosystem restoration to return biodiversity to ecosystems and reverse climate change by sequestering carbon. They viewed stories of successful restoration as evidence of the efficacy of their actions and the restoration movement. Many also highlighted a need to communicate this uplifting narrative to motivate people to act amidst the overwhelming and paralyzing deluge of negative environmental news. Other participants emphasized the need to "fully see the destruction," expressing concern that focusing too much on restoration could lead to a willful ignorance of the reality of ecocide and the fact that ecological destruction far outweighs all restoration (Interview, November 19, 2021).

A version of this tension also exists within restoration ecology, where some have criticized the field for overstating the potential of restoration and creating a Faustian Bargain that permits the destruction of ecosystems (Maron et al, 2015). This bargain, implemented in the form of net-zero biodiversity loss policies, operates under the assumption that biodiversity loss can be offset by restoring ecosystems at another location or at a future point in time. Maron et al's criticism argues that restoration can rarely, if ever, fully reverse biodiversity loss and restore ecosystem function to match the reference ecosystem, pointing to surveys of restoration projects that suggest restoration is successful only 20-50% of the time (Maron et al, 2015, p.143). In "The Myths of Restoration Ecology," Hildebrand et al. express a similar concern in articulating what they call "the myth of the Carbon Copy," the mistaken notion that ecosystems can be perfectly recreated after being disturbed or destroyed by human activity (2005, p.3). These points serve to underscore the importance of conservation, the irreplaceability of intact ecosystems, and the risk of overzealous development licensed under the promise of 'deforest now, restore later'.

The interviewee quoted in the preceding paragraph expresses a version of this perspective in the way she frames the efficacy of the restoration movement and the need to struggle to protect life. She emphasizes that the actions and uplifting narratives of the restoration

movement should not undermine or ignore what she calls "the struggle for life," or the struggle against the dominant systems and institutions that are driving mass extinction. Instead, the restoration movement should embrace its allies that struggle to protect life and fully acknowledge the gravity and irreversibility of mass extinction and climate change, even as the restoration movement strives towards realizing its regenerative potential. In other words, regeneration is necessary but not sufficient, and those involved in restoration should not overestimate the regenerative capacity of biological systems to the point that they neglect to protect those that are intact. The emphasis on this tension between regeneration and extraction within the case study results suggest that conflicts around net-zero biodiversity loss in the field of restoration ecology may be generalizable to the ecosystem restoration movement as well.

Relevance to Social Movement Studies

In comparing the results to Benford & Snow's empirical research and framing theory, several insights emerge. Firstly, the four categories that Benford & Snow used for classifying diagnostic frames in the nuclear disarmament movement (moral, economic, political, and technological) aligned only partially with the diagnostic frames that emerged in the research data on the ecosystem restoration movement (1988, p.200). This suggests that the way problems are defined varies across movements, and may even be unique to each movement. However, when comparing the action frames to Benford's four "vocabularies of motive" (efficacy, propriety, urgency, and severity) in the nuclear disarmament movement, these categories did describe many of the reasons provided by participants, suggesting that there may be motivating forces that are common across social movements, or at least forces that are common between the nuclear disarmament and ecosystem restoration movement. (Benford, 1993, p.195). There were two additional categories of motivational frames in the present study that did not appear in Benford's study: enjoyment and community. This could be attributed to the differences between the two types of activism and the contrast between the confrontational experience of agitating on the street for anti-nuclear legislation versus camping and planting trees in a more relaxed community setting.

Another area where the results of this study interact with existing theory and empirical research is in the motivational frame of efficacy, whereby participants engage in a social movement because they perceive their actions to be effective (Snow, 1993, p.204). Empirical social movement research supports the assumption that "mobilization depends on shared beliefs that collective action will produce the changes desired" (Snow, 1993, p.204), however this was only partially supported by the data in this study. Several participants did state that they engaged in ecosystem restoration because they saw it as an opportunity to make a meaningful contribution towards reversing ecological and climate collapse, either through the physical effects of their actions or the influential ripples these actions would create in society.

At the same time, others expressed doubts about efficacy and were pessimistic that anything could be done to meaningfully influence the bleak future ahead. For example, one respondent stated that the collective actions they were taking at Camp Altiplano were "a drop in the ocean," while another stated, "on the less happy days, I feel the urgency, but I don't feel like it's feasible" (Interviews, November 19 & 20, 2021). Despite these beliefs in the futility of collective action, both participants still chose to contribute to ecosystem restoration anyways. This apparent contradiction between climate fatalism and the decision to participate in ecosystem restoration is at odds with findings that mobilization is dependent on the belief that collective action will achieve the desired outcome (Snow, 1993, p.204). This underscores the need for further empirical study to understand the relationship between efficacy frames and mobilization and to inform effective frames for mobilizing participation in ecosystem restoration and environmental activism more broadly.

Relevance to Agroecology

The results above illustrate that the diagnostic, prognostic, and motivational frames used by people involved in ecosystem restoration were diverse, yet within this diversity there were common themes. For example, culture, values, ecosystem degradation, institutions, and climate were identified as problems by many of the participants. One way to interpret the significance of this set of common themes as a whole is through the coevolutionary model of development introduced by Richard Norgaard, which he proposed as the epistemological foundation for

agroecology in "Agroecology: The Science of Sustainable Agriculture" (Norgaard & Sikor, 1987, p.21). Norgaard's model of coevolution conceptualizes socioecological systems as a set of five interdependent parts comprising knowledge, values, technology, social organization, and a biological system, all of which feedback into and exert a selective pressure on one another, together forming a whole socioecological system (Norgaard & Sikor, 1987, p.25). Social and ecological outcomes are thus a product of the interactions between social systems (knowledge, values, technology and social organization) and ecological systems.
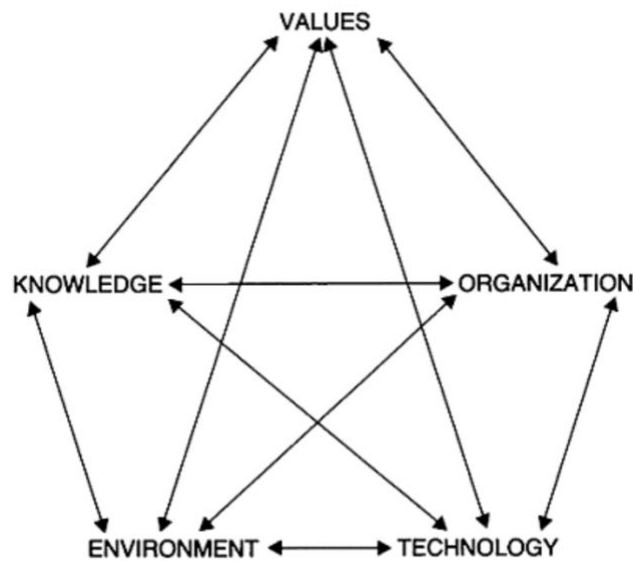

Figure 8: Diagram of the Coevolutionary process (Norgaard & Sikor, 1987, p.25) Each of the arrows represents feedback processes and selective pressure between the five subsystems.

Many participants attributed ecosystem degradation to culture, values, and institutions, a perspective which is aligned with Norgaard's coevolutionary model and its recognition of the influence of social systems on socioecological changes. These components within participants' diagnostic frames can be mapped closely onto the social systems in Norgaard's model: the 'culture and values' and 'institutions' categories from the results correspond with the coevolutionary model's values and social organization systems, respectively.

Furthermore, the fact that many participants observed land degradation and climate change, identified these changes as problematic, attributed causality to social systems, and then actively worked to change these social systems is an example of coevolution in action. Many of

these participants are working to apply this selective pressure by influencing the values, stories, and organizations in society through engaging in activism, promoting communication, and modeling behavior that regenerates biological systems. These results highlight how changes in biological systems are feeding back into the social systems and exerting a selective pressure that is pushing social systems to evolve.

Changes to values are then feeding back into technology, knowledge, social organization, and the environment. AlVelAl exemplifies these feedback processes in their work supporting farmer training in regenerative agriculture (knowledge), deploying alternative technologies in the form of agroecosystems (technology), operating a farmer cooperative (organization), and reforesting land (environment). In summary, the way that participants described problems and solutions in cultural and ecological terms are empirical evidence supporting Norgaard's model of coevolutionary development. This model is also supported by observations of the ecosystem restoration movement at Camp Altiplano, and its efforts to influence knowledge, values, technology, social organization, and the environment. The application of the coevolutionary model to this case study is another way that the case study findings can be extended to other contexts through the process of analytic generalization.

In addition to the results' alignment with the coevolutionary model of development, there are several philosophical tenets of agroecology that are woven into the frames articulated by the study participants. These principles can be seen most clearly by comparing the flawed paradigm described in the diagnostic frames with an agroecological paradigm described in the prognostic frames. Participants describe in the flawed paradigm an approach that sees and treats the world as an industrial machine and that does not account for complexity. In the desired paradigm described in the prognostic frame, participants emphasize a holistic, systems-oriented approach that accounts for complexity, emergence, unpredictability, and non-linear change. The above critique of the first paradigm and the necessity of the second is often included as part of the fundamental theoretical framework of agroecology (Vandermeer & Perfecto, 2016). This suggests that the branch of the ecosystem restoration movement captured in these frames is also at its core an expression of the agroecological movement.

Another example of the alignment between participants' frames and agroecology can be seen in the dichotomy between modern science and agroecology proposed by Norgaard, and how this dichotomy parallels the problems and solutions described by participants. Norgaard contrasts these two epistemological paradigms in terms of their premises, comparing the atomism, mechanism, universalism, and objectivism of the modern scientific paradigm with the holism, contextualism, subjectivism, and pluralism of the agroecological paradigm (Norgaard & Sikor, 1987, p.25). The clearest way that this contrast between these two paradigms emerges in participants' frames is in the opposition between objectivism and subjectivism. Objectivism is the premise that one can stand apart from the system being studied, while subjectivism assumes that one is always entangled with the system being studied and that one's values will always influence one's perception of the system (Ib id). One of the core themes in the diagnostic and prognostic frames is the notion that the mainstream culture's perceived separation between humans and the earth is a root cause of many problems, and that this relationship needs to be mended and become a relationship of unity and interdependence. Participants were in essence calling for a paradigm shift from objectivism to subjectivism and a transformation of human positioning from a separate, objective, and controlling observer to one that instead places humans as subjects, participating and cooperating within the web of life.

The above paragraphs provide an interpretation of the frames as they relate to society, the biosphere, and the philosophical roots of agroecology, but what do the frames mean in light of agroecology's goal of food system transformation? Gliessman's five levels of food system change provide another lens with which to understand the research results and answer this question (2016). The first level of change, "increasing the efficiency of industrial and conventional practices", did not appear in any of the frames presented by the participants (Gliessman, 2016, p.187-188). Two of the prognostic frames highlighted the possibility for saving money through eliminating synthetic inputs or incremental conversion to organic farming, which corresponds to Gliessman's description of Level 2 transformation: "substitute alternative practices for industrial/conventional inputs" (Gliessman, 2016, p.187-188). Three of the prognostic frames described a more comprehensive system redesign at the farm level according to ecological principles by reintroducing diversity and utilizing practices such as "multiple cropping,

agroforestry, and the integration of animals with crops" (Gliessman, 2016, p.187-188). These frame components are consistent with Level 3 transformation, which entails "redesigning the agroecosystem so that it functions on the basis of a new set of ecological processes" (Gliessman, 2016, p.187-188). More prominent than any of these first three levels of transformation was Level 4: "Re-establish a more direct connection between those who grow our food and those who consume it" (Gliessman, 2016, p.187-188). Four respondents emphasized the need for shorter and more localized food chains and centered the need to re-localize food systems as a core part of their prognostic frames.

Gliessman writes that Level 5 transformation "involves change that is global in scope and reaches beyond the food system to the nature of human culture, civilization, progress, and development" (Gliessman, 2016, p.187-188). This description expresses the heart of how many participants understood the causes of social and ecological problems, and the transformation they called for in their prognostic frames. While many participants did indeed describe the need for Level 2-4 transformations including agroecological practices, more crop diversity, and localized food systems, the deeper yearning expressed in many of these interviews was for a fundamental transformation of culture and societal values, a paradigm shift that echoes Gliessman's call for Level 5 change to transform "basic beliefs, values, and ethical systems" (Gliessman, 2016, p.187-188). Level 5 change also entails "a full re-thinking of how we all relate to each other and to the earth that supports us" (Gliessman, 2016, p.187-188), and this focus on reshaping relationships was integral to the prognostic frames that emerged during the interviews. One participant's frame exemplified this need for re-thinking relationships and explains how agriculture is uniquely positioned to support this relationship of unity and interdependence beyond the food system:

> "Agriculture is the base, we will probably fix a lot of problems using agriculture as a method of life, a method of relationship, a method of seeing our environment. I think it is the sector, the tool, the critical tool for introducing this concept." (Interview, November 19, 2021).

The above quote exemplifies Gliessman's model for how Level 5 change in food systems catalyzes larger societal change that extends to other ecological and social relationships (Gliessman, 2016, p. 189).

The preceding paragraphs offer an interpretation of the results using some core agroecological theories and Gliessman's model of food system transformation. First, Norgaard's coevolutionary model of development was shown to be consistent with participants' diagnostic and prognostic frames, followed by a discussion of how participants' actions and prognostic frames provide empirical support for this model. After this came a comparison of the diagnostic and prognostic frames with the modern scientific and agroecological paradigms, demonstrating how participants were advocating for a transition from an industrial paradigm to an agroecological paradigm. Finally, participants' frames were compared with Gliessman's five levels of food system transformation, illustrating how Levels 2-5 were present in the frames, with Level 5 taking a special significance in the change that many participants envisioned. In conclusion, the resonance between participants' frames and agroecological epistemology, paradigms, and food systems transformation supports the analytic generalization that the ecosystem restoration movement is at its core an agroecological movement.

Conclusion

The findings presented thus far demonstrate that participants in ecosystem restoration rely on a variety of prognostic, diagnostic, and motivational frames, and that there are both common themes as well as tensions within this set of frames. Aspects of the framing approach apply to the ecosystem restoration movement, for example in the core framing tasks (diagnostic, prognostic, and motivational frames) and in the case of categories for motivational frames (severity, urgency, propriety, and efficacy). Other elements of the framing approach and published research are challenged by the thesis findings, particularly the assumption that mobilization always depends on the belief that collective action will generate the movement's desired outcome. The findings also highlight a tension that is present within the movement and the field of restoration ecology, as prognostic frames offered competing interpretations on the

relative importance of supporting restoration versus resisting the systems responsible for ecosystem destruction.

Participants' frames underscore a deep affinity between the restoration movement and agroecology. These frames frequently locate problems and solutions outside of ecosystems by emphasizing culture, values, and social institutions. In doing so, they rely on a coevolutionary model of socioecological systems that recognizes the role of social systems in creating problems and their potential as leverage points for positive change. Observation of the feedbacks between social and ecological systems in participants' frames and the activities of Camp Altiplano and AlVelAl provide empirical support for Norgaard's coevolutionary model. Through their diagnostic and prognostic frames, participants also called for a transition to an agroecological epistemology, especially in the shift from objectivism to subjectivism. Finally, participants envisioned a food system transformation in line with the most ambitious shifts described by Gliessman, especially in their call for a fundamental reorientation of human relationships with ecosystems and the values around which society is organized.

The results of this case study suggest several directions for further study. Future studies of the ecosystem restoration movement should strive to survey a wider cross-section of participants and stakeholders, especially local residents, farmers, and those involved in regional restoration organizations such as AlVelAl. The value of the descriptive frames presented here could also be enhanced by assessing how they are perceived by people outside of the restoration movement. Such studies could help to shed light on the potential of restoration frames to recruit more participants and mobilize resources and public support for restoration. Finally, the apparent contradiction between climate fatalism and the decision to participate in collective action deserves further empirical study to inform effective frames for mobilization and continued engagement in restoration and environmental activism more broadly.

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Appendix 1: Interview Guide

1. Tell me your story, how did you end up here?
2. What is your role here, and what are you doing here?
3. How long have you been here?
4. Why do you participate in or support ecosystem restoration?
5. What is the problem that you are trying to address through your participation with or support of Ecosystem Restoration Camps?
6. In your opinion, what is causing this problem/these problems?
7. When you envision a future in which this problem is solved, what does it look like? Can you describe it to me?
8. What should be done to address this issue and to realize this future you described?
9. How likely do you think it is that this problem will be solved and that this future will be realized?
10. Is there anything that I didn't ask you about that you would like to share?
11. What decade were you born in? (how old are you?)

Appendix 2: Participant Information and Consent Form

Are you interested in taking part in the research project:

"Ecosystem Restoration as a Social Movement"?

This is an inquiry about participation in a research project where the main purpose is to study why people engage in ecosystem restoration. In this letter we will give you information about the purpose of the project and what your participation will involve.

Purpose of the project:
Why do people choose to participate in ecosystem restoration? What worldviews and beliefs lead people to restore ecosystems? What messages do ecosystem restoration organizations use to mobilize people, and how closely do these messages align with the reasons participants offer for their involvement? This project seeks to study ecosystem restoration as a social movement by exploring the above questions through interviews with people involved in restoration. This project will then compare interview responses with published materials from Ecosystem Restoration Camps to examine similarities and differences between individual motivations and those of the Ecosystem Restoration Camps organization.

This research is part of Peter Lewis' master's thesis in Agroecology, and the data collected for this research will be used only for this thesis research.

Who is responsible for the research project?
The Norwegian University of Life Sciences (NMBU) is the institution responsible for the project.

Why are you being asked to participate?
You are being asked to participate because you are or have been a volunteer with Ecosystem Restoration Camps. Approximately 30 volunteers have been asked to participate in this interview process.

What does participation involve for you?
If you choose to take part in the project, this will involve either an in-person interview or an interview via video chat. This process will take approximately 45 minutes, and your answers will be recorded electronically as an audio recording. The interview includes questions about why you are engaging in or supporting ecosystem restoration, the problems you seek to solve through restoration, and what you believe needs to be done to solve the problems you identify. I will also ask your age to provide general context on the sample of participants.

Participation is voluntary
Participation in the project is voluntary. Information about who chooses to participate and not participate in this study will not be shared with Ecosystem Restoration Camps. If you choose to participate, you can withdraw your consent at any time without giving a reason. All information about you will then be made anonymous. There will be no negative consequences for you if you choose not to participate or later decide to withdraw.

Your personal privacy – how we will store and use your personal data
We will only use your personal data for the purpose(s) specified in this information letter. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act).

The only individuals who will have access to the personal data will be the student and supervisor.

To protect your privacy, I will replace your name and contact details with a code. The list of names, contact details and respective codes will be stored separately from the rest of the collected data. The data will be encrypted and stored on the University's secure research server.

After the interview is transcribed, the audio recording will be deleted to protect your anonymity.

Individual participants will not be recognizable in publications, as age, name, and gender will not be disclosed in the published thesis. Age and gender will only be published in aggregate form to describe the demographics of the sample.

What will happen to your personal data at the end of the research project?
The project is scheduled to end 15 May, 2022. All personal data, including digital recordings, will be deleted at the end of the project.

Your rights
So long as you can be identified in the collected data, you have the right to:
access the personal data that is being processed about you
request that your personal data is deleted
request that incorrect personal data about you is corrected/rectified
receive a copy of your personal data (data portability), and
send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?
We will process your personal data based on your consent.

Based on an agreement with NMBU (The Norwegian University of Life Sciences) and NSD (The Norwegian Centre for Research Data AS) has assessed that the processing of personal data in this project is in accordance with data protection legislation.

Where can I find out more?
If you have questions about the project, or want to exercise your rights, contact:
The Norwegian University of Life Sciences via Anne Marie Nicolaysen (thesis supervisor) by email: (anna.marie.nicolaysen@nmbu.no) or by phone +47 67 23 27 87 or Peter Lewis (thesis author) by email: (peter.lewis@nmbu.no) or by telephone +47 48 67 42 45.
Our Data Protection Officer: Hanne Pernille Gulbrandsen (Deloitte) by email: (personvernombud@nmbu.no) or by telephone +47 40 28 15 58
NSD – The Norwegian Centre for Research Data AS, by email: (personverntjenester@nsd.no) or by telephone: +47 55 58 21 17.

Yours sincerely,

Anna Marie Nicolaysen   Peter Lewis
Project Leader   Student
(Supervisor)

Consent form

I have received and understood information about the project "Ecosystem Restoration as a Social Movement" and have been given the opportunity to ask questions. I give consent:

to participate in an interview

I give consent for my personal data to be processed until the end date of the project, approx. 15 May, 2022

(Signed by participant, date)

Appendix 3: Examples of Coded Interview Data

See next page.

Meaning unit	Condensed meaning unit Description close to the text	Condensed meaning unit Interpretation of the underlying meaning	Sub-category	Category	Framing component
We modernized agriculture and we made different agricultural systems and getting rid of the old landscape features and those kind of things. It's not necessarily the best balance. Farmers in the past had to take advantage of nature, they didn't have the pesticides and fertilizers.	Modern agriculture has eliminated landscape features, causing an imbalance and artificial inputs have replaced natural processes of pest regulation and fertilization.	Agriculture based on synthetic inputs and monocultures that eliminate biodiverse ecosystems are a problem.	Agriculture Practices		
Agriculture is one of the most responsible industries for degeneration, but can also be one of the best solutions for regeneration. So let's focus on how we produce.	Agriculture practices are a leading cause of ecological destruction; because of this they can be a powerful intervention point.	Agricultural production methods represent a problem and a solution.		Agriculture	Diagnostic
Also, you see here how you're subsidized to destroy the world. The problem is still a lot in policy.	Agricultural subsidies incentivize farmers to destroy the ecology on their farm.	Current subsidy policies are ecologically destructive.	Agricultural Policy		
There are a lot of farmers here, as in the EU, that rely on subsidies, so they will do whatever the EU or Common Agricultural Policy dictates, which is what Alfonso was saying that if you don't till between your trees then you don't get your subsidies. One of the big problems is that farmers are reliant on subsidies, so they will do whatever the subsidies tell them to do.	Farmers are dependent on subsidies, and these subsidies force farmers to excessively till their land and limit the agricultural practices they have to choose from.	Current subsidy policies are ecologically destructive and restrict farmers from regenerative practices.			

I think just in many areas around the world, farming is just not profitable, just the way our food system is organized. Farmers get nothing or next to nothing for their produce, and their yields are very unpredictable as well, and in terms of what they get for their produce in terms of price is quite unpredictable.	Farming in the current food system is not profitable because of farmers' lack of control over pricing, pricing unpredictability, and yield unpredictability.	The economic organization of the current food system exploits farmers and puts them in a vulnerable position.	Food System		
And I think that Europe-wide and maybe worldwide the way that supermarkets have defined what farming and prices look like, just about everything, gives the farmer a really crappy deal.	The power of supermarkets in setting standards for farming and prices exploits farmers.	The supermarket-driven food system exploits farmers.			

Appendix 4: Example of Coded Participant Observation Notes

1. Diagnostic – institutions - political

G: Agricultural ministry is completely captured by corporate interests. Also ranted about COP26 agriculture session, which happened day before, said it was totally captured by agribusiness-> more monoculture, technological intensification, green revolution and GMOs

G: Altiplano is its own bioregion but is divided between 3 provinces. AlVelAl started as a bioregional governance network, as Altiplano is the forgotten borderlands of the three provinces, the needs of this region are not understood by the provincial governments.

J + B: Discussed corruption + politics in Spain and Netherlands, businesses destroying national parks and ecosystems

2. Diagnostic – Agriculture - Subsidy/policy

G talked about how AlVelAl is not receiving subsidies from the Spanish government, how keyline planting, cover cropping, and minimizing tillage can cause Alfonso to lose his subsidies. He knows farmers that plow to receive subsidies and don't even plant anything, they're just paid to destroy their land

3. Diagnostic – Agriculture – Policy

G ranting about the lies of Bill Gates, and misconceptions around productivity and production -> productivity is the relationship between inputs and outputs.

4. Diagnostic- Institutions - economic system

S + J: it's a privilege to participate, only those with privilege can participate because we have to forego an income and pay. Locals especially are financially unable to participate, as Murcia is one of the poorest regions of Spain

Capitalism was often discussed during planting sessions

5. Diagnostic – institutions

Other participants commented on how a recurring theme in our group's conversations are all of the problems in the world- ecological, political, etc

6. Prognostic - Community
J suggested we make dinner as a group

B said he came here for work that reconnects workshop and that it attracted really wonderful people

Eating meals together, cooking together, sleeping in the same bunkhouse, living together

Chants during planting

7. Prognostic - Food System

We discussed the need to change our food system, and J said we need to transition towards a more labor-intensive, regenerative system

8. Prognostic – Institutions - Government action

G: National version of AlVelAl was recently formed, and that AlVelAl was going to start organizing farmers politically

G talked about needing to create a bottom-up response to climate change, that top-down is not working

Evening talk after dinner talked about alternative governance structures, 3rd demand of Extinction Rebellion: citizens assembly

During planting discussed other protest networks pressuring governments to act and holding them accountable, (e.g. XR) e.g. german fracking in Argentina despite it being outlawed in Germany, Shell fracking in Namibia

F: not possible for government to mandate change in agriculture, farmers must experience benefit of regen ag/agroecology themselves, and be incentivized to change

9. Prognostic – communication

D, R, and G recorded videos of planting to promote AlVelAl and regeneration on social media

10. Prognostic - Ecosystem restoration

Planted various hardy native species, mixed compost with dirt, incorporated organic matter, added mulch of brush, then a ring of rocks for sin/wind protection and condensing moisture, placed tree at lowest point and dug snall channels to direct water runoff into hole

Acorn walk, learning about local species, collecting genetic diversity for trees

Gathered fungi-rich soil from base of oak trees, white, dark

Direct seeded oak acorns with nitrogen fixing nurse shrubs (Retama)
Planted oaks on NW side of Retama for wind and sun protection

G: described restoration results including bird population up by 60%, bird diversity has increased. Creating habitat for birds of prey, predators that balance agricultural system

    11. Prognostic – culture - way of life

Off-grid living with water collection, energy, cycling

    12. Prognostic- culture – learn new skills

I taught species identification knowledge I learned from B to new campers on our acorn walk

Observed my experience of the landscape and relationship with landscape changing after learning to recognize different species and their relationships, collected juniper berries

Learned how to make compost from T

    13. Prognostic – change by example

S: Altiplano is trying to create a model for regenerative ag that is productive and economically viable, and scalable throughout the region
Camp is experimenting, can afford to experiment in ways that a productive farm cannot

S: First farmers drove by on tractors, complained about keyline curves, now they're noticing the soils is improving and showing interest

    14. Prognostic – optimism

F talked about need for optimism and hope; world rebuilt after WWII, so it is possible for society to rebuild planet.

Subject of much debate within the camp, some optimistic, some very critical. Others, citing systems theory said that disturbance is necessary for systems to learn, adapt and evolve. Contested interpretations and meanings around climate change and mass extinction.
-   F grew up in a time of war, fear, child of cold war. S America, Africa, and Asia were burning, it's better now than it used to be. These differing perspectives seemed to be drawn across generational lines among the participants.
-   Debate around optimism in creating the new vs grief and anger and fighting against what's being lost
-   T traveled around the world and concluded that everyone is sensing that something is wrong

15. Action – Enjoyment
Listened to music, chatted and danced while planting trees

Bellotada – acorn collection party, 18 people 4 men, the rest women. Almuerzo (midday meal) eating almdnrehesa products from AlVelAl, drinking wine, eating bread and cured meats, honey, nuts, fruits, jovial atmosphere

B enjoys collecting seeds from many different species, flowers

16. Action – efficacy

Complex systems – M was asked why he is at camp over dinner, said he is attracted to the possibility of making small modification e.g. swales to create large effects.