GOALS, APPROACHES, AND BARRIERS IN LANE COUNTY AGROECOLOGY

by

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The global industrial food system is a major contributor to climate change and environmental degradation (Lal, 2015; Li et al., 2025). Unsustainable practices such as monocropping, high-intensity tillage, and heavy chemical use damage ecosystems and soils, while heavy machinery and long-distance transport of products contribute greatly to greenhouse gas (GHG) emissions (Lal, 2015; Li et al., 2025). The domination of large-scale, industrialized farming has come with social and economic consequences as small, local family farms are forced out of business and the rural areas they occupy suffer from land abandonment, economic depression, and depopulation (Berti & Mulligan, 2016). Local agriculture movements and short food supply chains have emerged as efforts to revitalize rural farming communities and increase urban community involvement in food production (Berti & Mulligan, 2016; Seigner et al. 2019). These interventions address the social and economic drawbacks associated with conventional agriculture and, in many cases, can reduce the GHG emissions associated with long-distance transportation (Berti & Mulligan, 2016; Coelho et al., 2019). However, shifting the needle on agriculture's environmental impact requires a change not just in the scale of distribution but also in the practices that govern production; local food systems need to grow food in a manner that preserves environmental health (Coelho et al., 2019).

Agroecology, which represents a suite of scientific understandings, technical practices, and social values, offers a framework for environmentally sustainable farming with an emphasis on local context, and is therefore a useful tool for goal setting and evaluation in sustainable agriculture (Gleissman, 2015; Siegner et al., 2019). Agroecology has been recognized worldwide as a viable and important strategy in the move towards sustainable food systems; the Food and Agriculture Organization of the United Nations (FAO) incorporated agroecology and its tenets into recommendations to support sustainable agriculture, food security, and nutrition (HLPE, 2019). Formal definitions and principles of agroecology, developed by scholars and experts, facilitate the discussion and study of agroecology, but may not capture the wide range of goals and practices used by food producers. This research examines local adaptations in agroecology in Oregon's Lane County. How do agroecology's central tenets manifest in the goals held by farmers? What technical practices do they use to pursue these goals, and how are they informed by local culture and climate? Finally, what significant barriers do farmers practicing agroecology face in Lane County, and how might they be addressed?

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Introduction

The shift towards industrialized and highly intensified enterprises in conventional agriculture has contributed to multiple crises in food production: economic, social, and environmental factors threaten the future of food security around the world (Berti & Mulligan, 2016). Large farming enterprises have put incredible pressure on small farms, forcing many out of business and resulting in social and economic consequences in rural areas (Berti & Mulligan, 2016). The rise of industrialized agriculture has also led to increasingly long food supply chains, with implications for food quality and GHG emissions (Berti & Mulligan, 2016; Coelho et al., 2019). Conventional agriculture production relies heavily on practices like monocropping, tillage, and intensive chemical inputs, which lead to soil degradation and further GHG emissions, threatening environmental health and future agronomic productivity (Haddaway et al., 2017; Lal, 2015; Suarez & Gwozdz, 2023).

Agroecology is a multifaceted approach that offers solutions for the social, economic, and environmental impacts of large-scale conventional agriculture. The philosophy began as a form of resistance to the simplification, industrialization, and corporatization of the food system, focusing on the replacement of synthetic chemical inputs with organic farming methods (Gliessman, 2018). As agroecology evolved, it grew to incorporate social and technical elements that focus on biodiversity, ecological resilience, local knowledge and culture, and circular economies (FAO, 2018). These elements include regenerative agriculture techniques like cover cropping, reduced tillage, intercropping, composting, and the reduction of chemical inputs; social elements include the incorporation of indigenous crops and practices and the responsible engagement of local governments (FAO, 2018). Agroecological principles are therefore highly relevant in the study of local food economies; for local food economies to have the most

beneficial impacts, they need to contribute not only to shorter supply chains but also to the widespread adoption of responsible farming techniques (Coelho et al., 2019).

The expansion or development of regional and local food markets can reduce supply chain emissions, support small-scale farmers and rural communities, and diversify agricultural production by encouraging the cultivation of regionally adapted crops (Berti & Mulligan, 2016). Local agriculture may represent an important environmental intervention; the conventional practices used by industrial operations are widely damaging, but small farmers that sell in local markets may be more likely to incorporate practices described and encouraged by agroecology.

Consumer demand for locally grown food is high; the majority of Americans consider the availability of local food to be an important factor in their choice of supermarket, and restaurants are increasingly incorporating and advertising locally sourced menu items (Tropp & Moraghan, 2017). However, the proportion of food produced and consumed locally in the US is still very small; in an age of industrialized, large-scale production, the barriers to local agriculture are significant (Tropp & Moraghan, 2017). Smaller-scale operations require larger profit margins, local labor costs may be higher than in other regions or countries, and government subsidies that keep many farms afloat may only support commodity cash crops sold on the national market (Tropp & Moraghan, 2017).

Agriculture plays an important role in Oregon's economy; in 2008, agriculture made up nearly $4 billion of the state's GDP, or 2.47%, over twice the national average share (Parker et al. 2010). The Willamette Valley hosts the majority of the state's population and most of its agriculture (Parker et al., 2016). Lane County, situated on the southern end of the valley, has over 200,000 acres of farmland, mostly producing forage for livestock and grass seed crops (U.S.

Department of Agriculture, 2017). Only 17% of the county's farms sell directly to consumers (U.S. Department of Agriculture, 2017).

Even so, regional interest and engagement with local food systems is significant. A study of consumers in Albany, and Corvallis, two cities in the Willamette Valley, found that 87% of respondents thought purchasing from local farmers was "somewhat important" or "very important" (Parker et al., 2010). Downtown Eugene, Oregon has hosted the Lane County Farmers Market since 1915, making it the longest-running farmer's market in the Willamette Valley (Lane County Farmers Market). Nonprofit programs, including the Willamette Food & Farm Coalition, support local agriculture and community health by expanding consumer access to locally grown food (Willamette Food & Farm Coalition).

Agroecological principles are particularly relevant in small-scale, local farming; agroecology is focused on integrating and adapting to local culture and climates (FAO, 2018). For this reason, manifestations of agroecology are unique to their environments, showcasing a diversity of approaches. Studying Lane County's local food economy may reveal novel approaches to the implementation of agroecology, which may have meaningful implications for the expansion of local food and sustainable agriculture in other regions.

Ecosystem impacts of conventional agriculture practices

Conventional agriculture practices have significant impacts on local and regional ecosystems: chemical inputs, heavy tillage, monocropping, and land use changes cause ecosystem-wide effects, decreasing biodiversity and habitat quality on farms, in waterways, and in surrounding ecosystems (DeBano et al., 2016).

Fertilizer use in agriculture is known to increase nitrogen and phosphorus levels in waterways as nutrients are flushed away from agricultural fields by precipitation and irrigation

drainage; fifty-five years of monitoring found that a 10% increase in fertilizer use led to approximately 1.5% increases in both nutrients in U.S. waterways (Paudel & Crago, 2020). The consequences of elevated nutrient levels include the excessive growth of phytoplankton in streams and rivers, sometimes causing downstream effects including marine hypoxic zones (Dodds & Smith, 2015; Paudel & Crago, 2020).

In the Pacific Northwest, many streams are categorized as water quality-impaired due to high nutrient concentrations; most of the nutrient input comes from agricultural sources including manure and other nitrogen fertilizers, rather than from naturally-occurring nutrient sources or ecosystem processes (Wise & Johnson, 2011).

Pacific Northwest waterways also demonstrate evidence of pesticide pollution, posing a potential threat to endangered salmon species and sensitive invertebrates (Hapke et al., 2016). A 2012 stream survey in the Hood River Basin, a major agricultural region in Oregon, found detectable levels of multiple insecticides, with endosulfan levels exceeding thresholds set by the U.S. Environmental Protection Agency (Hapke et al., 2016).

Increased sediment load is yet another agricultural impact on waterways; soil erosion can increase sedimentation, reduce water clarity, and negatively impact aquatic and marine life (Zahoor & Mushtaq, 2023). Sediment erosion from agricultural fields can also carry pollutants including pesticides, fertilizers, and heavy metals, decreasing water quality for habitat and recreation (Zahoor & Mushtaq, 2023). High nutrient and sediment levels in streams are associated with lower adoption rates of conservation tillage practices; a long-term stream survey in Iowa found that in the in the 1990s and 2000s, as awareness grew around the drawbacks of conventionally, heavy-till practices, agricultural inputs into streams decreased (Renwick et al., 2018).

Soil degradation: causes and impacts

Soil degradation, including the loss of topsoil, soil fertility, structure, and microbial biodiversity, is a significant impact of conventional agriculture, presenting a threat to the future of global food security (Lal, 2015). Even as demand for agricultural products increases with growing populations, soils around the world are declining in quality and quantity (Lal, 2015). Soil health has been defined as the ability of soil to continue to function as a living organism within ecosystems, serving vital roles in ecosystem function and human health (Lal, 2015). Healthy soil is essential for food security and ecosystem services including clean water, maintenance of biodiversity, carbon sequestration, and more. These benefits are best provided when the soil has appropriate organic matter content, aeration, moisture content, and nutrient levels (Lal, 2015). Unfortunately, these factors are not well-maintained by conventional agriculture practices: soil degradation now affects up to 33% of the globe's surface, leading to severe consequences; between 1950 and 2010, soil ecosystem services declined by an estimated 60% in the tropics (Lal, 2015).

Soil degradation can stem from the erosion of topsoil, loss of soil organic content (SOC) and soil nitrogen, decline in microbial activity and diversity, acidification, and salinization (Lal, 2015). According to the framework established in Lal 2015, soil degradation generally falls into four categories: physical, chemical, biological, and ecological. Physical degradation refers to the disturbance of soil structure, which decreases permeability and increases surface runoff and erosion; examples include tillage and increased compaction. Chemical degradation occurs when contamination, acidification, salinization, or acidification alter a soil's nutrient or chemical profile. Biological degradation takes place when soil organic carbon (SOC) levels are depleted,

leading to a loss in microbial diversity and a decrease in soil's ability to sequester carbon, sometimes to the degree that soil becomes a net emitter of greenhouse gases (Lal, 2015).

The process of soil degradation often begins with extractive farming practices, including monocropping, tillage, improper irrigation practices, and excessive bare soil (Lal, 2015). The widespread, although decreasing, practice of heavy tillage contributes to decreased SOC, a component of biological soil degradation; a 2017 systematic review found that high-till farmlands consistently had lower SOC levels across multiple depths down to 30cm (Haddaway et al., 2017). Tillage also disrupts soil structure, contributing to physical degradation and erosion (Lal, 2015).

Continuous irrigation can also contribute to salinization, a major driver behind chemical degradation. When irrigated soils have inadequate drainage, soil salinity and saturated conditions develop, leading to decreases in productivity (Singh, 2020). Huge swaths of land globally are affected by salinization, including 28% of the total irrigated land in the United States.

Although the global distribution is not uniform, soil degradation is a worldwide problem, with impacts occurring locally in the Pacific Northwest. Some of the region's most productive agricultural regions are suffering the worst degradation. The Palouse Valley in Southeast Washington, for example, is a significant producer of wheat and suffers from soil erosion, loss of soil organic matter, and acidification (Davis et al., 2023). These processes present a significant threat to current and future agricultural productivity and threaten food and economic security (Davis et al., 2023).

Barriers to agroecological practices

Despite well-recognized benefits, the implementation of agroecological principles faces significant barriers. As a philosophy deeply rooted in socioeconomic principles, agroecology systems depend not only on the specific techniques employed by farmers but also on the social and economic networks in which they exist (Dumont et al., 2021; Gliessman et al., 2019). When these systems do not support, for example, fair wages for farm workers or direct connections between food producers and consumers, the implementation of agroecological principles is more difficult (Dumont et al., 2021). The need to integrate into global markets often inhibits sustainable practices because the cost of labor and material inputs, as well as the market prices of goods, are set in the context of conventional production (Dumont et al., 2021).

Gliessman et al. (2019) describe five "levels" of agroecological transitions, only three of which depend on on-farm factors. The first level involves increasing efficiency to reduce the consumption of scarce environmental resources; examples include research in precision agriculture. The second level is the substitution of alternative inputs and practices for conventional ones, including cover cropping and nitrogen-fixing crops as an alternative to chemical fertilization; this level is where many organic farming systems exist. The third level calls for fundamental change to the organization of production, focusing on ecological structure and function within the farming system, mimicking or recreating the processes found in nature to foster resilience and productivity. Examples include agroforestry, or the combined production of tree and understory products, and silviculture, the combination of grazing and plant crop cultivation (Gleissman et al., 2019).

These technical approaches lay the groundwork for agroecology's environmental benefits, but the interventions of individual farmers within the large-scale agricultural system do

not represent a complete solution (Gleissman et al., 2019). The fourth and fifth levels of agroecological transitions rely on large-scale changes to the growth and distribution of food. The fourth level is the re-establishment of direct connections between growers and consumers of food; local food networks composed of farmers markets and community-supported agriculture systems can support food sovereignty in this level. The fifth level, which is largely theoretical, calls for the development of a new global food system that fosters equity, participation, and justice while going beyond sustainability to restore essential global ecosystem services (Gleissman et al., 2019).

Without political and economic changes or alternative markets that support the fourth and fifth levels of transition, implementing the first three is more difficult (Dumont et al., 2021; Gliessman et al., 2019). On a practical level, on-farm barriers manifest in many ways. Aare et al. (2020) identified specific barriers faced by a set of farmers implementing agroecological methods. Through interview-based case studies, researchers identified five barriers, all of which were at least partially related to off-farm factors (Aare et al., 2020). Three of the barriers were connected to deficits in research, education access, and plant variety development, suggesting that more attention in academia and industry is required. Legislation presented another barrier; farmers identified regulatory obstacles including mandatory antibiotic medication of animals and restrictions on grazing practices. Finally, farmers cited economic constraints; wholesale purchasers, for example, did not want to buy the small quantities of each product produced in a diverse polycropping system, instead setting minimum amounts that are difficult for small farmers to produce without monocropping.

The levels of agroecological transition (Gliessman et al., 2019) and barriers to its practice (Aare et al., 2020) indicate that widespread change may rely on shifts in regulatory, economic,

and social factors more than on the choices of individual farmers. However, growing awareness of the social, economic, and environmental impacts of conventional agriculture (Berti & Mulligan, 2016) and of the mounting threats that climate change and soil degradation pose to agronomic productivity (Lal, 2015) may prove to be powerful drivers behind individual and large-scale decision-making.

Methods

This research applies existing frameworks in agroecology to small Willamette Valley farms, using case studies to understand the role of these farms in the agroecological transition and the significant barriers they face. Included case studies focus on Lane County farms with less than 50 acres of property in production; each farm is managed with agroecological, regenerative, and/or biodynamic practices.

A 2018 report from CIDSE (Coopération internationale pour le développement et la solidarité) outlines four broad dimensions of agroecology and the principles that compose them: environmental, social and cultural, economic, and political. These categories encompass the wide-reaching, interdisciplinary goals and applications of agroecology while simultaneously identifying a cohesive set of principles focused on biodiversity, environmental health, and equal and just access to food (CIDSE, 2018). To illustrate the tangible and practical implementation of these goals, activities and approaches from each study site are categorized according to these dimensions, illustrating the diverse ways in which small-scale Willamette Valley farmers practice agroecology.

Similarly, Dumont et al. (2025) propose a framework to categorize barriers and enablers in agroecology across socioecological contexts. This eight-category framework describes the manifold challenges and opportunities that farmers face, including in policy, market, infrastructure, technology, cooperation networks, access to natural ecosystems, culture, and equity. This study applies these eight categories to interview data collected from Lane County farmers, identifying key areas to which support should be directed. By utilizing a pre-existing framework, this study explores the specific challenges and opportunities unique to agroecology

in this region while also situating these findings in the greater context of global food system change.

Interview data was also used to identify specific barriers faced by agroecology farms in this particular region, highlighting future directions for research and advocacy.

Data collection and analysis

Semi-structured interviews

Data collection for this project was interview-based. Information about farm history, ownership, technical practices, and other activities was given by farmers. Interviews were scheduled using a combination of convenience sampling and snowball sampling. Interview requests were widely sent, and interviews proceeded with available farmers; contacts for future interviewees were collected at the end of each interview.

Interviews were between 30 and 90 minutes long; all but one were under an hour. Audio was recorded on a personal smartphone and a backup mp3 audio recorder. Interviews took place on-farm (F1, F2, F3) or at a farmer's market (F4, F5). Interviews followed a structured guide but were conversational in nature. When interviews were conducted on-farm, they included tours of the property, including gardens, pastures, barns, and restored habitat; observations from these tours are included in the analysis.

Data analysis

Interview recordings were transcribed using the software Revoldiv and then cleaned by hand. Transcripts were then coded; codes were taken from existing literature as previously described. Goals and specific approaches were categorized into groups based on the four

dimensions of agroecology described by CIDSE.; the resulting table illustrates the manifold ways in which the farms in this study practice and advance agroecology.

The eight categories of challenges from Dumont et al. were used to generate a color-coded table identifying the role of each category in this study; this is the same analytical and graphical approach applied by Dumont and colleagues in their original paper proposing this framework. The role of each category was briefly discussed, including similarities and differences in its manifestations across farms.

Finally, interview data was used to develop a series of specific barriers faced by agroecology farms in Lane County. These barriers were mentioned by multiple farmers, have specific relevance in this region, and present important areas of focus for future efforts to support farmers.

Research scope and limitations

This research is composed of five case studies, all of which involve small-scale agroecological farms in Lane County. These farms showcase the diverse forms and approaches taken in agroecology, but are by no means an exhaustive catalogue. Farmer backgrounds and histories varied; some farms have been in operation for decades, while some got started in the last five years. Similarly, some farms were the primary mode of employment and some were managed by retired farmers, and some were involved with nonprofits while others were privately owned and operated. This wide variation allowed this study to characterize agroecology across aspects of production, encompassing not only the economic approaches that businesses take but also the environmental and social approaches found on farms run for personal fulfillment.

Because interviews were, by necessity, conducted during the busy summer season, scheduling with farmers was difficult. Most study sites were selected through snowball

sampling; this method, in combination with the small sample size, means these farms do not constitute a representative sample. However, the perspectives from these interviews offer insight into the goals and the challenges faced in advancing agroecology across many local contexts.

Results

Table 1: Demographic information of farms used for case studies.

	F1	F2	F3	F4	F5
Farm size, location.	Six acres, just outside city limits in Exclusive Farm-Use zone.	21 acres; two acres of garden, one acre of orchard, approx. 10 acres of pasture. Outside city limits.	250 acres property with 50 acres of farmland, 16 acres in pasture.	42 acres with orchards and a nursery.	30 acres of 92 acres property; remaining 60 acres in riparian restoration. 1.25 acres of flower fields, the rest pasture.
Farm history and ownership	Owned by retired farmer, in operation for three years at this site.	Leased from neighbor for nearly 30 years; previously operated as a non-profit.	Family-owned farm, now owned by family non-profit; operated by family member. Property with conservation easement.	In the seventh year of operation, land is owned by farmers.	In fifth year of operation; leased from nonprofit on land with conservation easement.
Employees	None; some on-farm interns, paid in shares of their profit.	None.	No permanent employees; help hired for short-term projects, trainees live on farm.	Yes - full- and part-time	Six part-time.
Products	Meat (sheep, goats, chickens), eggs, vegetables.	Nuts, fruit, vegetables, dairy, meat, eggs, value-added products; fermented and preserved on-site.	Eggs and meat for sale, fruit and vegetables grown for on-farm consumption.	Fruit, plants and plant starts, value-added jams and preserves.	Eggs, meat (chicken) cut flowers.
Sales channels	On-farm farmstand.	On-farm farmstand.	CSA, local restaurants.	Farmer's market, wholesale clients, online multi-farm distribution platform.	Farmer's market, CSA, on-farm farmstand.
Other activities	Gardening classes and workshops, farm internships.	Former nonprofit was education-focused, hosted field trips and short-term visitors.	Extensive riparian, prairie, and forest restoration for habitat creation; young farmers live on-farm as possible successors.	Close collaboration with nonprofits and community organizations through online distribution hub.	

The farms in this study all had 50 acres or fewer in active production; some properties had large areas in active restoration (F3, F5). Three farms were owned outright by the farmers who operated them, while the other two were leased from or owned by conservation-focused nonprofits. Two farms are operated by full-time farmers for-profit enterprises (F4, F5), while the

remaining three are run by farmers who are at least semi-retired (F1, F2, F3). Only two farms had permanent employees (F4, F5); the others relied on interns or short-term, project-based hires (F1, F3), or operated on a very small scale that required no additional help (F2). All farms had a diverse array of products, and all but one (F4) produced both plant and animal products. Value-added items like jams and pickles, made on-site, were sold at two farms (F2, F4). All farms sold directly to consumers through farmstands, CSAs, or farmers markets; some distributed wholesale orders to local restaurants (F3) or utilized online distribution hubs (F4). Finally, all farms except for one (F5) were involved with a variety of activities not directly related to food production; examples include gardening classes and workshops (F1), riparian restoration projects (F3), internships or similar programs designed for aspiring farmers (F1, F3), and collaboration with local nonprofits to expand access to fresh, local produce (F4).

Approaches

Table 2: Approaches to advance each of the four dimensions of agroecology.

	F1	**F2**	**F3**	**F4**	**F5**
Environmental: consideration of ecological history, input reduction, recycling, habitat preservation, fostering of ecological interactions; maximization and diversification of roles and functions of land.	Huts and sheds constructed from recycled billboards. Run chickens and ducks in multipurpose orchards and garden plots; silvopasture with sheep and goats. Crop rotation to foster soil health and pest prevention. Prepare soil with chicken manure, in-situ	Vegetable waste used as animal feed. Garden plots relocated every five years to different sites on property. High diversity in garden plots, encouraging pest control. Rotational grazing for soil and animal health. Primary fertility sourced from	Extensive habitat restoration; channelized streambed re-braided and replanted with stabilizing willows. On-farm energy generation with methane (previously) and solar. Net power surplus produced. Electric equipment, including tractors and cars.	Organic-certified production; minimal chemical use for pest control or fertilization. Focus on perennial tree products rather than annual vegetables to reduce tillage requirements and improve soil health.	Mixed-species grazing. Organic, pollinator-safe management for pastures and flowers; pesticide-free. Rotational grazing to support animal and soil health. Cover crops and flower field rotation. Whole-systems fertility approach: chickens supply

	composting of vegetable scraps and animal remains. Control invasive plants and create viable habitat with goat grazing. Minimize irrigation by maintaining healthy soils high in organic matter.	composted animal manure. Insect habitat created across seasons; early, middle, and late-blooming flowers planted for nectar sources, including milkweed for monarch butterflies. Cover crops intersown with vegetable and grain crops. Minimal fossil fuel usage and tillage. Strategic orchard planting to maximize habitat value for birds.	Pasture planted with oak to mimic native prairie habitat type. Animal selection informed by environmental impact; sheep preferred to cows for soil health and for reduced outside feed requirements.		approx. 30 percent of the farm's fertility needs. Remainder of compost needs met through municipal compost service.
Social and cultural: horizontal sharing of skills and knowledge; respect for culture and tradition of local communities; cooperative exchange of goods and services between producers; alternatives to costly organic certification, including Community-Supported Agriculture (CSA).	Farm internships for aspiring farmers; lease land and supplies to farmers-in-training. Gardening classes, workshops, public volunteer events and celebrations. Exchange of grazing sheep on neighbor's land for invasive species control. Practice organic agriculture without paying for certification.	Sharing of supplies and equipment with nearby farmers. Organic and biodynamic methods implemented without external certification. Bike-delivered CSA, grade school field trips, overnights.	Host young farmers to train and as possible successors. Allow development and testing of feed mixes on chickens, in collaboration with local colleague.	Distribution network involves collaboration with 30 other local farmers. Vendor discounts offered at farmer's market.	Meaningful cooperation with conservation nonprofit, working in parallel with conservation activities and to integrate regenerative agriculture with conservation.

Economic: short distribution networks and relationships with consumers; diversification of on-farm incomes to support economic resilience; harness the power of local markets by enabling food producers to sell their produce at fair prices.	Direct-to-consumer marketing with on-farm stand. Diverse product selection, value-added products, membership fees.	Direct-to-consumer marketing; focus exclusively on neighborhood rather than on going to farmer's markets or larger distributors. Wide variety of products offered year-round; storage crops and preserves emphasized in winter and early spring. Self-service, honor system farm stand with rotating stock.	CSA eggs distributed weekly by farmer; marketing based on individual relationships. Inputs sourced and outputs sold as locally as possible.	Distribution network supports inter-farmer connections and consumer access to local food.	Direct-to-consumer sales at farmer's market, CSA, on-farm farmstand. Supplying local flowers in an import-dominated market. Buy seeds from local growers and distributors.
Political: reduce reliance on large industrial food and agricultural systems; put control of seed, biodiversity, land and territories, and water into the hands of food producers and consumers.	Save seeds and minimize other inputs Ownership of land in Exclusive Farm-Use zone: benefit from and encourage reduced property taxes for farmers.	Save and share seed season-to-season. Cooperation with nonprofits and trusts seeking input from farmers. Steward leased land through habitat maintenance, pollution reduction and water filtration, and infrastructure additions.	Nonprofit ownership of farm, in combination with conservation easement, allows management informed by the priorities of the producers.	Support for fair wages for employees. Enable low-income consumers to access local food by working with nonprofits and government funding through distribution network.	Prioritizing fair wages and meaningful work for employees. Save seeds from current crop. Cooperate with conservation nonprofits and local governments to create policy that works for both agriculture and conservation.

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CIDSE describes four dimensions of agroecology; these are areas and goals that unite the diverse and interdisciplinary practice of agroecology (CIDSE, 2018). Each farm in this study advances goals in environmental, social and cultural, economic, and political dimensions through intentional practices. These practices are contextually dependent and locally adapted, a key component of agroecology (CIDSE, 2018).

Practices in the environmental dimension

The environmental dimension of agroecology emphasizes impact reduction, sustainable resource use, the closing of on-farm nutrient cycles, increased biodiversity, and resilience and adaptation to the effects of climate change (CIDSE, 2018). Among these case studies, some practices were near-universal, while others represented unique approaches. All farms in this study used compost to enrich their soils and reduce or eliminate chemical fertilizers; while some supplemented with imported compost, many generated all their fertility on-farm. Similarly, farms avoided chemical pesticides, instead relying on diversity and crop rotation in gardens (F1, F2), rotational grazing of animals (F3, F5), and integrated pest management practices, including the fostering of beneficial insects (F1, F4). Most farmers did not describe significant pest concerns, instead citing plant, animal, and ecosystem health as protective or preventative factors that keep insects and disease at bay.

Farmers supported local biodiversity with approaches including riparian and grassland restoration (F3, F5), and habitat creation for wildlife and insects (F1, F2, F3, F5). Specific examples vary: F3 carried out an extensive riparian restoration project on a stream in his property, rebraiding the channel and replanting bank-stabilizing willows; these willows now serve as grazing material for pasture cows. He also selected plants from native oak savanna vegetation communities to replant in his pasture. F2 planted a row of tall, dense cedar trees to serve as a windbreak to intercept pesticides that may carry over from neighboring farms, and planted orchard trees with enough proximity to nearby woods to invite songbirds into the orchard. F1 used sheep and goats to control highly invasive blackberry vines, first clearing her own property and then, with her neighbor's agreement, grazing her animals in nearby land to improve habitat quality there.

Practices in the social and cultural dimension

The social and cultural dimension of agroecology is centered around incorporating the culture, traditions, and knowledge of local communities into food productions, and around sharing knowledge and opportunities in agriculture with a diversity of aspiring food producers. This dimension also incorporates the preservation of consumers' relationships to land and food production; it also encourages or allows farmers to market organic food with trust-based producer-consumer relationships rather than with expensive external certification (CIDSE, 2018).

In these case studies, agroecology's social and cultural aspects manifest in education and training programs (F1, F3), in cooperative sharing of information and resources between farmers and with outside groups (F1, F2, F3, F4), and in the implementation of organic, biodynamic, and regenerative practices without outside certification (F1, F2, F3, F5).

Education and training programs in these case studies took the form of gardening workshops for the public (F1) and entrepreneurship-based internships in which interns used farm property and resources in exchange for a share of the profits they generated (F1). Similarly, apprentices with F3 ran their own operations on the farm's land, getting training and resources in the hopes that they may eventually take over operation of the entire farm. Before retiring, F2 hosted an education-focused nonprofit that ran field trips for grade-school children, hosted interns from neighboring farms for short rotations, and had a guest house for visiting students. Additionally, F3 works with a local feed distributor to develop feed mixes that are exclusively locally sourced; he allows the distributor to test new mixes on his chickens, supporting the generation of new knowledge and better techniques.

Networks of cooperation and collaboration include sharing equipment including lawn mowers and tractors (F2), exchanging the use of pasture for invasive species control (F1), and offering discounts to fellow vendors at farmers markets (F4). F4 operates a local distribution hub, a business that works collaboratively with approximately 30 local farms to provide consumers with online access to local products.

Practices in the economic dimension

The economic dimension of agroecology is based on principles that connect consumers to producers with short supply chains, support farmers' resilience and independence with diverse on-farm incomes, and strengthen local markets and economies (CIDSE, 2018). In these case studies, direct producer-consumer relationships were important on all farms. On-farm farmstands were the primary sales channel for two farms (F1, F2), while others used CSA models (F3, F5) and farmers markets (F4, F5). F3 also worked with wholesale customers, and cited personal relationships with consumers as a significant factor in supporting his sales. F4, as mentioned above, operated an online distribution hub that allowed consumers to easily buy from local producers. In addition to selling their goods locally, many farmers also prioritized buying inputs locally; F3, for example, sourced his chicken feed exclusively from Willamette Valley producers whenever possible, and farmers who bought seeds did so from small local companies (F1, F5).

Diversity in production is an important component of economic resilience on small farms (CIDSE, 2018); each of the farms in this study had a highly diverse array of products. All but one (F4) produced both plant and animal products, and two (F2, F4) supplemented with value-added items like jams and pickles.

Some farms even diversified their incomes beyond food sales. F1 charged a fee for gardening workshops, generating income while also advancing goals around education and community engagement. F4 did not primarily generate income from sales of farm products; the online food distribution hub served as both a tool to connect farmers and consumers and as a form of economic support for an individual farm.

Practices in the political dimension

The political dimension of agroecology is characterized by the transfer of power from large, industrialized corporations to small local producers. To this end, agroecology focuses on putting control of land, water, seeds, and other natural resources in the hands of small producers (CIDSE, 2018). Social organization and supportive public policies are also critical to agroecology's political goals (CIDSE, 2018).

The farmers in these case studies disengaged from industrial powers by saving seeds or buying them locally (F1, F2, F5) and owning their own land and making decisions informed by priorities other than profit (F1, F2, F3, F4). Many of these farmers supported food sovereignty for themselves and their communities by expanding their own and others' access to sustainably produced local food (Nyéléni, 2007). Some semi-retired farmers cited feeding themselves and their family as their first priorities, prioritizing self-sufficiency and disengagement from the industrial food system (F1, F2, F3). F2, operating from an on-farm farmstand, sells her goods at only the neighborhood level, prioritizing connection to a small community.

Those farms with traditional employees (F4, F5) mentioned the importance of paying a living wage and treating workers with respect and dignity, supporting fair treatment of laborers and breaking with the paradigm of inequity in industrial agriculture (CIDSE, 2018).

The farmers in these case studies worked with nonprofits, land trusts, and grassroots organizations, helping build the systems that support agroecology. F5, cultivating land leased from a conservation nonprofit, worked with this nonprofit and other partners to effectively integrate the priorities of conservation with regenerative agriculture; by doing so, they were able to work with the language of the land's conservation easement, and to inform future policy that will be more conducive to agroecology. F3, similarly, worked with a nonprofit run by the original owners of the farm to prioritize habitat restoration for wildlife conservation while also maintaining enough productivity to generate meaningful amounts of food. Finally, the online distribution hub operated by F4 partnered with local nonprofits to provide fresh local food not only to customers paying full price, but also to low-income customers with health needs who would benefit from discounted or free access to the same products.

Table 3: Barriers, opportunities, or mixed factors in each domain of agroecology

	F1	F2	F3	F4	F5
Policy					
Market					
Infrastructure					
Technology					
Access to natural ecosystems					
Cooperation networks					
Culture					
Equity					

Table legend: Green squares indicate domains dominated by opportunities, red squares indicate domains that pose significant barriers, and yellow squares indicate that opportunities and barriers exist simultaneously. Domains with white squares were not described as significant in semi-structured interviews.

Policy

The policy domain posed many barriers to the farmers in this study but also offered the opportunity to enable meaningful progress. The most notable policy barriers arose from federal inspection requirements for the sale of meat and dairy items; every farmer in this study mentioned the difficulty associated with the timely transport to far-away inspection facilities. F3 stopped selling certain packaged meats due to this barrier, and F5 cited inspection policies as the most significant reason he didn't raise and sell meat products besides chicken.

Other policy barriers included working within the bounds of conservation easements on leased land (F5), working with the expenses and inspections associated with organic certification (F1), and declining federal financial support for small farms (F4).

Key enablers were associated with government policy and with nonprofit advocacy. Collaboration with nonprofit groups allowed improvements in policy, informed by farmers themselves (F2, F3, F4, F5). Farmers mentioned the Double Up Food Bucks program, which matches EBT/SNAP benefits dollar-for-dollar and allows low-income consumers to shop at farmers markets at reduced costs (F2, F4, F5); this program supports equitable access to food and allows farmers to sell their produce to more consumers.

Similar government programs support small farmers by waiving farmers market fees for the first year of operation and by offering grants to fund working land conservation easements (F1). The Oregon Agricultural Heritage Program, signed into law in 2017, funds working lands easements, conservation plans, and succession planning for farms and ranches in Oregon (Coalition of Oregon Land Trusts, 2019).

Market

Markets presented significant barriers for the farms in this study but also represented opportunities for creative approaches and problem-solving. The rising costs of land, labor, housing, and inputs were universally cited as difficulties among these case studies. The rising costs of production were compounded by consumer reluctance to pay increasing prices for food, especially when industrial competitors offer artificially low prices supported by government subsidies and inequitable labor practices (F1, F4, F5).

However, these farmers have employed a variety of approaches to deal with these market challenges. By fostering personal relationships and focusing on small community markets, farmers build reliable customer bases (F2, F3). The creation of value-added products like jams, cheese, and preserves increases profit margins and provides goods to sell year-round (F2, F4). The innovative distribution hub operated by F4 connects producers to new consumers and to each other, offering a model to expand markets.

Infrastructure

The lack of local meat inspection facilities was by far the most frequently cited infrastructure barrier among these farms (F1, F3, F5). F3 reported driving hundreds of miles in a day to get meat inspected and distributed, a process that proved unsustainable over time; he eventually discontinued the meat sales that required inspection.

Flexible, transportable on-farm infrastructure supported the small farmers in this study; F1 relied on recycled materials to construct transportable sheds and chicken huts, an approach that is economically sound, environmentally friendly, and easy to move throughout the season.

Technology

Access to appropriate and affordable technology was a barrier for some farmers, particularly those who were at least partially retired (F1, F3), but some innovations in environmentally friendly and small-scale technology also let these farmers meet their goals.

The most significant obstacle was that most agricultural technology, including tractors and balers, is designed for large-scale industrial applications. F1 was unable to grow and process feed for her goats and sheep because she was unable to find a baler to fit her small-scale needs; if the technology was available, she would be able to further reduce reliance on external inputs and close nutrient cycles on her farm.

On the other hand, technology allowed F3 to generate enough energy on-farm that his property operated at an energy surplus; he relied on solar energy technology to power on-farm activities, reducing reliance on fossil fuels. An electric tractor, powered by on-farm solar energy capture, allowed further avoidance of fossil fields; however, the company that produced the tractor went out of business and can no longer offer support for repairs, rendering the tractor useless in the event of malfunction.

Finally, online marketplace technology was critical to F4's local distribution hub, providing a pathway to expand the marketplace's customer base.

Access to natural ecosystems

Access to natural ecosystems is complicated by barriers of two types: insecure land tenure and increasing wildfire. The rising costs of land and increased conversion of agricultural land into residential communities make it difficult for farmers, especially young farmers entering the market, to secure ownership of farmland (F1, F2, F3, F4, F5). To farmers on leased land and owned land alike, recent regional increases in the frequency and intensity of wildfires pose a

threat. F1 was forced to evacuate her farm, animals in tow, during the historic Labor Day fires of 2020. F3 put out a grass fire that burned just a few acres of land about six years ago, and has since escalated fuel reduction activities in forested land on his property. Relatedly, F2 cited climate change as a driving factor behind increased production costs as water and energy bills go up.

However, creative land access arrangements and climate change-adapted land management strategies offer partial solutions to these problems; F5, leasing from a conservation-oriented nonprofit, bridged the gap between conservation and regenerative agriculture and fostered a meaningful relationship that may lead to longer-term land security in the form of a 10-year lease. F3 replanted his pasture with black oaks native to California, recognizing that decreased precipitation and increased temperatures may expand the species' range northward; doing so may support better outcomes for the trees and for the habitat they create.

Cooperation networks

Cooperation networks represent a significant enabler for the farmers in this study; all farmers reported engagement in some form of cooperation network, exchanging services, goods, land, information, or other resources. F1 grazes sheep on her neighbor's land in exchange for the invasive species control they offer, F2 borrows and lends equipment such as lawn mowers or welding equipment, F3 allows the testing of new feed mixes on his chickens, and F4 operates a distribution network that relies fundamentally on the participation of her colleagues. Each of these cooperation networks reduces the resource needs of individual farms and builds community relationships between producers, supporting the local advancement of agroecology.

Culture

Farmers in this study cited cultural barriers across a variety of areas. Those with children remarked that the younger generations had no desire to engage in or take over the family farm, making succession planning difficult (F2, F3). Others noted that younger generations are generally less inclined to go into farming, pointing to long, demanding hours, low financial reward, and poor job security as deterring factors (F1, F2, F3, F4, F5). The expectations and requirements that come along with farming made work-life balance difficult and sometimes unsustainable (F4, F5).

Cultural expectations around food pricing also create barriers; American consumers are accustomed to paying relatively low prices for food, as a proportion of total income, and are reluctant to pay high prices or to keep up with increasing costs of production (Leppert 2025). Many farmers stated that they struggled to sell food at the prices necessary to offset production costs because consumers weren't willing to pay those rates (F1, F3, F4).

Equity

The farmers in this study supported equitable labor practices by paying fair wages - well above minimum wage - and by working with nonprofits to expand low-income consumers' access to fresh local food (F4). Many farmers cited equity concerns related to labor; small farmers paying fair wages found it hard to compete with industrialized operations taking advantage of marginalized laborers (F1, F4, F5).

Key local barriers to agroecology and recommended approaches

These are key, location-specific barriers, identified from the synthesis of all five case studies: these barriers were mentioned by multiple farmers, have specific relevance in this region, and present important areas of focus for future efforts to support farmers.

Federal meat inspection requirements pose logistical difficulties.

Every farmer in these case studies mentioned the difficulties associated with federal meat inspection requirements in Oregon; some even cited these difficulties as the primary reason they stopped selling individual cuts of meat, or why they could never start in the first place (F3, F5). As of 2024, Oregon had only 13 USDA-inspected facilities, and most were at capacity (Figueroa, 2024). This made it difficult for new or first-time farmers to begin selling cuts of meat, because they often couldn't get a slot at one of these facilities; farmers were therefore restricted to selling live animals for slaughter (Figueroa, 2024; Gwin & Thistlethwaite, 2024).

> "If you can't bring it to harvest, then there's no sense in raising it. I would have beef and lamb here today if I wouldn't have had that issue, and that would have made me more economically sustainable and solvent."
>
> – F5 on meat processing bottlenecks.

The state has recently passed legislation targeted at supporting local meat sales; in 2022, the state brought back an inspection program, originally defunded in 1971, that is authorized to inspect meat processed and sold within the state (Oregon Department of Agriculture). The program currently has four enrolled inspection facilities, and an expected 10 to 12 will be in operation by the end of 2025 (Figueroa, 2024). However, funding to operate these facilities, specifically to pay the necessary inspectors, is insufficient; unlike any other food inspection program, USDA meat inspection requires that an inspector is present each day, rather than

annually or biannually (Figueroa, 2024). As a result, farmers still face delays in the meat inspection process. The Federal Farm Bill offers a 50% match for state-funded inspectors, meaning that the federal government will pay for a meat inspector for every two that the state funds (Friends of Family Farmers, 2025). Bill HB 2164, which would appropriate more money to the State Meat Inspection Program, did not pass in the 2025 legislative session (Friends of Family Farmers, 2025). Due to the demonstrated need for more inspectors, the existing infrastructure to support more meat inspection, and the federal funding available, funding more meat inspectors for the State Meat Inspection Program would be a meaningful step towards supporting local meat producers.

Land ownership is expensive and difficult to secure.

The difficulty of securing land access and ownership was universally cited by the farmers in this study. Farmers cited rising costs of land, increasing rates of urban development, and a lack of long-term security in lease agreements. Farmland real estate prices are increasing nationwide, but this trend is particularly pronounced in Oregon: data from the 2022 USDA Census of Agriculture reveal that Oregon's per-acre farm real estate value increased nearly 29% between 2017 and 2022, in comparison to the national average increase of 9.5% (Bigelow, 2024). The Willamette Valley, home to some of the state's most fertile soils, has average costs per acre of $20,000 or more (Bigelow, 2024).

Farmers also cited the expansion of Eugene's Urban Growth Boundary (UGB) as a factor contributing to difficult land access. The city's 2017 expansion into the Clear Lake area encompassed 924 acres of land, much of which was in agricultural use; the land remained zoned for agricultural use immediately after the expansion, with the potential for other uses with

property owner approval (City of Eugene, 2017). As a result of this expansion and those like it, land surrounding Eugene is increasingly in residential or commercial use, rather than agricultural use; farmers in this study reported that neighboring properties had been converted from farmland to housing in just the last decade (F1, F2).

> "Well, for anybody to get into a situation with arable land close to a population base, the cost is just getting more and more astronomical all the time. (...) There's no land security and that's painful for me on some levels for sure."
>
> – F2 on the prohibitive cost of land ownership.

Expanding access to farmland is a crucial focal point for local agriculture; while many barriers exist, farmers in this study also discussed helpful opportunities and novel approaches. Exclusive Farm Use zoning designation sets aside high-value land for agricultural use, protecting it from development; landowners who farm their EFU land receive a farm tax deferral (City of Eugene Planning Division, 2022). Maintaining the EFU designation for farmland surrounding Eugene is essential to supporting the small farmers that remain in the area; similarly, prioritizing the protection of agricultural land in any future UGB expansions will help these farmers stay on their land.

Some farmers in this study bought their land before prices were prohibitively high, others relied on long-term lease agreements, and still others relied on financial support from family and extended social networks. One novel approach involved the integration of regenerative agriculture with conservation; F4 operates a farm on land with a conservation easement owned by a nonprofit. 30 acres of the property are managed in agricultural production, and the remaining 62 are in riparian restoration, managed by the nonprofit. The long-term lease agreement provides less security than outright ownership, but this collaborative leasing arrangement models a creative approach to land tenure, working towards conservation goals

while also providing relatively stable land access to support local agricultural production. Future efforts to support land access, particularly in the context of agroecology and regenerative agriculture, may find success with similar models.

Wildfire poses an increasing threat to natural resources.

Wildfires in the Pacific Northwest have been larger, more frequent, and more severe in recent years (USDA Climate Hubs). Wildfires impact the agricultural sector in many ways; they pose dangers to human, animal, and soil health, and property values for farmland in and around burn zones can decrease significantly (Annan & Bigelow, 2025). Due to their already-precarious position, it may be that small local farmers are more vulnerable to the financial and environmental threats posed by wildfires. Multiple farmers in this study referenced personal experiences with wildfire, including emergency evacuations of livestock (F1) and the burning of forested property (F3).

> "I'm paranoid every time this hot wind's blowing from the north. (...) Five, six years ago we had a fire started from a mower on the highway. That's going to be hanging over our heads forever now, I suppose, just the possibility of a fire starting down there."
>
> – F3 on growing concerns over wildfire impacts.

Wildfire mitigation is a complex, multifaceted subject with increasing relevance in the coming years; a combination of forest management strategies, disaster response programming, public outreach and education, and post-fire financial support are required to address the growing risks.

Adaptation strategies in forest management can reduce the severity and intensity of wildfires; prescribed burns, forest thinning, and fuel breaks can increase forest resilience and protect valuable resources like farmland (USDA Climate Hubs). Recent federal funding may

support these management strategies: USDA Community Wildfire Defense Grant Program, which will invest $200 million in 58 projects targeted at improving forest and community resiliency; $57 million of these funds will be directed towards Oregon and Washington projects (USDA, 2025a; USDA, 2025b). By reducing overall wildfire risk in the state, these measures will also decrease wildfire risk for farmers.

Similar projects, however, have been defunded or not renewed; a $21.1 million mitigation project on rangelands in Eastern Oregon was defunded, and a critical grant to fund local disaster response was not renewed just before the 2025 wildfire season (Ehrlich, 2025; Figueroa, 2025). To best support farmers, especially those who operate locally, funding for mitigation, monitoring, and response initiatives is critical.

Post-fire disaster recovery support is available for Oregon farmers, including funds to recover losses from livestock and crop loss and to support the replanting of trees and forest restoration (USDA Farm Service Agency, 2024). Maintaining and increasing funding for these programs will support adequate financial assistance for farmers in the coming years.

Finally, outreach and education programs for farmers can help support individual farmers in developing wildfire preparedness measures and complying with wildfire safety regulations; an Oregon State University program, launched in 2023, offers a model for wildfire education (Oregon State University, 2024). The program led to increased spending on prevention measures and stronger feelings of preparedness among participants (Oregon State University, 2024). Education and outreach programs connecting farmers to resources and information may go a long way in navigating the increasing effects of wildfires.

Farmers are struggling to find interested successors and employees.

Every farmer interviewed in this study mentioned cultural barriers, namely those stemming from a lack of interest in farming from family members or potential trainees. Farmers with children reported that their children had no desire to work on the family farm, and farmers looking for employees and trainees found it difficult to find interested and compatible young people to employ.

> "Kids who grew up on farms generally don't want to farm. It's a rare kid who does. And so we have to bring the people who are unrelated to farming, but passionate about it onto the properties (...). It's difficult to live up to your ideals if you can't make enough scratch to pay your bills."
>
> – F2 on the generational divide in farming households.

Many metrics reflect the increasing difficulties that U.S. farmers face today. A historic trend of urbanization, in which residents move from rural farming communities to urban areas in search of work, contributed to population losses in rural America (Johnson, 2022). The agricultural sector has seen significant job losses in the last 50 years: farm workers accounted for 1.3% of total U.S. employment in 2021, down from 4.4% in 1969 (White & Leuven, 2023). Finally, most American farmers rely on off-farm income. In 2022, 84% of farm households earned at least half their income from off-farm sources, and more than half of family farms did not turn a profit; these data reflect the financial difficulty associated with farm ownership (Law, 2024).

The farmers in this study saw these trends reflected in their personal experience: they reported that prospective farmers were discouraged by the long hours and poor financial prospects associated with farm work. Their children or family members moved to urban areas

and had no interest in contributing to farm operations. This presents problems for succession planning, a factor mentioned by multiple farmers in these interviews.

Farm transfer or succession, in which aging farmers pass on property and responsibility to their children, is of central importance in the agricultural industry (Dill, 2025; Mishra et al., 2010) Succession is particularly critical in the family farming sector, determining how many farms operate and who owns them (Mishra et al., 2010). Intergenerational farm transfers can contribute to farm expansion but are difficult when economic conditions are poor; farm crises may force successors to find off-farm employment, making them unavailable to take over full-time farm operations (Mishra et al., 2010). As farming populations age and farm numbers decline, succession planning is becoming even more important (Dill, 2025).

In Oregon, the average farmer is 60 years old - and the majority don't have succession plans in place (Wallace, 2025). To ensure that agricultural lands without successors remain in production, farmers can work with land trusts to develop working lands conservation easements for their properties (Wallace, 2025). These agreements can protect farmlands from development and make them more accessible to young farmers - even if a farmer's own children are not interested in taking over.

Tackling the root cause of the succession problem, however, is more complicated. The interviewees in this study cited financial and work-balance issues as key factors driving away prospective farmers; these deeply established barriers may only be eased by a large-scale shift towards a more just and equitable food system such as the one envisioned by agroecology (Dumont, 2021).

Conclusion

This study of agroecology in Lane County revealed a diverse set of goals; many farmers, if not all, were primarily motivated by values other than the generation of profit. These farmers hoped to support healthy ecosystems, connect local consumers to the sources of their food, and encourage more people to start farming. Their practices reflected the ecological, economic, social, and political dimensions of agroecology. A focus on input reduction was central to most farming systems, and active habitat restoration took place on many. Every farm in this study sold products directly to consumers, and many used community-supported agriculture systems; in doing so, these farmers all forged direct connections with local consumers.

These farmers faced significant barriers, but they also modeled novel ways to approach these challenges. Access to land was cited as a notable barrier in almost every interview, but each farmer found a way to secure some kind of land tenure. One farmer had a leasing agreement with a conservation-oriented nonprofit: by operating on land with a conservation easement, this farmer simultaneously advanced environmental and agricultural goals. Through this collaboration, he also developed inclusive language to integrate the goals of conservation and agricultural production, paving the way for more partnerships of this kind.

Another novel approach supported inter-farm collaboration with a multi-farm distribution network; this internet-based platform expands consumer access to local food while also supporting relationships between farms. These creative approaches to food system change offer guidance to ease barriers and engage local communities, both critical components of the transition to agroecology.

This research documents activities and approaches across many levels of the agroecological transition as described by Gliessman et al. (2019). The first three levels, which

depend solely on field-level production practices, are accessed in a variety of manners. Farmers in this study drew from consumption reduction strategies found in the first level, alternative input choices from the second level, and even system-wide changes in the structure of production as described in the third level – examples include agroforestry and silviculture practices. The fourth level of the agroecological transition requires changes in consumer relationship and distribution strategies – farmers in this study accessed this level through CSA systems, farmstands, and a novel distribution network.

The fifth level of the agroecological transition can occur only after significant social, political, and economic changes take place in the larger food system. Producers in this study described several significant barriers that prevent the further advancement of the transition; these barriers act across levels, making action more difficult at lower levels and preventing it entirely at the fifth level. These barriers stem from political, economic, environmental, and cultural factors, but are united in that addressing them calls for large-scale changes. Necessary political changes include improvements to state meat inspection systems and support for working lands to avoid development. Environmental measures including wildfire mitigation efforts can ease stressors around the impacts of climate change. Economic support may include disaster relief, continued tax breaks for farmers on EFU land, and measures to improve consumer access to local produce. Finally, a cultural shift may be required to rejuvenate interest in rural farming and allow farmers to pass on their land and keep it in production.

These findings are informed by Lane County's culture, history, and climate, but they have significance beyond the area. They offer new directions and perspectives for local food systems in any area, including collaborative approaches to tackle existing barriers.

They illustrate the manifold ways in which farmers can incorporate goals and perspectives from agroecology, and they showcase the potential of agroecology to transform food systems in support of lasting positive change.

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