Can We Create Mission-Driven Enterprises That Last?

Scaling the Impact of Worker Cooperatives in Environment and Technology for Regeneration, Shared Prosperity, and Resilience

by

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Executive Summary

This Master's Project explores how worker cooperatives in the environmental and technology sectors can scale their impact to support regenerative economies, shared prosperity, and climate resilience. Worker cooperatives—enterprises owned and democratically governed by their workers—represent an alternative to extractive economic models that have contributed to deepening inequality, ecological degradation, and social disconnection. While these enterprises embody values aligned with long-term sustainability and democratic participation, they face significant challenges in achieving visibility, scale, and structural support.

Drawing on a mixed-methods approach—including a literature review, a survey of 14 cooperatives, interviews with nine cooperative members, and eight detailed case studies (with two highlighted)—this study examines the operational, structural, and ecosystem-level barriers that worker cooperatives encounter in the environmental and technology sectors. It identifies strategies that could support their growth without compromising cooperative values. Survey data and interviews revealed common challenges such as burnout, decision-making inefficiencies, limited access to capital, and the difficulty of translating democratic governance into scalable operations. At the same time, cooperatives emphasized nontraditional scaling approaches rooted in federation, replication, peer support, and ecosystem-building.

Environmental cooperatives often face regulatory and funding challenges despite delivering public environmental benefits, while technology cooperatives grapple with competition from venture-capital-backed firms and limited recognition of their climate relevance. Many technology co-ops did not initially identify their contributions to climate action—through ethical AI, data justice, and secure infrastructure—indicating a need for broader definitions and framing in sustainability research.

Findings suggest that scaling worker cooperatives requires sector-specific policy tools, shared infrastructure, housing and financial anchors, and cross-sector cooperative ecosystems. Biomimicry—particularly models such as murmuration and myxobacteria—emerges not only as a metaphor but as a practical blueprint for cooperative growth: decentralized, responsive, and values-aligned. These natural models offer strategic guidance for how environmental and technology cooperatives can scale together. Technology cooperatives can create tools and platforms that emulate ecological systems—enabling sensing, signaling, and coordination across networks—thereby amplifying the impact of environmental practitioners. In doing so, they also provide ethical alternatives to extractive technologies, reinforcing shared commitments to climate justice, transparency, and democratic governance.

The study concludes with recommendations for public, private, nonprofit, and academic actors to support cooperative development and outlines future research directions to expand the cooperative ecosystem as a critical component of just and regenerative economies.

Acknowledgments

This project has been a journey shaped by the belief that sustainability is impossible without equity. Equity strengthens us across affiliations and boundaries—and it's the foundation of this work. Though it can feel counterintuitive, nature reminds us that resilience comes through cooperation, not hierarchy, and that solutions often live within the problems themselves, if we take time to look. For that, and for the countless lessons still unfolding, I am deeply grateful to nature—our constant and humbling teacher.

Against all practical advice, I focused my time at Duke on something that doesn't directly align with my day job. But by studying how systems—people, structures, and values—intertwine, I believe this work connects to every role we hold now and in the future.

I am grateful to Dr. Rebecca Vidra, who gave me the space to let this project grow where it needed to and encouraged me to focus on understanding the barriers—giving me a way into the heart of the problem, rather than scoping a broader, less grounded topic. Her trust and steady confidence made all the difference. I am also thankful to Dr. Kerry Ossi-Lupo for her wise advice, cheerful support, and willingness to carve out time—even on weekends—to help me work through ideas when needed.

I am grateful to my employer, the City of Los Angeles, and to the City itself—for offering the real-world complexities that made the urgency of this work so clear. I'm especially thankful to my management and those who supported my return to school with their letters and encouragement. Your belief in this journey meant more than you know.

This project would not have been possible without the generosity of the worker cooperatives who shared their time, insights, and lived experiences. I felt honored to learn from heroes working across the environmental and tech worlds. Thank you also to those who opened their networks even if they couldn't personally participate. Speaking with prosocial optimists across the U.S. and U.K. filled me with hope. I conducted eight case studies for this project, though I could only highlight two here—I wish I could lift up all their stories.

I am fortunate to be part of the DEL Program at Duke and grateful to the faculty and cohorts—past, present, and future—whose passion and talent make facing the planet's challenges a little less daunting.

Finally, thank you to my family. To my husband, Philip—thank you for your patience, your writing advice, and for being my personal coach and chef. And to my son, Ben Oak—thank you for your understanding, your music, and your humor, all of which carried me through more moments than you know. To my mom, Lita—thank you for always modeling possibility and optimism, even in the face of obstacles. The grace you all gave me, especially when I wasn't always available, made this project possible in ways both large and small. And to my late-night writing companion, our sweet dog Mr. Rigby, thank you for staying close through the long, quiet hours.

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1. Introduction

1.1 Problem Statement

Can we create mission-driven enterprises that last?

The answer is a resounding yes—but only if we rethink the systems that have led us to the crises we face today. Climate change, rising inequality, and the unchecked power of data monopolies expose the structural failures of an economic model rooted in short-term profit, centralized control, and relentless competition (Fischer-Kowalski, et al., 2011; Demaria, 2018; Couldry & Mejias, 2019; Lavie, 2023). These converging challenges cannot be addressed through isolated reforms. They demand a fundamental shift toward models that prioritize cooperation, shared ownership, and long-term resilience. Without systemic change, sustainability efforts will remain inadequate—particularly for frontline communities disproportionately burdened by ecological and economic injustice (Lavie, 2023).

1.2 Significance of the Study

Despite growing global commitments to sustainability, dominant economic systems remain locked in fossil fuel dependency, overconsumption, and linear production models. Alternative frameworks like degrowth and decoupling offer systemic critiques but face limited implementation due to weak political will, insufficient equity considerations, and lack of mainstream traction (Fischer-Kowalski, et al., 2011; Demaria, 2018). Meanwhile, global consumption patterns continue to exceed planetary boundaries, disproportionately harming low-income and frontline communities least responsible for ecological degradation.

Traditional capitalist models fail to build resilience; instead, they deepen social inequality and accelerate resource depletion. Fossil-fuel-driven growth externalizes environmental and social costs onto marginalized populations (Lavie, 2023). In tech and gig economies, corporate profits surge while workers face growing job insecurity and stagnant wages. Centralized economic power undermines community agency and reinforces structural exclusion (Birchall & Ketilson, 2009).

The rise of Big Tech has reshaped both markets and governance, intensifying consumption, eroding privacy, and weakening democratic oversight (Couldry & Mejias, 2019). Platform giants—Apple, Amazon, Alphabet, Meta, and Microsoft—consolidate power by controlling

infrastructure, data, and innovation (Swabey, 2021; Lavie, 2023). Their algorithm-driven systems shape public discourse while outpacing regulatory capacity (Lavie, 2023).

These dynamics threaten labor rights, environmental sustainability, and democratic governance. Exploitative gig work, extractive digital supply chains, and invasive data practices directly conflict with the Sustainable Development Goals (SDG 3, 12, and 16) (Lavie, 2023). Without structural accountability, the current technology-driven economic system will continue to concentrate wealth, externalize harm, and reinforce systemic injustice.

1.3 Nature-Inspired Economic Models

Nature offers a powerful alternative to extractive economies—one where competition and cooperation exist in dynamic balance (Maximino & Soares, 2021). While competition may drive adaptation, mutualism enhances survival (Feeney et al., 2019; Beaudrot et al., 2020). One-celled bacteria swarm when resources are scarce; starlings move in murmuration by sensing nearby neighbors; ostriches and zebras combine visual and auditory strengths to detect predators (Kiniry, 2023). These behaviors show that resilience often stems not from individual dominance, but from collective adaptation and complementary relationships.

In contrast, human economies tend to overemphasize competition, promoting market rivalry as a path to innovation. In practice, this has concentrated power in monopolies, marginalized cooperative (co-op) enterprises, and ignored ecological limits. Yet ecosystems—from soil-dwelling microbes to skybound birds—demonstrate that decentralized coordination, not hierarchy, fosters adaptability and resilience (Bialek et al., 2012; Cao et al., 2015; Muñoz-Dorado, et al., 2016).

These principles extend beyond biology. Political economist Elinor Ostrom famously challenged the “tragedy of the commons” narrative, which suggests shared resources are inevitably depleted by individual self-interest (Hardin, 1968; Morton, 2021). Through empirical research across continents, Ostrom (1990) demonstrated that communities can and do successfully govern shared resources through cooperation, adaptive rules, and social trust—often outperforming market or state control (Ostrom, 2012; Nordman, 2021).

Indigenous cultures also exemplify long-term, cooperative economic models grounded in kinship and stewardship. The Haudenosaunee Confederacy practiced consensus-based governance guided by the Seventh Generation Principle: “In our every deliberation, we must consider the impact of our decisions on the next seven generations” (Park, Wilcox, & Ineese-Nash, 2023). In

the Andes, ayni—reciprocal labor and mutual aid—prioritizes relational well-being over individual gain (Valdivia, 2020). In West Africa, the Yoruba esusu system provides rotating community-based financial support, particularly for those excluded from formal banking (Osiki, 2020). Indonesia's gotong royong encourages shared labor and responsibility, reinforcing intergenerational resilience (Humaedi et al., 2025). Across continents, these traditions show that sustainable economies are rooted in reciprocity, care, and collective strength—anchored by long-term thinking and responsibility to future generations.

These models remind us that economic alternatives are not hypothetical—they are ancestral, place-based, and still practiced today. Worker cooperatives, as contemporary expressions of these values, can help carry this legacy forward.

2. The Case for Worker Cooperatives

2.1 Definition, Principles, and Historical Context

Worker cooperatives are businesses owned and democratically governed by their employees, who share both decision-making authority and financial returns. Unlike consumer or producer cooperatives, worker cooperatives place control and profit directly in the hands of those performing the labor. This structure advances equity, accountability, and long-term investment, offering a practical alternative to traditional business models—particularly in the face of growing environmental, economic, and social challenges (Cheney et al., 2014).

The origins of worker cooperatives date to mid-19th century England, where industrial laborers established mutual aid societies in response to exploitative working conditions. The most influential of these was the Rochdale Society of Equitable Pioneers, founded in 1844 by a group of weavers. Their model introduced a democratic governance structure based on seven core principles, which were later adopted by the International Cooperative Alliance (n.d.) and now serve as the foundation for cooperative identity and operations across sectors and regions. The principles are:

1. Voluntary and open membership
2. Democratic member control
3. Member economic participation
4. Autonomy and independence
5. Education, training, and information
6. Cooperation among cooperatives

7. Concern for community

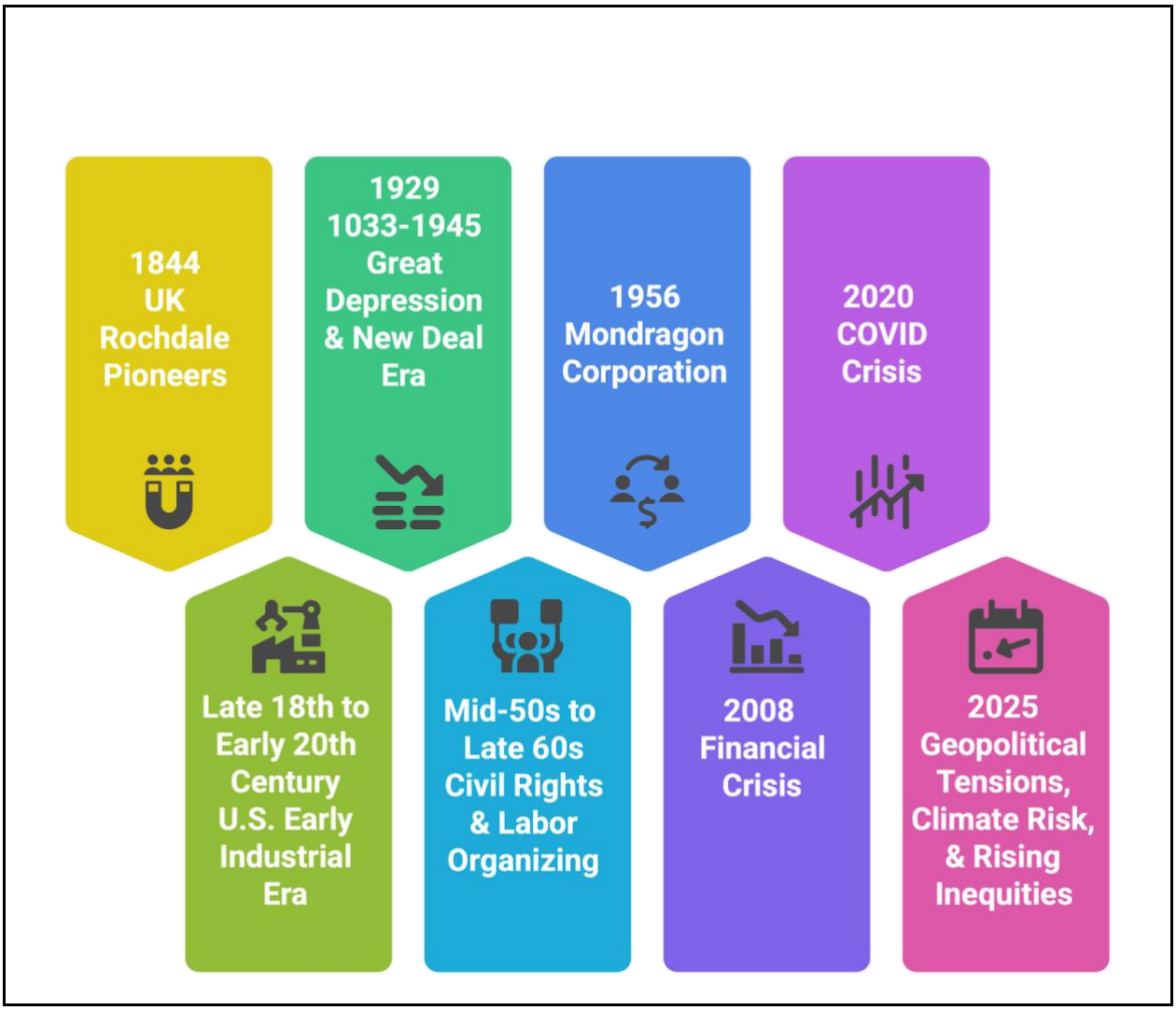
These principles have endured for nearly two centuries, providing a resilient framework through periods of economic and social upheaval. From the Industrial Revolution and the Great Depression to the civil rights era and the COVID-19 pandemic, cooperatives have often stepped in to offer community-based, equity-driven solutions where conventional systems failed or withdrew (Birchall & Ketilson, 2009; Gordon Nembhard, 2014; Cocking, et al., 2023; Mangan & Ward, 2023). In the United States, the Knights of Labor supported cooperative development in the late 19th century as a response to growing industrial inequality (Curl, 2012). Although many early cooperatives were short-lived due to limited legal protections and access to capital, they laid the groundwork for a worker ownership tradition that has persisted and evolved (Figure 1).

One of the most prominent examples of modern cooperative success is the Mondragon Corporation, founded in the Basque region of Spain in 1956. Mondragon has expanded into one of the world's largest cooperative federations, employing tens of thousands of worker-owners across sectors, including manufacturing, finance, and education. Its scale and longevity demonstrate the viability of worker cooperatives in highly competitive and complex markets (Whyte & Whyte, 1991).

In the United States today, worker cooperatives remain a small but growing segment, primarily concentrated in industries such as food services, care work, and construction (Democracy at Work Institute & U.S. Federation of Worker Cooperatives, 2023). Despite their documented benefits—including enhanced job quality, equitable governance, and local economic resilience—worker cooperatives face significant scaling barriers. These include limited access to startup capital, technical assistance, and public awareness. As climate disruption, widening inequality, and democratic backsliding intensify, worker cooperatives offer not only renewed relevance but a concrete pathway toward building more inclusive and sustainable economies.

Figure 1

Key Milestones in Cooperative and Economic History



2.2 Economic Performance and Equity

Worker co-ops balance *mission and margin,* not *mission or margin*. According to the *2023 Worker Cooperative State of the Sector Report* by the Democracy at Work Institute and the U.S. Federation of Worker Cooperatives (2023), the median worker cooperative generates over $600,000 in annual revenue with lean operational teams—typically composed of just six worker-owners. Notably, 79% of these cooperatives are fully worker-owned, eliminating absentee investors and ensuring that profits are reinvested into the enterprise and the surrounding

community. This reinvestment contributes to greater organizational performance, commitment, and member loyalty (Democracy at Work Institute & U.S. Federation of Worker Cooperatives, 2023).

The report also highlights a significantly more equitable pay structure within worker cooperatives. On average, the pay ratio between the lowest- and highest-paid workers is 1:1.45, in stark contrast to the 1:344 ratio common in conventional businesses. Such wage equity fosters morale, workforce retention, and long-term resilience. When workers hold ownership, they are more likely to invest their labor, time, and vision into the cooperative's success.

Furthermore, the report notes that over 60% of existing worker cooperatives have been founded within the past 15 years, indicating growing interest in more democratic and inclusive economic models. This trend reflects a broader societal shift: rather than waiting for equity to be delivered from the top down, individuals and communities are actively constructing it from the ground up. Worker cooperatives, in this sense, offer a viable blueprint for a more just and resilient economy.

2.3 Gaps in Visibility and Support

Despite this track record, cooperatives continue to face challenges in public awareness and perception. As Anu Puusa, a leading expert in cooperative economics and Vice President of the Board at Cooperatives Europe, emphasized in her TED Talk (2021), many people remain unfamiliar with the cooperative model or underestimate its viability as an alternative to traditional corporate structures. This perception gap limits their expansion and mainstream acceptance.

A primary contributor is the lack of cooperative economic models in business education, where capitalist frameworks dominate (Matten, 2014). Many—particularly younger generations—are unaware that cooperatives offer scalable solutions to social and environmental challenges (Mussolini, 2024; The Alternative, 2023). And those who are aware and interested often face barriers to entry, such as limited access to capital, regulatory complexity, and a lack of technical guidance. Meanwhile, existing co-ops often struggle with operational optimization and scaling strategies.

This growing disconnect between the potential of cooperatives to help solve environmental issues and economic inequalities, and their mainstream visibility underscores the need for renewed attention, advocacy, and structural support.

3. A Timely Opportunity

3.1 The United Nations International Year of Cooperatives

The United Nations (UN) has renewed a global call to action by designating 2025 as the International Year of Cooperatives under the theme *Cooperatives Build a Better World*. This announcement follows its 2009 declaration of 2012 as the first International Year of Cooperatives and McKinsey's inaugural *McKinsey on Cooperatives* report, which responded to the 2008 financial crisis. Yet despite these milestones, governments, institutions, and movements have made only limited progress in raising awareness or scaling cooperative models. The 2025 designation creates a pivotal opportunity to reverse that trend. Global actors can now elevate cooperative economics as a practical and transformative strategy to confront the interlinked crises of climate change, inequality, and economic instability (Upadhya, 2021).

3.2 Relevance to Climate and Economic Crises

Worker cooperatives in environmental and technology services play a critical role in advancing climate action, equity, and resilience by embedding justice and sustainability into their core operations. From green infrastructure and zero-waste logistics to open-source climate platforms and ethical AI, these enterprises align ecological goals with democratic governance. Scaling worker cooperatives in sectors such as community-owned renewable energy, green building, and circular supply chains ensures that climate solutions generate shared prosperity—rather than concentrating returns among investors (Geskus et al., 2024).

Moreover, expanding worker cooperatives helps democratize the green transition by giving historically excluded groups—such as low-income, Indigenous, and frontline communities—greater influence over decision-making. By broadening participation and distributing ownership, cooperatives challenge extractive systems and prevent the consolidation of wealth and power in emerging climate industries. In doing so, they support a more just, regenerative, and resilient future (Jenkins et al., 2016).

Countries such as Spain (Mondragon Corporation), Italy (Emilia-Romagna's cooperative economy), and the United States (Union Co-op Model) demonstrate that large-scale worker cooperatives can effectively integrate ecological and economic goals while fostering inclusive development (Sterling, 2010; Birchall, 2011; Romeo, 2022).

Yet, systemic barriers persist. Worker co-ops continue to face limited access to capital, restrictive procurement and regulatory systems, and inadequate visibility in business education. This Master's Project (MP) investigates the shared and sector-specific barriers facing environmental and technology-focused worker cooperatives and explores strategies to scale their impact for regeneration, resilience, and shared prosperity.

4. Research Questions

By centering on worker cooperatives in environmental services and technology, this research investigates three core questions:

1. What barriers prevent worker cooperatives in environmental services and technology from scaling their impact?
2. How do these barriers vary by sector?
3. What strategies can help overcome them?

In answering these questions, the study aims to inform the development of a cooperative economy in these sectors—environmental services and technology—capable of confronting the intertwined challenges of climate risk, resource exclusion, and democratic erosion driven by data monopolies.

5. Methodology

5.1 Mixed-Methods Design

This study employed a mixed-methods research design, incorporating literature review, surveys, interviews, and case studies to investigate barriers to scaling worker cooperatives in the environmental and technology sectors (Archibald, 2023). Surveys helped identify operational and structural challenges, interviews provided deeper insights into cooperative dynamics, and case studies contextualized real-world strategies for growth and impact. Collectively, these methods allowed for an integrated understanding of cooperative scalability and contributions to equitable climate solutions (Molina-Azorín, 2016; Adu et al., 2022).

AI (ChatGPT) was used as a supplementary tool during the research design phase to generate initial drafts of survey, screening, and interview questions (Parker, Richard, & Becker, 2023; Salah et al., 2024). These drafts drew on cooperative literature and incorporated best practices in social science research formats, including Likert scales and open-ended response types. All content underwent multiple rounds of revision by the author to ensure alignment with study

objectives, reduce bias, and enhance clarity (Parker, Richard, & Becker, 2023; Salah et al., 2024).

The final study design, including participant recruitment, consent procedures, and data collection instruments, was reviewed and approved by Duke University's Campus Institutional Review Board (IRB Protocol #2025-0160). Amendments were submitted and approved to allow more flexible participation options, such as asynchronous interviews via email or secure Qualtrics forms. The Institutional Review Board (IRB) also approved revisions to ensure consent materials accurately reflected study duration, data usage, and the conditional public use of any audio, video, or photographic materials. Public dissemination of identifiable media required a separate signed release. All research instruments were pilot-tested prior to deployment to ensure clarity and ethical soundness. A sample of AI-generated prompts used in early drafts is included in Appendix A.

5.2 Participant Selection and Outreach

Worker cooperatives in environmental and technology services were identified through the United States Federation of Worker Cooperatives (USFWC) directory and targeted web searches using keywords such as "environmental worker cooperative," "tech worker cooperative," "platform cooperativism," "worker cooperatives climate action," "worker cooperatives resilience planning," and "worker cooperatives as alternatives to Big Tech," among others. Additional cooperatives were recruited through snowball sampling.

A broad and inclusive definition of environmental and technology services was adopted to reflect the diverse and interdisciplinary nature of climate-focused cooperative work. This approach enabled the inclusion of cooperatives with environmental or climate-adjacent missions, even if not explicitly labeled as such.

Outreach efforts included personalized emails targeted for each sector with survey links sent via Qualtrics or from the author's Duke University email account. A total of 114 cooperatives were contacted. Recruitment messages were also shared in ten USFWC Slack channels, though these channels yielded limited engagement. Outreach email and forum posts were developed and refined by the author for tone and clarity (Appendices B and C). All outreach materials received IRB approval.

5.3 Screening and Eligibility

Eligibility was determined through a screening questionnaire, especially for participants recruited through public-facing platforms. The questionnaire confirmed that participants were:

- Affiliated with a worker cooperative
- Operating in one or more of the target sectors
- Engaged in work related to climate action or equitable sustainability

Questions were designed to be brief, accessible, and effective in identifying participants aligned with the study scope. Final versions received IRB approval (Appendix D.1).

5.4 Survey Design and Data Collection

The online survey, estimated to take 15–20 minutes, gathered both quantitative and qualitative data. It explored:

- Operational and structural challenges
- Climate-related services and impacts
- Governance and decision-making processes
- Cooperative support systems and networks
- Scaling strategies and reflections on cooperative growth

Survey questions were developed and refined by the author based on the study's objectives and aligned with established social science formats, including Likert scales and open-ended response types (Appendix D.2). The survey concluded with demographic and background questions including geographic location, tenure, age, motivation, and an optional racial or ethnic identity question. Informed consent was required prior to participation. Responses were analyzed using descriptive statistics and thematic coding to guide the development of interview and case study components.

5.5 Interviews and Case Studies

At the end of the survey, participants were invited to complete a follow-up interview. To reduce barriers to participation, both synchronous (Zoom-based) and asynchronous (written response) formats were offered. This alternative format was approved through an IRB amendment and increased participation rates. Interview questions were developed to reflect sector-specific themes and refined by the author based on initial survey findings (Appendices D.3 and D.4).

Participants who completed both the survey and interview were invited to a virtual case study session. These sessions, conducted via Zoom, used a semi-structured format to delve deeper into cooperative strategies, organizational development, and cross-sector collaboration. Eight worker cooperatives engaged in all three phases: survey, interview, and case study.

6. Results

6.1 Participation Overview

The survey yielded 14 completed responses out of 114 invitations. The responses included:

- from tech or tech-adjacent worker cooperatives
- 3 from environmental worker cooperatives
- 2 from “other” sectors—one in waste hauling and the other in landscape/land use planning and design—were reclassified under environmental worker cooperatives due to the nature of their work.

The interviews included nine participants, including two members from the same cooperative. In total, the interviews involved eight worker cooperatives—five in the tech sector and three in the environmental sector—all of which agreed to participate in case studies.

Participants represented a range of roles within climate-focused worker cooperatives. Environmental cooperatives included those engaged in waste hauling and resource recovery, climate planning and environmental consulting, and design-build practices involving sustainable architecture, regenerative landscaping, and green infrastructure, such as rainwater harvesting, urban tree planting, and habitat restoration. These members worked at the intersection of ecological restoration, climate adaptation, and social equity. In the tech sector, participants included technologists, data analysts, researchers, and facilitators who developed digital infrastructure, open-source platforms, and sustainability-focused software to support environmental monitoring, community organizing, and worker-led enterprises (Table 1).

Table 1

Summary of Study Participants

	Environment	Technology	Totals
Surveys	5	9	14
Interviews	3	6	9
Case Studies	3	5	8

6.2 Survey Findings

This section synthesizes survey data from 14 worker cooperatives across the environmental services and technology sectors. Results are presented by theme, integrating interpretation with findings to clearly understand shared and sector-specific dynamics.

6.2.1 Cooperative Profiles and Growth Stages

Surveyed cooperatives were predominantly small, with most reporting 1–10 members. While both sectors reflected operational maturity, environmental cooperatives tended to be older and more established, often operating for over a decade. In contrast, technology cooperatives showed greater diversity in age, with several in early growth stages.

These patterns suggest that environmental co-ops may prioritize stability and continuity, while tech co-ops are more frequently navigating expansion (Figures 2 to 4).

Figure 2

Cooperative Age

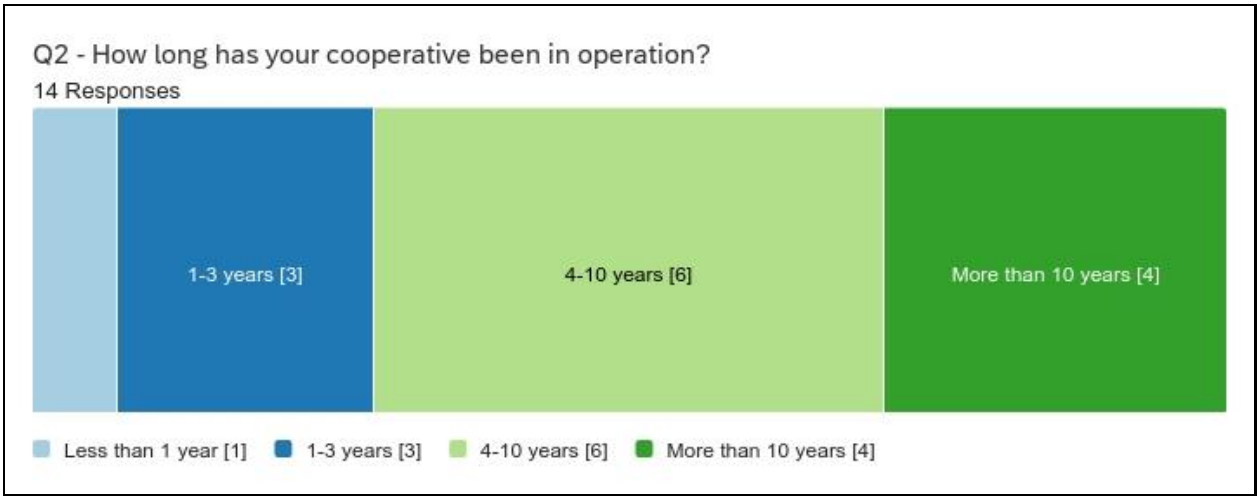


Figure 3

Cooperative Size

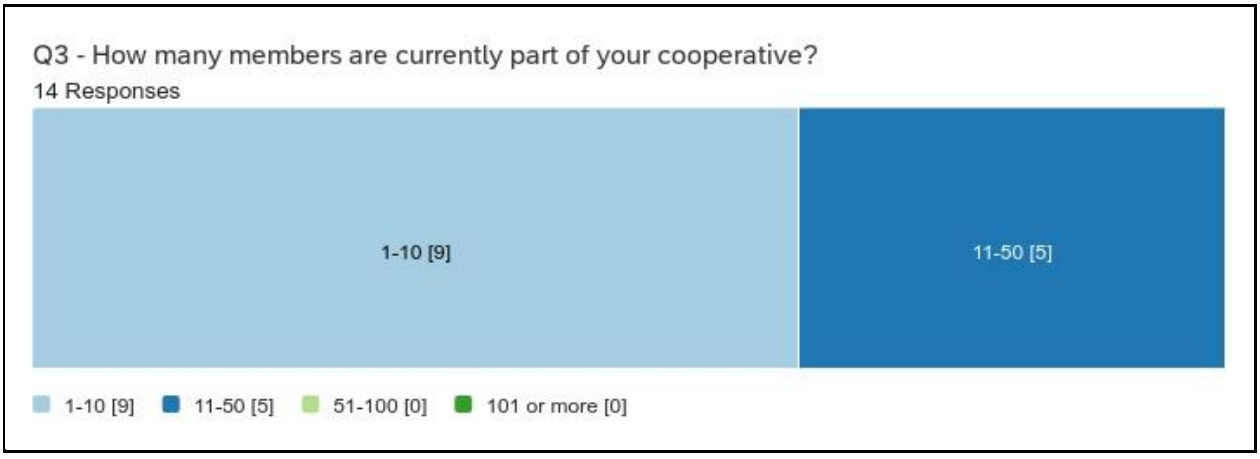
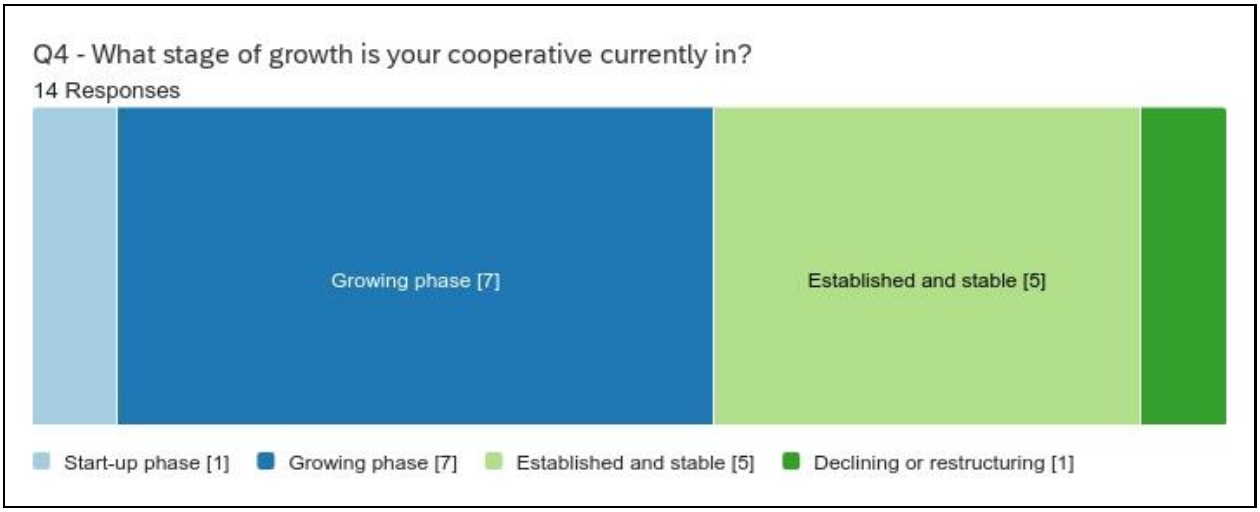


Figure 4

Growth Stage Distribution



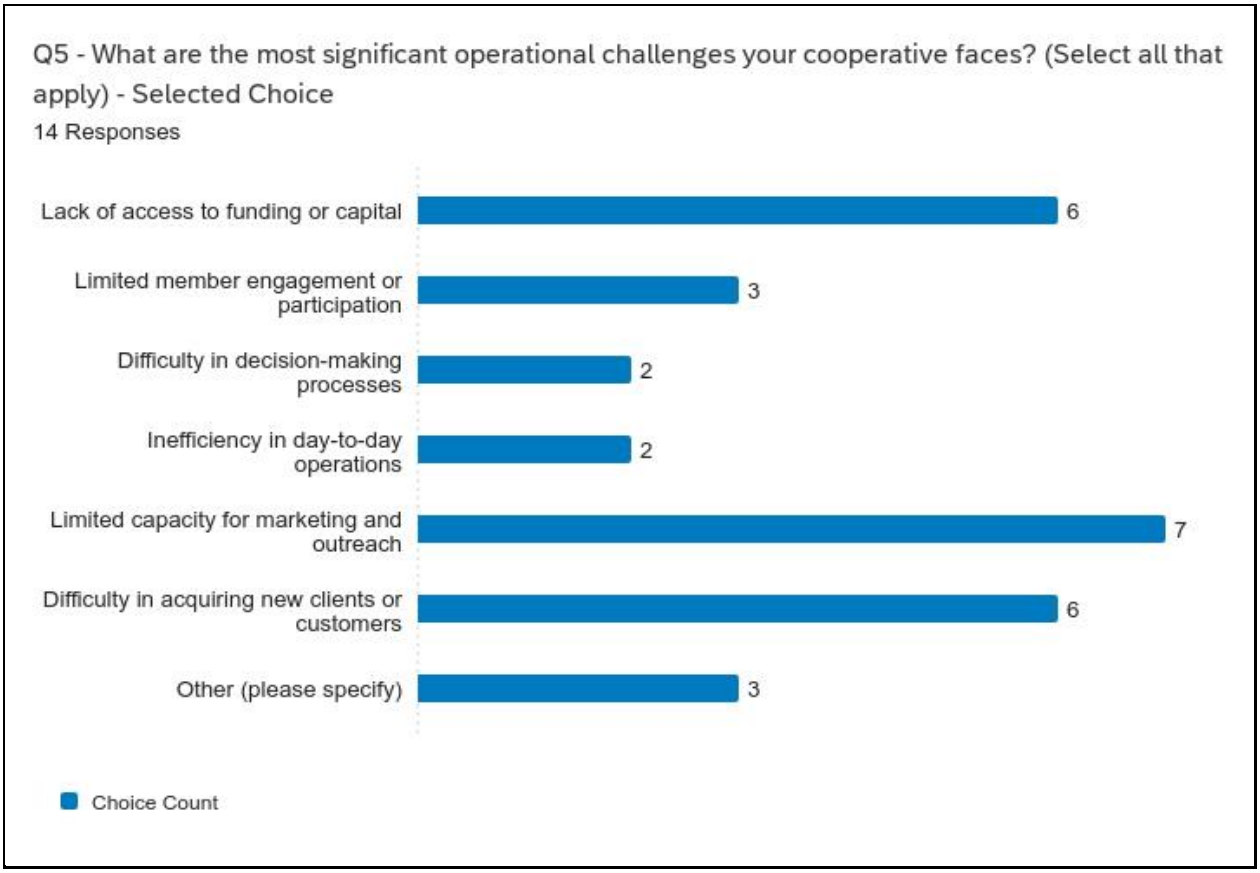
Note. Figures 2 to 4 highlight environmental and technology cooperatives' relative maturity and lean size.

6.2.2 Operational and Governance Challenges

Across sectors, key operational constraints included limited internal capacity, burnout, and challenges in marketing and client acquisition (Figure 5). Environmental cooperatives cited overburdened skilled members and high turnover, sometimes due to cost-of-living pressures, while technology cooperatives struggled with saturated markets and internal decision-making inefficiencies. No cooperative reported being entirely unaffected by operational challenges. These results point to a shared experience of recurring—but not constant—operational constraints across both sectors.

Figure 5

Operational Challenges

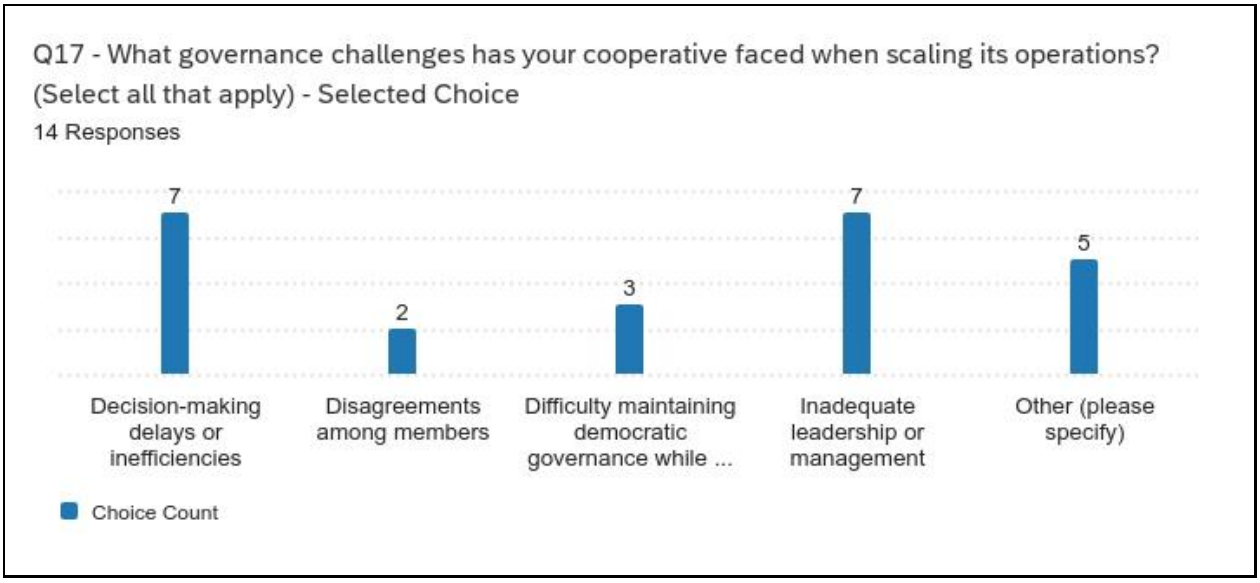


Note. This visual emphasizes that both sectors experience limited marketing capacity and face challenges in acquiring new clients and accessing funding or capital.

Most respondents reported governance challenges—particularly decision-making delays and leadership gaps—though satisfaction levels were generally moderate to high. Environmental co-ops emphasized cultural and language access issues; tech co-ops faced coordination challenges in distributed teams. These findings suggest that while cooperative governance remains functional, scaling introduces stress points that require adaptive capacity and leadership development (Figures 6 and 7).

Figure 6

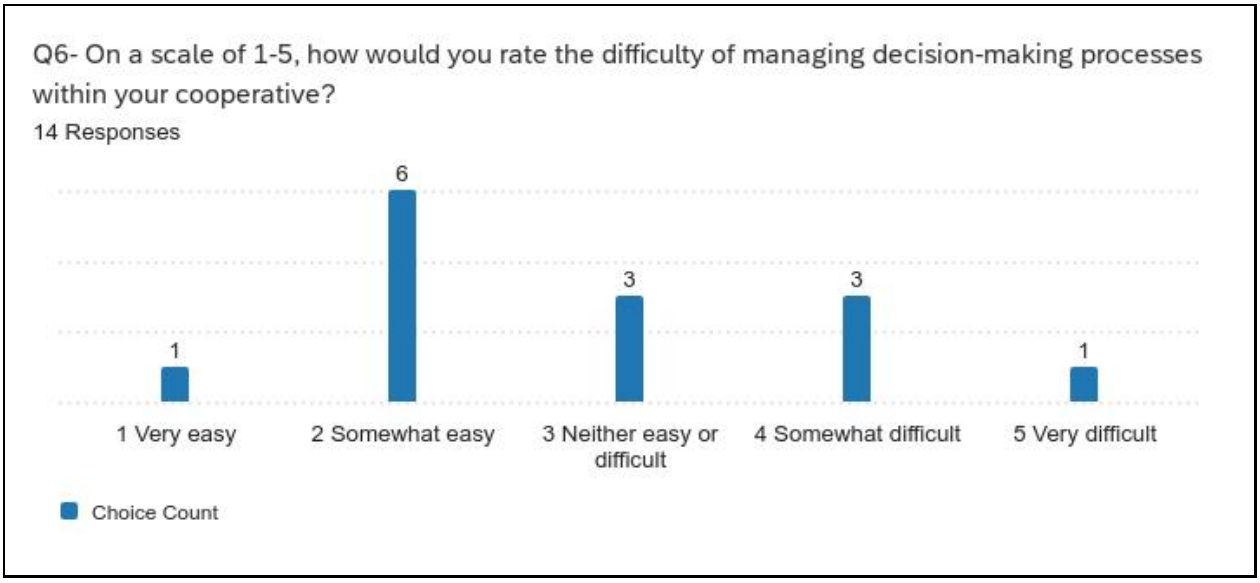
Governance Challenges When Scaling



Note. The charts illustrate that leadership gaps and decision-making delays become more pronounced as cooperatives scale.

Figure 7

Satisfaction with Decision-Making



Note. The charts illustrate that despite reported friction, most co-ops express moderate to high satisfaction with governance.

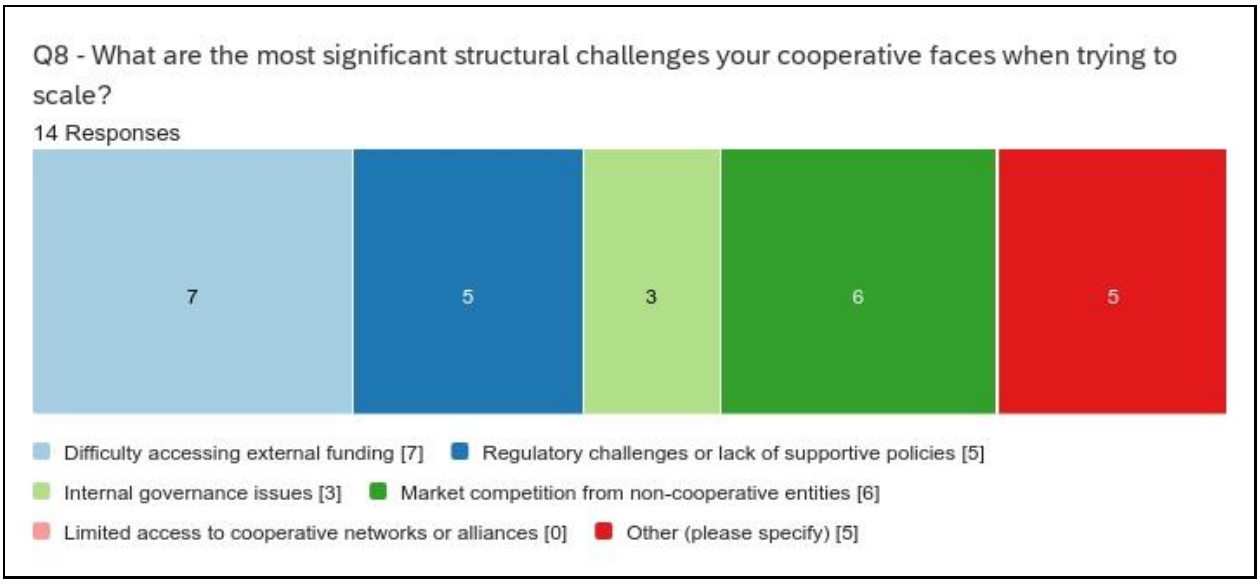
6.2.3 Structural Barriers to Scaling

Both sectors cited systemic misalignments with dominant economic and policy frameworks. The most significant barriers included limited access to capital, difficulty competing with conventional firms, and policy environments that fail to accommodate cooperative models (Figure 8).

Environmental cooperatives often chose to remain small and mission-focused, while technology cooperatives expressed frustration with venture-driven norms that marginalize alternative ownership structures. Despite these challenges, some respondents viewed cooperative governance as an asset—highlighting both the promise and limitations of the model in scaling contexts.

Figure 8

Structural Barriers (Capital, Policy, Market)



Note. This figure clearly presents the top three barriers that limit cooperatives from scaling under current conditions.

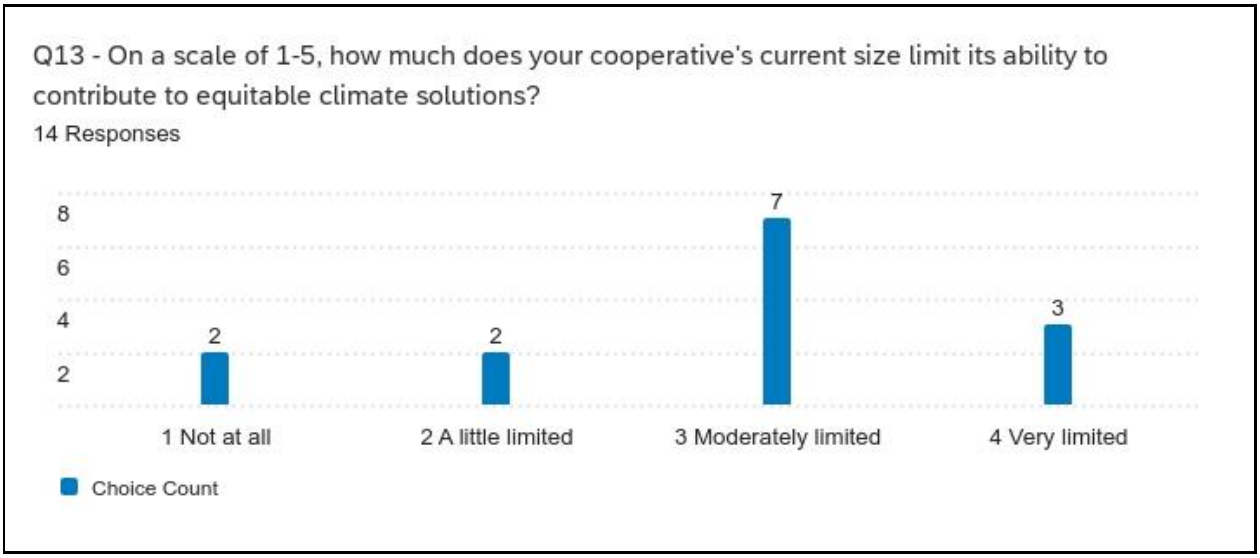
6.2.4 Barriers to Climate Impact

Most environmental cooperatives identified climate action as central to their mission, yet cited constraints such as insufficient staffing, slow growth, and lack of infrastructure to deliver larger-scale impact. Technology cooperatives demonstrated more variable alignment, with some

engaging indirectly in climate work and others limited by dependencies on unsustainable infrastructure. Across both sectors, funding shortfalls, capacity gaps, and incompatible regulatory frameworks emerged as barriers to contributing meaningfully to equitable climate solutions. Open-ended responses also point to inability to scale without compromising values (Figure 9).

Figure 9

Perceived Limitations on Climate Impact by Co-op Size



Note. This chart illustrates that 10 of 14 co-ops feel their current size limits climate impact, with tech co-ops showing greater structural dependencies.

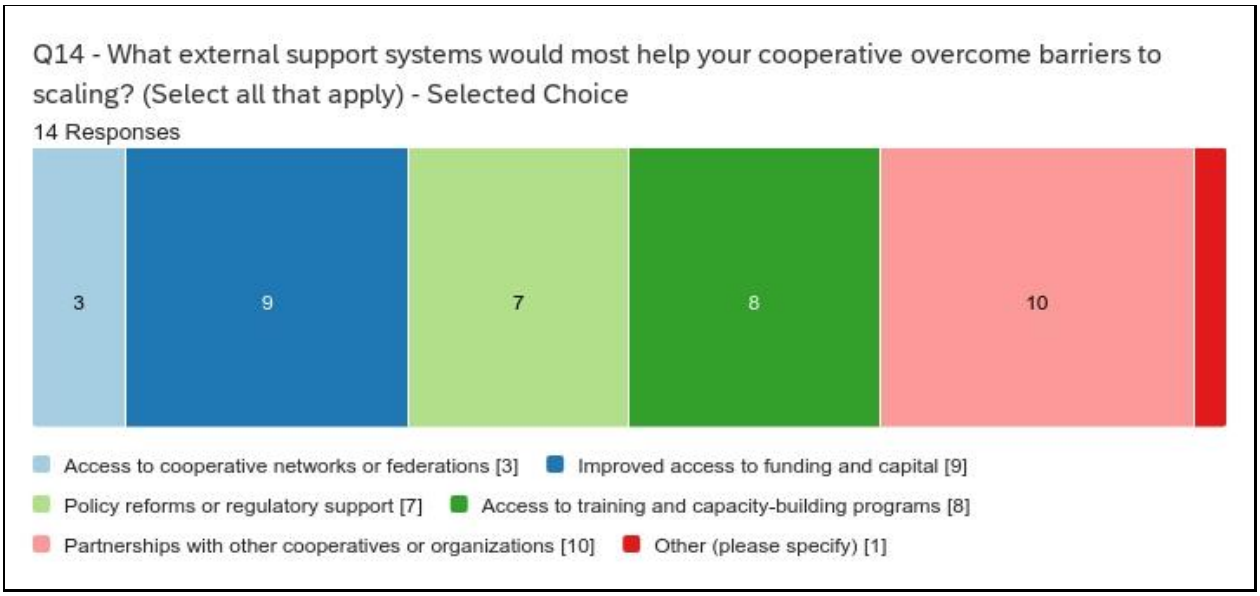
6.2.5 External Support Needs

Cooperatives across sectors expressed a clear demand for external support systems that are better resourced, more targeted, and sector-specific. The most frequently cited supports included access to capital, partnerships with aligned organizations, training and capacity-building, and policy reform (Figure 10).

While all cooperatives had engaged with cooperative networks, only a minority found these engagements to be substantively helpful, signaling a gap between values-based affiliation and operational support (Figure 11).

Figure 10

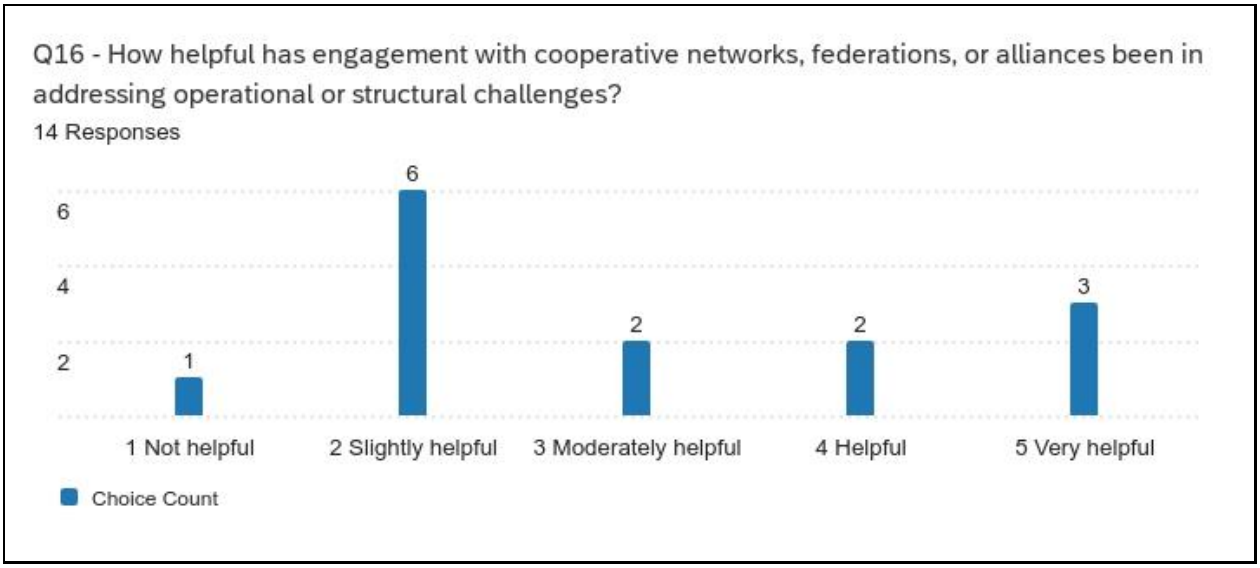
Preferred External Supports for Scaling



Note. The diagram underscores the high demand for partnerships and funding, followed by training and regulatory support.

Figure 11

Role of Cooperative Networks in Overcoming Challenges



Note. The diagram highlights the importance of sector-specific support mechanisms tailored to the distinct needs of environmental and technology cooperatives.

6.2.6 Member Motivations

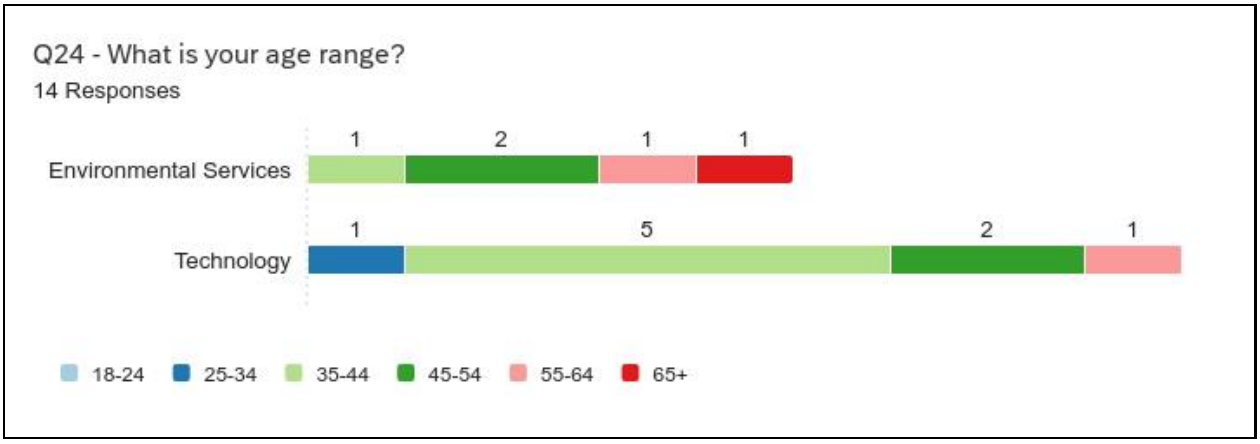
Respondents across both sectors expressed strong motivations rooted in values alignment, autonomy, and dissatisfaction with conventional employment. Environmental co-op members often emphasized ecological principles and global cooperative networks, while tech co-op members cited disillusionment with hierarchical workplaces and a desire for peer collaboration. These motivations reflect a broader critique of dominant economic models and a commitment to building democratic, community-centered alternatives.

6.2.7 Age Demographics

The sample skewed toward mid- to late-career professionals, with most respondents between ages 35–54 and none under 25. This distribution suggests that cooperative engagement often follows prior experience in other sectors. It also raises questions about succession planning and the need for intentional strategies to engage younger generations in cooperative work (Figure 12).

Figure 12

Age Distribution by Sector



Note. This figure highlights the absence of under-25 respondents and reinforces the need for intentional intergenerational strategies.

6.3 Interview Findings

Interviews with worker-owners from environmental and tech cooperatives added depth to the survey data, revealing day-to-day realities behind cooperative governance, structural barriers, and climate contributions.

6.3.1 Operational and Governance Challenges

Environmental and tech cooperatives alike cited internal capacity limits and governance friction as persistent constraints. Small team sizes lead to role overlap, burnout, and difficulty onboarding or training new members. Democratic decision-making is valued but can slow operations, particularly during periods of growth or conflict.

Governance structures sometimes require adaptation. One environmental co-op revised its voting threshold after a conflict with a founding member, demonstrating how internal resilience evolves through learning.

“We changed our governance model to allow for a super majority… so there’s no tyranny of the minority.” (ENV)

6.3.2 Structural Barriers

Co-ops reported that accessing capital and unsupportive regulatory frameworks are central challenges. They are often ineligible for funding mechanisms that privilege conventional corporate forms, and hindered by slow public agency processes that do not align with cooperative values.

“Securing funding is difficult… every application wants one member to assume responsibility.” (TECH)

“The bureaucracy can drag projects on and on… the department employees are at times not responsive to our questions.” (ENV)

Legal structures that prohibit shared ownership or require individual liability also create friction in grant applications or government procurement opportunities. Tech co-ops especially noted systemic biases toward extractive, growth-first models.

”Tech has been funded by venture capital ‘lottery tickets’—investments designed to fail, with a few massive successes. Co-ops, which aim for financial stability, don’t fit this model. We've had to rethink our pricing and operations from the ground up.” (TECH)

6.3.3 Contributions and Barriers to Climate Solutions

Environmental co-ops integrate climate mitigation and adaptation into hands-on landscape work, often pioneering water-wise, regenerative design strategies. Tech co-ops support climate justice through tools, data infrastructure, and platforms for social movements.

“We are focused on capturing carbon in the soil… and enhancing soil biology through rainwater harvesting, nature-based stormwater management, greywater systems.” (ENV)

“We build digital and social infrastructure that can scale regionally and globally… to respond to the scale of the climate crisis.” (TECH)

Yet both sectors still face barriers to scaling this impact. Barriers include limited project capacity, lack of client education, and difficulty sustaining systems-level work under constrained budgets.

“We don’t have a lot of time dedicated to educating clients about climate-related solutions… although we try.” (ENV)

“Budgets or funding for the hard transition conversations… no one wants to pay for this work.” (TECH)

6.3.4 Cooperative Networks and Support Systems

Interviewees frequently highlighted the value of peer networks, regional cooperatives, and educational partnerships. However, these support ecosystems were also described as fragmented or under-resourced, limiting broader impact.

“We regularly partner with land-based orgs… but it’s hard to justify outreach when we’re so backed up in getting to projects.” (ENV)

“We’ve had a lot of great calls connecting with other co-ops but it’s all just been relationship building.” (TECH)

Both sectors expressed interest in federated models, shared infrastructure, and cooperative cross-training, though coordination requires intentional design.

“The idea of a Mondragon-style co-op of co-ops seems like the right balance between individual agency and collective power.” (TECH)

6.3.5 Overcoming Barriers and Strategies for Scaling

Rather than scaling through individual growth alone, many cooperatives embrace distributed approaches—building collaborative infrastructure, shared platforms, and temporary partnerships. Environmental co-ops invest in internal systems and culture, while tech co-ops prioritize movement-aligned tools and federated ecosystems.

“We are continually improving our day-to-day operations through better communication, project tracking, transparency, collaborative software.” (ENV)

“Mapped is our attempt… at building shared infrastructure… with dynamic, actionable visualisations of membership data.” (TECH)

Several tech co-ops also developed trade agreements or piloted co-delivery models to expand their capacity while avoiding unsustainable growth.

“We are piloting a program internally where every large job… involves partnering with another tech co-op.” (TECH)

6.3.6 Future Outlook

Looking ahead, cooperatives see promise in aligned public investment, inter-cooperative collaboration, and broader cultural recognition of cooperative business models. They emphasize the need for systemic support—not just isolated funding or capacity building.

“Multi-sector funding to restore degraded landscapes at every scale… urban tree canopies, green infrastructure, etc.” (ENV)

“We need to be communicating, cooperating, learning together, sharing resources and supporting each other.” (TECH)

Several called for a shift in societal narratives—away from extractive growth and toward ecological, democratic alternatives.

“If the greater culture could understand and recognize cooperatives as a valid business model… that’s a long-term vision.” (ENV)

“New imaginaries of the future… more work spent preparing for transformation rather than propping up existing systems.” (TECH)

6.4 Case Study Highlights

This section highlights two of the eight case studies, one from each sector, conducted for this MP. The case studies provide contextual depth to survey and interview findings. The insights are organized around the three primary research questions — highlighting the cooperatives’ shared and sector-specific barriers to scaling, as well as adaptive strategies.

6.4.1 Environmental Cooperative: Regenerative Design Group

Case Study Interview with Genevieve Lawlor, Worker-Owner

(Participant provided consent for the use of both direct and indirect identifiers on the IRB-approved Informed Consent Form.)

Background and Cooperative Transition

Regenerative Design Group (RDG) is a worker cooperative dedicated to sustainable land use planning, ecological site design, and regenerative agriculture. Founded in 2009 as an LLC by a team of designers committed to sustainability, RDG embedded cooperative values early on, including democratic decision-making, profit sharing, and financial transparency. In 2021, the group formalized its transition into a worker-owned cooperative, solidifying its commitment to shared governance and climate resilience.

“The values have always been there,” explained worker-owner Genevieve Lawlor, “but in 2020 we finally had the team and the capacity to make the transition a reality.” As part of the shift, RDG adopted a formal governance structure, with all worker-owners now serving on the board. “It’s a lot of switching hats,” Lawlor added, “depending on whether we’re talking about governance or day-to-day operations.”

Operations and Key Services

RDG operates within three primary areas:

1. Ecological Site Design – Developing sustainable, biodiverse landscapes that integrate climate resilience principles.

2. Regenerative Agriculture Planning – Working with farmers and farm organizations to design landscapes that enhance soil health and productivity.

3. Climate Resilience Planning – Assisting municipalities and government agencies with land use planning that prioritizes adaptation and sustainability.

Their projects range from campus-wide ecological planning to urban agriculture initiatives that support community farms and food security. Over time, they have expanded their impact by working with larger institutional and government clients while maintaining their grassroots approach to sustainability.

Challenges and Adaptations

RDG, like many worker cooperatives, faces operational and structural challenges that influence its ability to scale while maintaining its core mission. One of the most significant barriers has been navigating outdated land-use policies and slow governmental responses.

...the cultural inability to think beyond political boundaries, general myopia (especially around time),” Lawlor shared. “Regulatory challenges are inherent in our field—sometimes they’re beneficial when enacted responsibly, but other times they hinder innovation.”

Additionally, RDG values maintaining a small, nimble team that prioritizes work-life balance. While scaling might increase their capacity for larger projects, they are cautious about growing in ways that could compromise their studio culture. “We don’t necessarily want to scale—we want to stay nimble and responsive as a studio,” Lawlor emphasized.

Their approach to governance has also required adaptation. Transitioning to a worker cooperative meant establishing new decision-making structures, which they navigated with the support of cooperative networks such as the Cooperative Development Institute and the U.S. Federation of Worker Cooperatives. They also developed a decision-making matrix inspired by another cooperative, Real Pickles, which helped clarify which decisions required board approval versus those that could be made at the management level.

Climate and Social Impact

RDG’s work directly contributes to climate resilience by influencing land management practices at multiple scales. Through their partnerships with organizations such as NOFA-Mass, The Trustees, and the American Farmland Trust, they have amplified their impact in promoting sustainable agriculture and urban greening efforts.

Looking ahead, Lawlor sees an opportunity for worker cooperatives to play a larger role in climate adaptation efforts. “Multi-sector funding to restore degraded landscapes at every scale,” she stated. “Programs that train and employ people in landscape architecture, landscape restoration, climate resilient farming and forestry, expansion and care of urban tree canopies, green infrastructure, etc.”

Lessons and Future Directions

RDG's experience provides valuable insights for other worker-owned enterprises in the environmental sector:

- Intentional Growth Matters – Rather than pursuing growth for its own sake, RDG demonstrates the value of staying mission-focused and scaling impact through partnerships rather than sheer size.
- Navigating Governance is a Learning Process – The transition to a cooperative structure required new governance mechanisms, and having a strong support network was crucial in making that transition smooth.
- Worker Cooperatives Can Shape Policy – While outdated land-use policies pose challenges, RDG's work with municipalities demonstrates how worker cooperatives can influence systemic change.

As RDG continues to refine its cooperative structure and expand its environmental impact, it remains a compelling example of how worker-owned enterprises can advance equitable climate solutions while prioritizing democratic governance and sustainability.

6.4.2 Technology Cooperative: Common Knowledge

Case Study Interview with Gemma Copeland, Worker-Owner

(Participant provided consent for the use of both direct and indirect identifiers on the IRB-approved Informed Consent Form.)

Background and Cooperative Development

Common Knowledge is a worker-owned cooperative founded in 2018 to challenge the dominance of corporate interests in the technology sector. Bringing together technologists, designers, researchers, and facilitators, the cooperative supports grassroots movements through ethical innovation, democratic governance, and mission-driven digital strategy. Its work spans digital product design, strategic training, and infrastructure development to help political, social, and environmental justice movements scale their impact.

The cooperative emerged from a period of heightened political mobilization, grounded in the belief that transformative change requires more than top-down electoral wins—it demands sustained, bottom-up organizing. "We can't just simply win from the top down," noted co-founder Gemma Copeland. "You need the kind of bottom-up movement."

Initially formed through an open call for progressive technologists, Common Knowledge evolved from a tech-for-activism concept into a full-spectrum support hub for movement-building. Its structure has since been refined to balance immediate technical assistance with the long-term goal of strengthening collaborative infrastructure across aligned organizations.

Operations and Key Services

Common Knowledge operates through three primary work areas:

1. Digital Products & Infrastructure: Developing open-source tools, websites, and movement infrastructure to support activism, including mapping and database solutions that enhance campaign effectiveness.

2. Training & Strategic Support: Offering tailored training sessions for organizations on digital organizing, data management, and movement-building strategies.

3. Collaborative Resource Sharing: Facilitating connections between aligned organizations, enabling the pooling of resources, best practices, and technological solutions.

One of their flagship projects, Mapped, was developed in response to the repeated need for digital infrastructure that could visualize and integrate diverse movement data. Instead of developing custom solutions for each organization, the cooperative created a shared tool, allowing grassroots groups to manage membership data, overlay demographic and political information, and improve campaign targeting.

“Mapped is our attempt at addressing these requests in a more widespread and long-term way through building shared infrastructure," Copeland explained. "It integrates with many different CRMs, augments them with datasets, and provides dynamic, actionable visualizations of membership data.”

Challenges and Adaptations

Like many cooperatives, Common Knowledge has faced significant barriers to scaling, particularly in accessing sustainable funding. Operating as a not-for-profit, the cooperative often struggles to secure core funding and must balance its work between mission-driven projects and revenue-generating consultancy. Additionally, onboarding new members poses a challenge, as cooperative governance requires a skillset that blends technical expertise with collective decision-making.

To address these hurdles, the cooperative has implemented several internal strategies:

- Member Learning & Development: Each worker dedicates three hours per week to self-directed study, ensuring they stay up to date with technological advancements and cooperative governance best practices.
- Network Building: Common Knowledge actively participates in networks such as worker-led federations and cooperative alliances to share knowledge, pass work to one another, and receive peer support.
- Sociocratic Governance: Decision-making follows a structured process emphasizing consent rather than full consensus, allowing for efficient, inclusive discussions that accommodate diverse perspectives without creating bottlenecks.

“We use sociocracy to make decisions, which allows for a really good balance of making sure everyone has a voice, but also moving through decisions quite quickly and not stalling trying to find consensus," Copeland explained. "It's a way of integrating all these different voices but still moving forward."

Climate and Social Impact

While Common Knowledge incorporates sustainability practices into its operations—such as green hosting for digital projects and minimizing travel emissions—their broader impact lies in empowering climate movements through technological support. Rather than focusing solely on individual carbon footprint reduction, they emphasize systemic change by equipping climate justice organizations with the tools they need to mobilize effectively.

“We believe that enabling a movement ecological approach through common infrastructure is our best chance at responding to the scale of the climate crisis. This approach unlocks economies of scale that simply aren’t available in bespoke software projects,” Copeland stated.

Their cooperative model also challenges the extractive norms of the tech industry. By refusing to scale in a traditional hierarchical manner, they demonstrate a sustainable alternative: rather than growing into a large firm, they strengthen the cooperative ecosystem through partnerships and knowledge-sharing with allied organizations.

Lessons and Future Directions

Common Knowledge's journey offers several insights for worker-owned technology ventures:

- Scaling Impact Over Size: Growth does not necessarily mean increasing membership but rather expanding influence through shared infrastructure, strategic collaborations, and capacity-building initiatives.
- Sustainable Funding Models: Blending consultancy work with mission-aligned grants can provide financial stability while staying true to cooperative values.
- Democratic Decision-Making as a Strength: While cooperative governance requires time and effort, it fosters a resilient, mission-driven culture that ensures long-term sustainability.

As they look ahead, the cooperative envisions a future where decentralized, interconnected nodes of worker cooperatives collaborate across geographies to build resilient, community-driven digital ecosystems. Their model exemplifies how worker-led technology initiatives can thrive, demonstrating that another way of building and sustaining technology—one rooted in equity, collaboration, and justice—is not only possible but necessary.

As Copeland reflected, "Given the urgency of the crises we face, the natural response is urgency as well. But short-term thinking is what got us into this mess in the first place. The secret to success is deep, slow, and intentional work."

7. Discussion

This section presents findings in three parts. First, it summarizes the mixed-methods results aligned with the study's three research questions, drawing from data collected through structured survey and interview instruments—each shaped by predefined questions. Second, it offers a thematic analysis based on patterns emerging directly from participant responses, independent of the questions asked, to minimize researcher bias and center user experience (Braun & Clarke, 2021). Finally, it compares worker cooperatives with conventional businesses, interpreting their relative advantages and limitations through the lens of cooperative governance, sustainable enterprise, and alternative economies.

7.1 Summary of Mixed-Methods Results

The study's mixed-methods analysis identified shared and sector-specific themes across environmental and technology worker cooperatives. Environmental cooperatives emphasized

regenerative land use and peer-based climate resilience strategies, while technology cooperatives focused on supporting aligned movements through digital infrastructure. Both sectors highlighted the importance of democratic governance and mission alignment. Findings revealed that environmental cooperatives tended to be stable but experienced burnout and labor shortages, whereas technology cooperatives were younger, more experimental, and faced resource limitations. Common operational challenges included inefficiencies, limited staffing, and barriers to growth. Structural constraints—such as inadequate funding, regulatory misalignment, and market exclusion—consistently hindered scalability and climate impact. Despite strong mission alignment, cooperatives across both sectors lacked the resources to achieve broader environmental outcomes. Participants emphasized the need for integrated, cooperative-specific support ecosystems, including access to capital, partnerships, adaptive infrastructure, and tailored governance models (Table 2).

Table 2

Summary of Key Findings

Category	Environmental Worker Cooperative	Technology Worker Cooperative	Common Themes Across Sectors
General Cooperative Info	Regenerative land use, climate resilience, peer training	Support aligned movements via digital tools, peer collaboration, shared infrastructure	Democratic governance aligns mission, climate, community
Cooperative Characteristics	Stable, small-to-mid sized; burnout & sustainability issues	Younger, growing, experimental, less maturity.	Small teams, limited resources; varied growth stages
Operational Challenges	Labor shortages, burnout, internal inefficiencies	Market pressures, client acquisition, inefficiencies	Scaling hindered by staff, funding, governance limits

Category	Environmental Worker Cooperative	Technology Worker Cooperative	Common Themes Across Sectors
Structural Barriers	Funding, regulation, market capacity	VC norms, limited funding & infrastructure	Misalignment with economic & regulatory systems
Barriers to Climate Impact	Mission-aligned, but limited by growth and resources	Limited impact due to contracts & systemic barriers	Value-aligned but resource-constrained for scale
External Support Systems	Need funding, training, partnerships, regulation	Seek partnerships, adaptive infrastructure, capital	Need co-op specific, integrated support ecosystems
Governance Challenges	Mostly functional; leadership & culture issues	Scaling, decision-making, cultural cohesion challenges	Governance = strength & challenge; needs adaptation

7.2 Thematic Analysis

This section presents thematic findings from the mixed-methods analysis, integrating insights from surveys, interviews, and case studies. Patterns reflect core tensions between cooperative values and dominant economic systems. Themes are substantiated through literature and framed to inform future cooperative support structures and policy reform.

7.2.1 Values Before Scale

Worker cooperatives consistently prioritized mission over market. Participants emphasized ecological stewardship, democratic governance, and social justice, even when these commitments constrained growth. Environmental co-ops centered regenerative practices and land-based accountability, while tech co-ops elevated open-source tools and participatory infrastructure. Rather than scaling for size, these co-ops defined success in terms of alignment, resilience, and depth—echoing non-extractive, place-based models of change (Raworth, 2017; Gibson-Graham & Dombroski, 2020).

7.2.2 Misaligned Systems

Cooperatives operate within systems that assume extractive, high-growth business models, which create structural barriers to scaling. Participants described being excluded from capital markets, procurement processes, and regulatory frameworks because of their democratic structures and slower growth timelines. This systemic mismatch represents a form of market failure that requires mission-aligned capital and enabling policy reform (Hess, 2009; Scholz, 2016).

7.2.3 Burnout and Bandwidth

Both tech and environmental co-ops described chronic burnout due to overlapping roles and under-resourced operations. Members often juggled technical, administrative, and care work, leading to fatigue and governance challenges. These findings echo literature emphasizing the importance of well-defined roles and the recognition of emotional labor in sustaining cooperative models (Cheney et al., 2014; Ridley-Duff & Bull, 2019).

7.2.4 Governance as a Double-Edged Sword

Democratic governance emerged as both a strength and a strain. While inclusivity fosters accountability and shared ownership, participants cited decision fatigue, slow onboarding, and governance gridlock. Adaptive frameworks such as sociocracy or role-based delegation may improve efficiency without compromising values (Birchall & Ketilson, 2009; Sociocracy For All, n.d.).

7.2.5 Federation and Ecological Scaling

Many co-ops are shifting away from centralized firm growth toward federated models, drawing inspiration from ecological systems such as mycorrhizal networks, murmuration, and mutual aid. This distributed approach prioritizes replication, solidarity, and resilience over extractive expansion (Bollier & Helfrich, 2012; Capra & Luisi, 2014). Nature serves not just as metaphor but as a functional blueprint for scaling democratic enterprises.

7.2.6 Need for Cooperative-Specific Ecosystems

Participants voiced dissatisfaction with generic startup resources and emphasized the need for cooperative-specific infrastructure—particularly legal support, backend systems, and procurement readiness. Effective ecosystems must be tailored to cooperative contexts and grounded in the lived experiences of worker-owners (Wright, 2010; Tanner, 2013; Pérotin, 2016).

7.2.7 Complexity of Dual Missions

Environmental and tech cooperatives balance technical excellence with social purpose. Participants described the difficulty of balancing these objectives, especially when onboarding new members. As one tech co-op member explained, “Onboarding people requires them to both settle into their specialist role as well as learn how to run the co-op—skillsets that are often entirely new.” This dual expectation reflects the hybrid nature of cooperative work, where professional and governance responsibilities are deeply intertwined. Successfully managing these dual missions requires sustained investment in cooperative education, leadership development, and business models that reinforce both dimensions of the work (Satgar, 2014).

7.2.8 Capital Constraints in a Profit-Driven System

A recurring theme was structural capital access constraints. Cooperatives, particularly those engaged in climate-related work, often lack eligibility for conventional financing due to their longer return timelines and distributed ownership structures. As one participant noted, “There’s no funding structure that really fits us.” These limitations highlight the need for non-extractive finance models, risk-tolerant, impact-first capital that attract additional investment, and public investment mechanisms designed to support mission-driven enterprises (Brown, Kadam, & Klein, 2023). Without financial structures aligned with cooperative principles, climate-focused co-ops will remain systematically excluded from mainstream funding opportunities despite their high social and environmental value.

7.2.9 Summary of Thematic Analysis

This analysis underscores a fundamental tension between cooperative values and dominant economic systems. Environmental co-ops face regulatory delays, labor-intensive operations, and capital access constraints, compounded by policy environments misaligned with democratic ownership models (Hess, 2009; Gibson-Graham et al., 2013). Tech cooperatives are often excluded from venture capital ecosystems that prioritize rapid growth and founder-led governance, rendering many co-ops structurally incompatible with prevailing startup norms (Scholz, 2016; Mannan, 2021).

Despite these barriers, cooperatives in both sectors are developing innovative, values-aligned strategies for growth. Environmental co-ops emphasize place-based partnerships and policy advocacy, while tech co-ops are adopting federated, open-source models that enable distributed scaling without compromising democratic governance (Bollier & Helfrich, 2012; Raworth, 2017). Cooperative ownership offers distinct advantages—such as high job satisfaction, resilience, and

stakeholder accountability—yet also presents trade-offs, including slower decision-making and limited administrative capacity (Birchall & Ketilson, 2009; Cheney et al., 2014; Pérotin, 2016; Ridley-Duff & Bull, 2019).

Ultimately, scaling is not merely a technical challenge but a cultural and political one. Addressing it requires building robust cooperative ecosystems that include peer networks, enabling policy frameworks, and non-extractive finance mechanisms that align with cooperative principles and support just, sustainable outcomes (Satgar, 2014; Gibson-Graham & Dombroski, 2020).

7.3 Worker Cooperative vs. Conventional Business Models: A Sectoral Comparison

The following tables present a comparative analysis of worker cooperatives and traditional business models in the environmental (Table 3) and technology (Table 4) sectors. Derived from interview data and case studies, these tables synthesize key advantages and disadvantages across multiple operational dimensions, including capital access, scalability, governance, labor models, market positioning, and policy navigation. The comparisons illuminate how the cooperative model differs from conventional structures in terms of values alignment, growth strategies, and long-term sustainability, offering insights into the trade-offs each model faces as they pursue environmental and social impact.

Table 3

Environmental Sector Comparison: Advantages and Limitations

Category	Environmental Worker Co-ops	Traditional Environmental Businesses
Capital Access	Pro: Mission-aligned grants and community funding Con: Limited access to large-scale investment	Pro: Easier access to capital markets and ESG investors Con: May prioritize profits over ecological outcomes

Category	Environmental Worker Co-ops	Traditional Environmental Businesses
Scalability	Pro: Scales sustainably, community-first Con: Slower growth due to regulatory and financial constraints	Pro: Can scale rapidly with investment Con: Risk of over-expansion or greenwashing
Governance	Pro: Democratic control ensures worker input and accountability Con: Slower decision-making processes	Pro: Quick, top-down decisions Con: Limited worker voice or transparency
Labor Model	Pro: Deep alignment with regenerative values Con: Physically demanding work with modest pay	Pro: Higher efficiency and pay Con: May overlook ecological training or values
Retention	Pro: Strong mission commitment Con: Difficult to retain skilled labor due to pay gaps	Pro: Attract and retain talent with compensation Con: Weaker alignment with ecological values
Market Positioning	Pro: Trusted by communities; offers regenerative services Con: Niche market, low visibility	Pro: Compete on cost and speed Con: Can overshadow co-ops through scale, not quality
Policy Navigation	Pro: Policy-aligned missions Con: Slowed by complex permitting and lack of co-op-specific policies	Pro: Better equipped to navigate regulation

Category	Environmental Worker Co-ops	Traditional Environmental Businesses
		Con: May influence policy to favor profit
Growth Strategy	Pro: Builds long-term, place-based partnerships Con: Limited geographic expansion	Pro: National or global expansion possible Con: Risk of disconnection from local context
Geographic Reach	Pro: Locally rooted, ecosystem-based focus Con: Growth constrained by geography	Pro: Operate across regions or states Con: Less sensitive to local ecological needs

Table 4

Technology Sector Comparison: Advantages and Limitations

Category	Tech Worker Co-ops	Traditional Tech Firms
Capital Access	Pro: Independence from investor pressures Con: Limited access to VC or high-growth funding	Pro: Access to VC and scale capital Con: Prioritize investor returns over worker well-being
Scalability	Pro: Values-based growth; avoids hypergrowth risks	Pro: Rapid scaling possible

Category	Tech Worker Co-ops	Traditional Tech Firms
	Con: Slower to scale	Con: Burnout and mission drift common
Governance	Pro: Worker ownership and democratic control	Pro: Fast decisions, centralized strategy
	Con: Risk of slow decision-making or gridlock	Con: Minimal worker input or transparency
Workforce Retention	Pro: High job satisfaction through ownership	Pro: Competitive compensation packages
	Con: Lower salaries may drive attrition	Con: High turnover and burnout rates
Market Competition	Pro: Ethical, transparent practices	Pro: Strong branding and innovation speed
	Con: Low visibility; hard to compete with VC-backed giants	Con: Often sacrifice ethics for growth
Customer Base	Pro: Trusted by mission-aligned clients	Pro: Broad appeal and market penetration
	Con: Smaller market due to limited awareness	Con: Customer loyalty can be transactional
Legal & Policy Fit	Pro: Model promotes inclusive innovation	Pro: Startup-friendly legal and funding environment
	Con: Poor fit with current tech policy/funding structures	Con: Reinforces concentration of power

Category	Tech Worker Co-ops	Traditional Tech Firms
Growth Strategy	Pro: Emphasizes federated, networked models Con: Requires high coordination effort	Pro: Scales through aggressive acquisition and market share Con: May centralize wealth and decision-making
Geographic Reach	Pro: Operate globally through remote teams Con: Harder to maintain governance cohesion at scale	Pro: Scalable to global operations Con: May dilute workplace democracy and culture

8. Recommendations

This section outlines actionable strategies to support the growth and impact of worker cooperatives in the environmental and technology sectors. Recommendations are categorized into (1) shared strategies across sectors and (2) sector-specific recommendations. These are based on empirical findings from the research and supported by relevant literature on cooperative development, sustainability transitions, and democratic enterprise systems.

8.1 Shared Recommendations Across Sectors

Worker cooperatives in both environmental and tech sectors face systemic constraints—namely access to capital, scalability limitations, and lack of policy recognition. Several shared strategies are recommended:

- **Expand Cooperative Access to Capital and Innovation Funding**
  Cooperatives are often excluded from traditional startup financing mechanisms, particularly those reliant on venture capital. Establishing cooperative-specific loan funds, revenue-based financing, or green bonds can address this disparity (Restakis, 2010; Scholz, 2016).
- **Enhance Cooperative Visibility and Public Education**
  A pervasive lack of awareness about the cooperative model contributes to market disadvantages. Coordinated marketing campaigns, national directories, and storytelling

initiatives can raise visibility and legitimacy among consumers and funders (Birchall & Ketilson, 2009; Pérotin, 2016).

- **Invest in Democratic Governance and Operational Capacity**
  Technical assistance for shared leadership, facilitation, and administrative systems is critical to prevent decision fatigue and burnout within lean cooperative teams (Cheney et al., 2014; Ridley-Duff & Bull, 2019).
- **Support Lifespan Development and Sector-Specific Needs**
  Cooperative support organizations should not only assist with formation but also provide ongoing guidance tailored to sector-specific challenges. Lifelong support—especially during phases of scaling—can help cooperatives maintain democratic integrity while adapting to complex operational needs. Support should be differentiated to reflect the unique labor structures, revenue models, and regulatory landscapes of each sector.
- **Integrate Climate and Environmental Education Across All Work**
  Support organizations and cooperative networks should embed environmental literacy into training and strategic guidance. Every cooperative—regardless of sector—should be equipped to see their work as contributing to climate resilience and ecological well-being. Framing all work as climate work can strengthen mission alignment and broaden participation in climate solutions.
- **Develop Shared Digital Infrastructure and Federated Growth Platforms**
  Especially in the tech sector, federated models and shared back-end tools enable growth while maintaining cooperative values. Open-source collaboration and platform cooperativism offer scalable, democratic alternatives to centralized models (Bollier & Helfrich, 2012; Scholz & Schneider, 2016; Mannan, 2021).
- **Leverage Biomimicry to Inform Cross-Sector Cooperative Design**
  Cooperative ecosystems can draw inspiration from biological systems such as murmuration, myxobacteria swarms, or mycorrhizal networks to design scalable, decentralized infrastructure (Koch & White, 1999). Technology cooperatives are uniquely positioned to develop digital tools and platforms that emulate these systems—facilitating peer-to-peer signaling, adaptive coordination, and resource sharing. These technologies can help environmental cooperatives amplify their impact by improving visibility, knowledge exchange, and operational efficiency. At the same time, they offer ethical and democratic alternatives to extractive, centralized tech platforms. Embedding biomimicry in cooperative design reinforces values-aligned growth and strengthens the

interdependence between environmental and tech sectors (Benyus, 2002; Kanwal & Awan, 2021).

8.2 Sector-Specific Recommendations

8.2.1 Environmental Worker Cooperatives

Environmental co-ops face local regulatory hurdles, labor challenges, and funding dependencies. Tailored interventions include (Table 5):

- **Streamline Permitting and Cooperative Procurement Policies**
  Environmental co-ops often experience project delays due to permitting and compliance processes. Municipalities should adopt co-op-inclusive procurement policies and establish fast-track permitting for ecological services (Gibson-Graham et al., 2013).
- **Support Regional Hubs and Place-Based Networks**
  Co-ops benefit from ecological and geographic clustering. Regional hubs offering pooled services, shared staffing, and policy advocacy can enhance stability and reduce duplicative efforts (Rowe et al., 2018; Duda, 2019).
- **Develop Green Job Pipelines for Regenerative Sectors**
  Labor shortages can be addressed through partnerships with educational institutions to develop regenerative workforce training, offering living wages and career pathways within environmental co-ops (Birney et al., 2021; Spaulding et al., 2024).

Table 5

Recommendations for Environmental Worker Cooperatives

Category	Recommendations for Environmental Co-ops
Capital Access	Expand co-op eligibility for green bonds and ESG-aligned public financing
Scalability	Streamline permitting for co-ops; provide technical assistance for scaling models

Category	Recommendations for Environmental Co-ops
Governance	Support training in cooperative governance; fund shared admin and facilitation roles
Labor Model	Invest in workforce development for green jobs in co-ops
Retention	Offer living wage incentives and benefits for workers in community-based co-ops
Market Position	Create co-op certification and public education campaigns on cooperative benefits
Policy Barriers	Adopt cooperative-friendly procurement and permitting policy reforms
Growth Strategy	Fund regional federations or hubs for environmental co-ops
Geographic Reach	Promote inter-cooperative partnerships to increase regional visibility and contracts

8.2.2 Tech Worker Cooperatives

Tech co-ops must navigate fast-moving digital markets, limited cooperative awareness, and exclusion from startup ecosystems. Recommendations include (Table 6):

- **Create Cooperative Innovation Funds and Incubators**
  Public and philanthropic actors should seed co-op innovation funds and incubators to offer alternative financing and technical assistance for startup tech co-ops (Scholz, 2016; Mannan, 2021).
- **Reform Legal and Policy Frameworks for Digital Co-ops**
  Many tech co-ops operate in regulatory grey areas. State and local governments should

streamline cooperative registration, create multi-stakeholder co-op legal forms, and extend startup incentives to cooperatives (Wright, 2010; Satgar, 2014).

- **Support Federated Platforms and SaaS Co-ops**
  Tech co-ops scale best through shared digital infrastructure. Investment in federated SaaS platforms, interoperable tools, and open-source ecosystems will enable cooperative scalability while preserving governance integrity (Bollier & Helfrich, 2012; Scholz, 2016).

Table 6

Recommendations for Technology Worker Cooperatives

Category	Recommendations for Tech Co-ops
Capital Access	Establish cooperative venture funds and public innovation grants for tech co-ops
Scalability	Encourage federated scaling through platform cooperativism
Governance	Develop training cohorts and toolkits for efficient democratic governance
Retention	Introduce cooperative compensation models with flexible equity-sharing mechanisms
Market Competition	Build brand recognition for tech co-ops via coalition marketing and shared platforms
Customer Base	Create public directories, success stories, and digital platforms for co-op services
Legal Barriers	Advocate for legal reforms that recognize cooperative tech models

Category	Recommendations for Tech Co-ops
Growth Strategy	Support digital infrastructure and shared services for tech co-op networks
Geographic Reach	Develop governance protocols for distributed co-ops; fund cooperative SaaS tools

8.3 Leveraging Housing and Financial Cooperatives as Anchors

We must build strong anchors—starting with financial and housing cooperatives—to support, stabilize, and fuel the growth of the broader ecosystem (Tanner, 2013).

A recurring theme across interviews and survey responses was the challenge of financial precarity—both at the enterprise and individual member levels. Worker cooperatives in the environmental and technology sectors frequently cited access to capital as a primary barrier to scaling, as well as a factor limiting operational flexibility and resilience. This is consistent with existing literature that underscores the misalignment between cooperative financing needs and prevailing venture capital or grant-based funding systems (Restakis, 2010; Scholz, 2016).

In parallel, cost-of-living pressures—particularly in urban areas—emerged as a driver of workforce instability. Several cooperatives reported difficulty retaining members who were forced to relocate or seek higher-paying employment due to unaffordable housing, inadequate benefits, or the inability to build personal wealth while working in mission-driven but lower-wage sectors. This finding is especially pronounced among environmental worker cooperatives, which tend to operate in place-based contexts but face retention challenges due to the physical demands of the work and the relatively low compensation it commands.

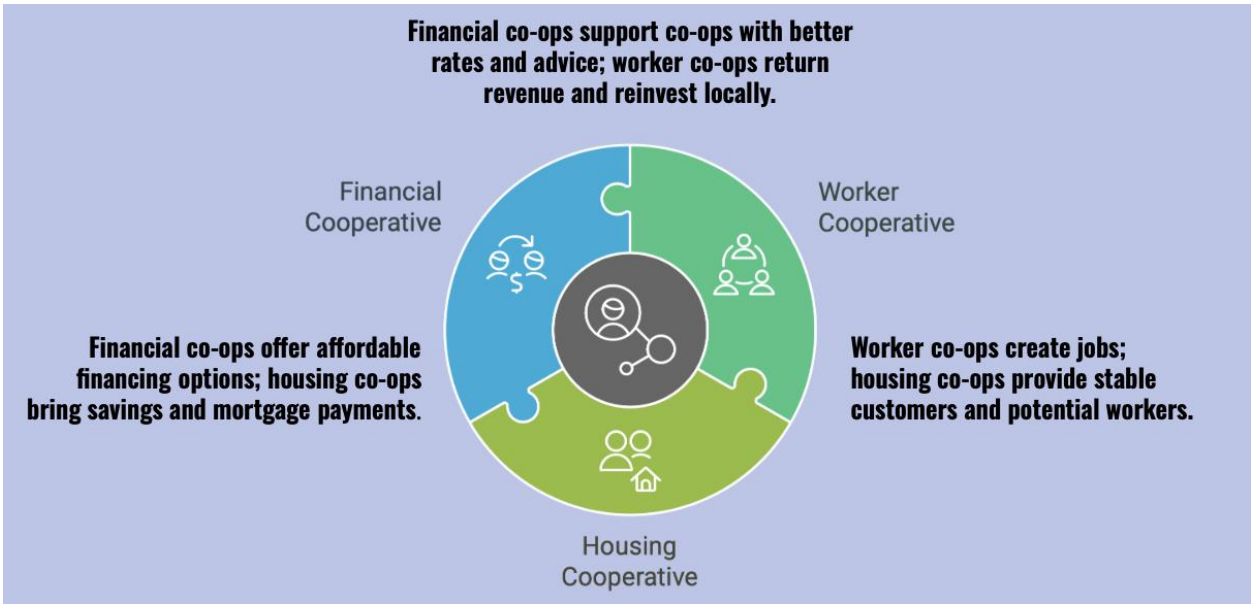
Given these dual constraints, housing and financial cooperatives represent a critical yet underutilized opportunity for cross-sector anchoring. Housing cooperatives can provide long-term affordability, residential stability, and collective ownership—helping to mitigate displacement pressures that often disrupt the cohesion of worker cooperative teams. In addition to offering secure housing for cooperative members, they can serve as safe, inclusive spaces for vulnerable populations, including elders, people with disabilities, and youth. Moreover,

housing co-ops offer a platform to model sustainable development practices such as renewable energy use, waste reduction, and local food production (Meier, 2016; Arigoni, 2023; Fakharany, 2023; Winstead, 2023). Similarly, credit unions and financial cooperatives can deliver mission-aligned lending, tailored technical assistance, and financial services that reflect the governance structures and cash flow dynamics of worker co-ops. These institutions are uniquely positioned to invest in infrastructure aligned with the Sustainable Development Goals (SDGs), promote financial inclusion, and channel resources into community-based, regenerative economies—ultimately supporting both the financial and environmental wellbeing of their members (McKinsey, 2012; Ellen MacArthur Foundation, 2013; Hemphill, 2018). Together, housing and financial cooperatives could function as stabilizing infrastructure across the cooperative ecosystem—reducing turnover, enabling wealth-building, and enhancing long-term organizational resilience.

This insight aligns with emerging research on the solidarity economy, which advocates for integrated ecosystems of mutual aid, democratic ownership, and shared infrastructure across sectors (Satgar, 2014; Gibson-Graham & Dombroski, 2020). Future strategies to scale worker cooperatives should prioritize inter-cooperative collaboration that enables resource pooling and collective resilience. Bridging worker, housing, and financial co-ops could help reframe growth not as isolated business expansion but as the strengthening of cooperative ecosystems rooted in economic democracy and long-term viability (Figure 13).

Figure 13

Anchoring Ecosystems



Note. This diagram shows how financial and housing cooperatives can be leveraged as anchors.

8.4 Identifying Strategic Allies for Cooperative Ecosystem Development

Effective implementation of the recommendations outlined in this MP requires the coordinated involvement of public agencies, private entities, nonprofit intermediaries, and academic institutions. Worker cooperatives do not operate in isolation; their ability to scale equitably and sustainably is influenced by the larger ecosystem in which they are embedded. Drawing on findings from this study, as well as existing research on solidarity economies and cooperative development (Scholz, 2016; Gibson-Graham & Dombroski, 2020), this section identifies the key roles that each sectoral actor can play in advancing cooperative infrastructure, visibility, and resilience.

Public sector actors—such as municipal governments, economic development agencies, and public utilities—are well-positioned to adopt cooperative-friendly procurement policies, offer technical assistance, and reform permitting and funding mechanisms that currently privilege investor-owned firms.

Private sector partners—particularly values-aligned businesses, B Corporations, and financial institutions—can offer market access, investment capital, and procurement opportunities, such as hiring co-ops as subcontractors.

Nonprofit organizations—including cooperative support organizations, labor unions, and community development financial institutions (CDFIs)—can provide training, advocacy, and shared services infrastructure.

Finally, academic institutions can contribute research, evaluation, incubator programs, and workforce pipelines that legitimize and support cooperative models.

The following table summarizes these roles, aligned with the major recommendations of this MP (Table 7).

Table 7

Public, Private, Nonprofit, and Academic Roles

Recommendation	Public Sector	Private Sector	Nonprofit Sector	Academic Sector
Expand access to capital and funding	Create co-op loan funds, green bonds, public grants	Provide cooperative-aligned investment (e.g., credit unions, social lenders)	Facilitate CDFI partnerships; offer grantwriting support	Research financing innovations; evaluate co-op loan performance
Streamline permitting and cooperative procurement	Prioritize co-ops in public contracts; create fast-track pathways	Integrate co-ops in ESG procurement practices	Advocate for policy change; support compliance training	Document outcomes and best practices; recommend policy frameworks

Recommendation	Public Sector	Private Sector	Nonprofit Sector	Academic Sector
Build cooperative workforce and leadership capacity	Fund job training and apprenticeships for cooperative sectors	Offer professional mentorship; sponsor fellowships	Deliver governance, HR, and admin training through support orgs	Develop cooperative curriculum; embed in professional degree pathways
Promote cooperative visibility and market access	Launch public awareness campaigns; endorse co-op certifications	Feature co-ops in ethical supply chains and vendor directories	Run public education campaigns; convene cooperative showcases	Publish case studies; support student-led storytelling and media projects
Support federated and digital infrastructure	Fund shared platforms for tech and environmental co-ops	Contribute open-source tools; share technical expertise	Incubate multi-coop digital tools and federated platforms	Research governance of federated models; evaluate digital co-op scaling strategies
Bridge housing, finance, and worker co-ops	Incentivize integration of housing, financial, and worker co-ops	Offer lease agreements or low-interest loans to co-op-affiliated members	Coordinate shared services across cooperative types	Study cross-sector cooperative ecosystems; identify impact metrics

By engaging these stakeholder groups in intentional and coordinated ways, worker cooperatives can be embedded into broader systems of support—reducing isolation, amplifying collective power, and expanding their role in equitable climate and digital transitions. A robust ecosystem approach to cooperative development aligns with growing scholarship advocating for institutional diversity, distributed ownership, and solidarity-based economic planning (Wright, 2010; Bollier & Helfrich, 2012; Satgar, 2014).

8.5 Biomimicry and the Blueprint of Nature

Nature offers powerful insights into how systems can thrive through cooperation, not despite it. Contrary to common narratives centered solely on competition, ecological systems often succeed by balancing both competition and collaboration. In particular, the collective behaviors of murmuring starlings and myxobacteria offer compelling models for designing stronger cooperative ecosystems (Koch & White, 1999).

A murmuration—a sky filled with thousands of starlings swirling in unison—presents a breathtaking example of decentralized coordination. No single bird is in charge. Instead, each starling follows a simple rule: pay attention to the movements of its seven closest neighbors. This basic form of local sensing allows the flock to act as a cohesive unit, responding instantly to external stressors like predators or shifts in the wind. The result is stunningly synchronized movement that emerges not from hierarchy, but from mutual awareness and distributed responsiveness (Couzin et al., 2005).

Beneath the soil, myxobacteria—single-celled organisms—also exhibit this form of responsive cooperation. In times of scarcity, these bacteria sense environmental stress, communicate chemically, and self-organize into coordinated swarms. Their collective movement allows them to seek new resources and form protective structures, transforming from independent agents into a mobile, adaptive organism (Cao, et al., 2015; Muñoz-Dorado, et al., 2016). This behavior underscores a key insight: cooperation in nature is often triggered by environmental stress and sustained by simple yet effective rules of sensing and signaling.

These biological models suggest that impact does not require hierarchy—it requires shared sensing, communication, and coordinated action. Applied to the cooperative movement, especially among worker cooperatives in the environmental and technology sectors, this biomimetic lens reveals valuable design principles. Tech cooperatives, for instance, can act like the skybound starlings—providing sensing tools, digital infrastructure, and networked responses. Environmental cooperatives, like the grounded myxobacteria, embody place-based

action and regenerative impact. Together, these sectors can move from fragmented efforts to synchronized momentum.

To fully realize this potential, the cooperative ecosystem must be designed with strong, stabilizing anchors. Housing and financial cooperatives serve as these anchors—providing stable shelter, reducing cost-of-living barriers, and offering access to capital, all of which were repeatedly cited by cooperatives in this study as key to member retention and sustainability. When these foundational supports are in place, worker cooperatives can move from isolation to interconnection—forming a resilient, networked ecosystem capable of scaling regenerative impact.

In short, like nature, the cooperative movement can grow: networked, resilient, adaptive, and alive. But it requires deliberate attention to ecosystem conditions, support infrastructures, and patterns of mutual responsiveness.

8.6 Potential Members of Tech and Environmental Worker Cooperatives

While public, private, nonprofit, and academic institutions all have roles to play in supporting the cooperative economy, the real engine of transformation lies with individuals. Worker cooperatives in both the technology and environmental sectors benefit from a diverse and intergenerational base of members who bring unique motivations, skills, and lived experiences.

Young adults are often drawn to cooperatives as a means of aligning work with purpose. Many seek values-driven careers that offer not only employment, but also a sense of belonging and agency. Tech and environmental cooperatives offer entry points for these individuals to contribute to regenerative and socially responsible futures while building meaningful livelihoods.

Mid-career professionals bring valuable technical expertise, networks, and leadership experience. Often seeking greater alignment between their personal values and professional paths, this group is well-positioned to strengthen cooperative governance, expand market reach, and support long-term strategic development.

Older adults—especially those transitioning out of traditional business ownership or seeking legacy-driven impact—represent a critical but often overlooked constituency. Their investments of capital, mentorship, and institutional knowledge can support cooperative succession planning and incubate new enterprises that embed equity and sustainability from the outset.

Collectively, these groups form the human infrastructure needed to build resilient, democratic workplaces. As such, the cooperative model invites not just participation, but stewardship—

offering people across all life stages an opportunity to shape a more equitable economy (Birchall, 2011).

9. Implications, Limitations, and Potential Biases

This study contributes to the growing body of scholarship examining the role of worker cooperatives in advancing economic democracy, climate resilience, and just transitions. While the findings offer valuable insights, they must be interpreted in light of several limitations and potential biases. This section outlines the study's practical implications, methodological constraints, participation limitations, and considerations regarding researcher and sampling bias.

9.1 Implications

The findings have three primary implications for cooperative development, policy design, and impact assessment. First, the study underscores the importance of ecosystem-level strategies to support worker cooperative growth. Rather than focusing exclusively on firm-level expansion, cooperatives emphasized the need for federated structures, peer learning, and supportive infrastructure. This has implications for cooperative development organizations, public-sector funders, and networks seeking to scale through interdependence rather than centralization.

Second, the research highlights the necessity of sector-specific interventions. Environmental cooperatives identified barriers such as permitting complexity and lack of public awareness of their value, while technology cooperatives described structural disadvantages in venture-capital-dominated markets. These findings suggest that policies and technical assistance must be tailored to distinct operational and regulatory landscapes.

Third, the study challenges conventional impact metrics by proposing alternative evaluative frames for scale—namely ecological restoration, community wealth-building, and democratic governance. These insights may inform public procurement, climate investment, and philanthropic frameworks that seek to support cooperative models grounded in long-term value and shared prosperity.

9.2 Methodological Limitations

Several methodological limitations shaped the scope and interpretation of this study. First, the sample size was small: 14 survey responses, 9 interviews, and 2 of 8 case studies highlighted. While this reflects the limited number of worker cooperatives operating in these sectors, it

restricts generalizability. The findings should be considered exploratory and illustrative rather than representative of the entire cooperative landscape.

Second, the classification of cooperatives into “environmental” and “technology” sectors required simplification. Many cooperatives operated across categories or engaged in interdisciplinary work. Categorization was based on primary self-reported activities, which may obscure hybrid models or evolving organizational identities.

Third, the study was conducted over a limited timeframe, which may have captured temporal concerns (e.g., burnout, funding cycles) not reflective of long-term patterns. A longitudinal approach would offer deeper insights into how cooperatives evolve in response to systemic pressures and support interventions.

9.3 Participation Limitations

The study also encountered several participation barriers that may have influenced representation. While the survey response rate was relatively low, the data nonetheless offered valuable insights into cooperative engagement and sectoral differences. Participation limitations included:

- **Unclear relevance:** Some cooperatives—especially in the technology sector—initially did not see the study’s applicability. For instance, one tech worker cooperative expressed interest but noted that climate change was not central to their work, though they engage in digital governance, ethical AI, and secure technologies that contribute indirectly to sustainability. Similarly, another tech co-op initially viewed their work as unrelated but later recognized its connection to digital justice, misinformation, and data ethics—all of which align with sustainability and equity goals.
- **Competing priorities:** Several cooperatives faced urgent deadlines and operational pressures that limited their capacity to participate.
- **Lack of incentives:** A number of respondents indicated that they could not provide pro bono time for academic research. One cooperative forum requested compensation to circulate the survey but still shared it, ultimately contributing three fully engaged participants.
- **Poor timing:** The survey was distributed in the weeks preceding major holidays, which likely reduced response rates due to reduced availability.

- **Survey fatigue and unclear terminology:** Some respondents cited past research efforts, including those by the Democracy at Work Institute, as reasons for non-participation. Others found key terms like “cooperative support” unclear or too broadly defined.

Despite these challenges, tech cooperatives were among the most engaged respondents, indicating possible pathways for future outreach and collaboration. The findings also revealed that worker cooperatives with clear environmental contributions—such as those in land use planning or waste hauling—do not always self-identify as environmental. This suggests the need for more flexible and inclusive sectoral classifications in future cooperative research.

9.4 Potential Biases

The research process was shaped by the positionality of the researcher as both a sustainability practitioner and an advocate for cooperative models. While steps were taken to design a rigorous and reflexive inquiry, including IRB approval and anonymized data collection, interpretive bias toward cooperative potential may remain.

In addition, some survey and interview instruments were developed with assistance from artificial intelligence tools (e.g., ChatGPT). Although all instruments were reviewed and refined for clarity and neutrality, the use of AI-generated prompts introduces the possibility of subtle framing effects or gaps in thematic coverage.

Lastly, the recruitment approach—relying on publicly available directories and cooperative networks such as the US Federation of Worker Cooperatives—likely overrepresents more established or networked cooperatives. New, isolated, or informal cooperatives may be underrepresented, limiting insights into early-stage or marginalized formations.

10. Future Research and Outreach Considerations

This study lays the groundwork for understanding how worker cooperatives in the environmental and technology sectors contribute to regenerative, equitable, and resilient economies. However, the exploratory nature and limited scale of this research suggest several important directions for future inquiry and improved outreach.

10.1 Larger and More Representative Sample

First, future studies would benefit from a larger and more representative sample of cooperatives across diverse geographies, growth stages, and cooperative types. While this study focused on

environmental and technology worker co-ops, additional research could explore co-ops engaged in energy, waste recovery, circular logistics, food systems, and cooperative infrastructure. Including multilingual outreach and informal or emerging co-ops outside established networks would expand the scope and inclusivity of future data.

10.2 Longitudinal Studies

Second, longitudinal studies could track how cooperatives evolve over time—particularly through periods of expansion, governance transition, or shifts in external support. Such research could reveal patterns in member engagement, decision-making, replication, and resilience under different economic or political conditions.

10.3 Cooperative Ecosystems and Cross-Sector Collaboration

Third, there is a need for research focused on cooperative ecosystems and cross-sector collaboration. Respondents emphasized that worker co-ops rarely scale in isolation. Future research could examine how cooperatives interact with housing co-ops, financial institutions, federations, and public entities to form mutually reinforcing systems. Comparative studies could explore shared back-office functions, data platforms, and the role of federated governance in enabling scale without compromising democratic values.

10.4 Cooperative Identity and Framing of Climate Relevance

Fourth, future research should pay closer attention to cooperative identity and the framing of climate relevance, especially for technology cooperatives. Many tech co-ops do not explicitly identify as climate-focused, yet they contribute to sustainability through ethical AI, data governance, misinformation mitigation, and platform cooperativism. Clarifying these links in research framing and outreach will be essential for building inclusive climate-aligned movements.

10.5 Interdisciplinary Research Into Biomimicry

Fifth, additional interdisciplinary research into biomimicry may deepen understanding of cooperative dynamics. Ecological models—such as myxobacteria swarming, murmuration in birds, or mycorrhizal networks—offer both metaphorical and practical guidance for distributed coordination, adaptive scaling, and mutualism (Ilieva, et al., 2022). These models align with the values and structural needs of cooperatives and could inform both strategy and communication.

10.6 Lessons for Future Outreach and Engagement

Finally, this study revealed several lessons for future cooperative outreach and engagement:

- **Clarify the role of tech in climate solutions**: Outreach should explicitly connect digital ethics, platform co-ops, and data justice to sustainability to engage tech cooperatives that may not initially see their relevance.
- **Address carbon footprint assumptions**: Some respondents viewed climate work narrowly in terms of emissions reduction. Outreach should broaden the definition to include indirect and systemic contributions to climate justice.
- **Offer incentives for participation**: Several cooperatives requested compensation or visibility. Offering honoraria, opportunities for research dissemination, or network connections may increase engagement.
- **Optimize survey timing**: Avoiding end-of-year distribution and launching outreach before major holidays could improve response rates and attention.
- **Provide flexible participation options**: Smaller cooperatives with limited capacity benefited from asynchronous interview formats (e.g., written responses), which reduced scheduling barriers and allowed thoughtful engagement. Future outreach should continue offering multiple participation pathways to accommodate different organizational structures and time constraints.

These lessons underscore the importance of designing outreach strategies that are inclusive, sector-sensitive, and responsive to the lived realities of worker cooperatives.

In sum, future research should aim to deepen, diversify, and contextualize the study of worker cooperatives—not just as alternative businesses, but as evolving systems capable of addressing complex challenges at the intersection of equity, climate, and democracy.

11. Conclusion

This study underscores a powerful truth: worker cooperatives—especially in the environmental and technology sectors—are not fringe alternatives. They are essential innovations at the frontlines of climate action, economic justice, and democratic enterprise. Despite facing steep barriers—from constrained capital flows to systemic policy neglect—these cooperatives continue to model what an equitable and regenerative economy can look like.

Rooted in democratic governance, social accountability, and ecological purpose, environmental and tech co-ops refuse to compromise mission for market conformity. Their values-first

approach often slows access to traditional financing and limits their influence in a system engineered for hierarchy and short-term returns. Yet it is precisely this principled resistance to extractive norms that makes them worthy of support and investment.

Thematic findings reveal the deep tensions worker cooperatives navigate daily: burnout from shared workloads, the complexity of consensus governance, and the scarcity of cooperative-ready infrastructure. But in the face of these challenges, co-ops are pioneering adaptive strategies that embody resilience and ingenuity. Environmental cooperatives leverage place-based partnerships to scale community-rooted impact, while tech co-ops are building federated, open-source networks inspired by ecological systems—murmurations, mycorrhizal webs, decentralized intelligence.

These models aren't hypothetical. They're thriving under pressure. As one participant noted, "I wanted to do more meaningful work that aligned with my politics, in collaboration with peers instead of within a hierarchical organization." Others pointed to job security and dignity: "At a co-op… I know I'll always have a job." These statements echo broader evidence. Research consistently shows that co-ops offer higher job satisfaction, flatter pay structures, and greater organizational stability—even through recessions and market shocks (Pérotin, 2016; Bretos & Errasti, 2017).

The comparative data is clear: while traditional firms may outpace cooperatives in speed or capital access, they often sacrifice equity, sustainability, and worker well-being in the process. Cooperatives, by contrast, ground growth in ethics—not exploitation. They scale trust, purpose, and shared prosperity.

At this critical moment—defined by ecological breakdown, deepening inequality, and social dislocation—worker cooperatives are not just relevant; they are vital. They offer a roadmap for the future of work that is democratic, dignified, and resilient. But to scale their impact, we must collectively shift the terrain: fund cooperative finance mechanisms, reform exclusionary policies, and elevate the stories of those who are quietly building the next economy from the ground up.

The urgency is underscored by current events. In April 2025, a U.S. federal court ruled that Google illegally monopolized digital advertising (United States v. Google LLC, 2025), while rising corporate influence over public systems—exemplified by Elon Musk's control of the Department of Government Efficiency—highlights the risks of centralized power (The Economist, 2025; The Guardian, 2025). Concurrently, global temperatures reached record highs, with January 2025 averaging 1.33°C above the 20th-century baseline and historically low

sea ice in subsequent months (NOAA NCEI, 2025a, 2025b, 2025c). These climate extremes illustrate the stakes.

As 2025 unfolds--the United Nations International Year of Cooperatives--there is a critical window to support scalable, values-aligned economic alternatives. Investing in worker cooperatives is not charity—it is strategic. It’s how we build climate solutions that last, technologies that serve people over platforms, and economies rooted in reciprocity instead of extraction. The cooperative model is a grounded, scalable response to our most pressing challenges. The opportunity is now—and the stakes could not be higher.

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13. Appendix A

A.1 Generative AI Use in Instrument Development

Generative AI (ChatGPT) was used as a tool for drafting and refining initial outreach materials, survey instruments, and interview protocols. Prompts were crafted by the author to align with study goals and best practices in social science research. AI-generated drafts were edited, simplified, and validated through pilot testing and IRB review.

A.1.1 Outreach Email Prompts

- "Draft an email to reach out to cooperatives in environmental, tech, and cooperative support sectors to recruit participants. The email is part of an institutional review board requirement. Provide a brief background of the study and what is involved."
- "Create separate emails for each of the sectors."
- "Craft what an online post may look like to recruit participants as part of an IRB requirement."

A.1.2 Screening Questionnaire Prompts

- "What are potential screening questions for a study on workers cooperatives in the environmental, technology, and cooperative support sectors?"
- "Simplify and create a short list of questions that rule out other participants not involved in environmental, technological, or cooperative support sectors."
- "Add a couple questions to determine if they are in these sectors and focused on equitable climate action."

A.1.3 Survey Development Prompts

- "What are potential survey questions to support this thesis?"
- "Reduce these survey questions to 20 to answer this research question: What are the key operational and structural barriers that worker cooperatives face in the environmental, tech, and cooperative support sectors when scaling their operations and impact on equitable climate solutions?"

A.1.4 Interview Development Prompts

- "What are potential interview questions to support this thesis for each of the three sectors?"

All final instruments were reviewed and edited by the author and received IRB approval prior to distribution or use.

14. Appendix B

B.1 Outreach Email to Environmental Worker Cooperatives

Subject Line: Invitation to Participate in Research on Scaling Environmental Cooperatives for Climate Solutions
Dear [Recipient's Name],

My name is Ana Tabuena-Ruddy, and I am a graduate student at Duke University's Nicholas School of the Environment. I am conducting research as part of my master's thesis focused on the challenges and opportunities for worker cooperatives in the **environmental sector** as they scale their operations and expand their contributions to equitable climate solutions. I am writing to invite your cooperative to participate in this study.

Study Overview:

The research aims to identify the key operational and structural barriers that environmental worker cooperatives face when attempting to scale their impact on climate solutions. We hope to explore:

1. The specific challenges environmental cooperatives encounter when expanding their climate-related projects.
2. The strategies that have been effective in overcoming barriers to growth.
3. How cooperative networks and support systems can aid in scaling operations.

What Participation Involves:

We invite your cooperative to participate by choosing one or more of the following opportunities, with participation in the first two strongly encouraged to provide the most comprehensive insights:

1. **A brief online survey** (15-20 minutes) to share your cooperative's experiences with operational and structural challenges.
2. **A one-on-one interview** (30-45 minutes), conducted virtually, to delve deeper into the unique barriers and successes your cooperative has experienced.
3. **A case study** (optional), allowing us to analyze how your cooperative has navigated growth challenges. Data collection will involve a semi-structured interview focused on your cooperative's growth challenges, climate and equity initiatives, and sector-specific strategies. Interviews will be audio-recorded, transcribed, and thematically analyzed to capture key insights. Participants may review findings to ensure accuracy and completeness.

Participation is completely voluntary, and all responses will remain confidential. Identifying details will be removed unless study participants specifically agree to have their name used, and all data will be securely stored. Interviews may be recorded.

Next Steps:

If you are interested or would like more information, please reply to this email. I will follow up with additional details and arrange the interview or share the survey link at your convenience.

Your insights will be invaluable in understanding how environmental cooperatives can scale their operations and enhance their role in equitable climate action.

Thank you for considering participation, and I look forward to your response!

Best regards,
Ana Tabuena-Ruddy
ana.tabuena-ruddy@duke.edu

Ana Tabuena-Ruddy (she/her/hers)

DEL-MEM Class of 2025
Nicholas School of the Environment
Duke University

B.2 Outreach Email to Technology Worker Cooperatives

Subject Line: Invitation to Participate in Research on Scaling Tech Cooperatives for Climate Solutions
Dear [Recipient's Name],

I hope this message finds you well. My name is Ana Tabuena-Ruddy, and I am a graduate student at Duke University's Nicholas School of the Environment. I am conducting a master's thesis exploring the challenges and opportunities for worker cooperatives in the **tech sector**, specifically as they scale operations and contribute to climate solutions. I would like to invite your cooperative to participate in this important research

Study Overview:
This study focuses on identifying the operational and structural barriers that tech cooperatives face when attempting to scale, particularly with regard to their impact on climate action. We are interested in:

1. The unique challenges that tech cooperatives encounter when scaling their services or products.
2. Strategies and solutions that have been effective in overcoming these barriers.
3. How networks and collaborations can support tech cooperatives in expanding their impact on equitable climate solutions.

What Participation Involves:

We invite your cooperative to participate by choosing one or more of the following opportunities, with participation in the first two strongly encouraged to provide the most comprehensive insights:

1. **A brief online survey** (15-20 minutes) to share your cooperative's experiences with operational and structural challenges.
2. **A one-on-one interview** (30-45 minutes), conducted virtually, to delve deeper into the unique barriers and successes your cooperative has experienced.
3. **A case study** (optional), allowing us to analyze how your cooperative has navigated growth challenges. Data collection will involve a semi-structured interview focused on your cooperative's growth challenges, climate and equity initiatives, and sector-specific strategies. Interviews will be audio-recorded, transcribed, and thematically analyzed to capture key insights. Participants may review findings to ensure accuracy and completeness.

Participation is completely voluntary, and all responses will remain confidential. Identifying details will be removed unless study participants specifically agree to have their name used, and all data will be securely stored. Interviews may be recorded.

Next Steps:

If you are interested in participating or would like more information, please reply to this email. I will follow up with further details and schedule the interview or send the survey link.

Your insights will provide valuable knowledge for understanding how tech cooperatives can overcome barriers and scale their impact on climate solutions.

Thank you for your time, and I look forward to hearing from you!

Best regards,
Ana Tabuena-Ruddy
ana.tabuena-ruddy@duke.edu

Duke
NICHOLAS SCHOOL OF THE ENVIRONMENT

Ana Tabuena-Ruddy (she/her/hers)

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15. Appendix C

C.1 Recruitment via Online Forum: U.S. Federation of Worker Cooperatives (USFWC)

Online Post: Call for Participants – Research Study on Scaling Worker Cooperatives for Climate Solutions

Online Post: Call for Participants – Research Study on Scaling Worker Cooperatives for Climate Solutions

Are you part of a worker cooperative in the environmental, tech, or cooperative support sectors?

We are conducting a research study to understand worker cooperatives' key barriers when scaling their operations and contributing to equitable climate solutions. Your insights could help identify solutions and strategies to overcome these challenges!

What is the study about?

This research, conducted by a graduate student at Duke University's Nicholas School of the Environment, explores:

- The **operational and structural barriers** cooperatives encounter when growing their business and expanding their impact.
- How cooperatives can scale more effectively and contribute to **climate action**.
- The role of cooperative networks and support systems in overcoming these challenges.

Who can participate?

We are seeking participants from worker cooperatives in the:

- **Environmental sector**
- **Tech sector**
- **Cooperative support organizations**

What's involved?

Participation is voluntary and can include one or more of the following:

- **Online survey** (approx. 15-20 minutes)
- **Virtual interview or link to interview questions** (approx. 30-45 minutes)
- **Optional case study** to share your cooperative's growth story

Confidentiality:

Participation is completely voluntary, and all responses will remain confidential. Identifying details will be removed unless study participants specifically agree to have their name used, and all data will be securely stored. Interviews may be recorded.

Interested?

If you're interested or would like more information, please comment below, send a direct message, or email ana.tabuena-ruddy@duke.edu. Your participation will provide valuable insights into how worker cooperatives can scale their operations and impact on climate solutions!

Thank you for considering this opportunity!

Ana Tabuena-Ruddy
Graduate Student
Duke Environmental Leadership and Environmental Management Program (DEL-MEM)
Duke University – Nicholas School of the Environment

C.2 Recruitment via Online Forum with Screening Questionnaire Option

Subject: Participate in a Study on Workers' Cooperatives in Environment, Technology, and Cooperative Support

Are you part of a workers' cooperative or interested in cooperatives focused on environmental services, technology, or cooperative support?

We invite you to participate in a study exploring strategies for scaling cooperatives and enhancing their impact in these critical areas. To join, please start by completing a brief screening questionnaire to determine your eligibility for the study group.

Link to screening questionnaire:
[INSERT LINK TO SCREENING QUESTIONNAIRE]

Your participation will contribute valuable insights to strengthen and grow the cooperative movement.

Participation is voluntary and can include one or more of the following:

- **Online survey** (approx. 15-20 minutes)
- **Virtual interview or link to interview questions** (approx. 30-45 minutes)
- **Optional case study** to share your cooperative's growth story

Thank you for being part of this important initiative!

16. Appendix D

D.1 Screening Questionnaire

Q5. Does your cooperative have any projects or initiatives focused on climate action or sustainability? If so, please describe briefly.

Q6. How does your cooperative incorporate principles of equity or social justice in its climate-related work?

Q7. Name:

Q8. Email address:

SCREENING QUESTIONS

Q1. Are you currently part of a worker cooperative?

Yes

No

Other (please specify)

Q2. Which sector does your cooperative primarily operate in?

Environment

Technology

Cooperative Support

Other (please specify)

Q3. What specific products or services does your cooperative provide?

Q4. Is your cooperative involved in environmental, technology, or cooperative support activities?

D.2 Informed Consent Form and Survey Questions

Informed Consent Form

INFORMED CONSENT FORM

Consent Form to Participate in Research Study on Scaling Worker Cooperatives for Climate Solutions

Key Information

Introduction

Ana Tabuena-Ruddy conducts this research study under the advisement of Dr. Rebecca Vidra of the Nicholas School of the Environment at Duke University.

Why is this study being done?

The purpose of this study is to find out how to scale worker cooperatives in the environmental, tech, and cooperative support sectors so they can be more impactful in delivering equitable climate solutions.

What will I be asked to do?

If you choose to take part in this study, you will be surveyed, interviewed, and given the opportunity to share your cooperative growth story as part of an optional case study. The online survey will take approximately 15-20 minutes, interviews will last around 30-45 minutes, and case study interviews will take about 60-75 minutes. All interviews will be audio-recorded. Data collection for the case study will involve a semi-structured interview focused on your

cooperative's growth challenges, climate and equity initiatives, and sector-specific strategies. Interviews will be audio-recorded, transcribed, and thematically analyzed to capture key insights. Participants may review findings to ensure accuracy and completeness.

How long will I be in the study?

Your participation will depend on the option you choose:

- **Survey:** Approximately 15–20 minutes.
- **One-on-one interview:** 30–45 minutes, conducted virtually, or a secure link to the interview questions sent via email for your response at your convenience.
- **Case study:** Intermittent engagement for up to two months, scheduled flexibly based on your availability.

What are the risks, inconveniences, and benefits of this study?

There are no expected risks to you. Benefits may include learning how to optimize your cooperatives.

Compensation:

There is no compensation for this study.

Confidentiality:

A unique code number will be assigned to all data we collect from you. All data will be stored securely. While the data we collect from this study may be presented at scientific meetings or published in a scientific journal, your identity will not be revealed without your consent.

Collected data may be made public or used for future research purposes, your identity will not be revealed without prior consent.

If a screening form was filled out before receiving this Informed Consent Form, your name and contact information will be discarded after study completion.

There is a possibility that participant identity may be revealed due to deductive

disclosure. If you prefer to remain confidential, I will not describe or quote you in a way that might allow for reidentification.

Voluntary nature of participation:

Participation in this study is voluntary. You can choose not to participate at any point. If you agree to be in the study you may withdraw at any time for any reason.

Whom do I call if I have questions or problems?

For questions about the study, contact Dr. Vidra at 919.259.8439 during regular business hours. For questions about your rights as a participant in this research study, contact the Duke University Campus IRB at 919-684-3030 or campusirb@duke.edu or 919-684-3030. If writing to the Campus IRB, please reference protocol ID# 2025-0160 .

Statement of Consent

If you agree to take part in the study, please check box and type in date below.

. Consent

I agree to take part in the study

. Date

. Please check below to indicate if you agree or not agree to have direct / indirect identifiers used.

AGREE to use participant's name (direct identifiers)

AGREE to share participant's quotes or descriptors that could allow for re-identification (indirect identifiers)

NOT AGREE to have direct / indirect identifiers used

SECTION 1: General Cooperative Information

SECTION 1: General Cooperative Information

Q1. What is the primary sector of your cooperative?

Environmental Services

Technology

Cooperative Support

☐ Other (please specify)

Q2. How long has your cooperative been in operation?

Less than 1 year

1-3 years

4-10 years

More than 10 years

Q3. How many members are currently part of your cooperative?

1-10

11-50

51-100

101 or more

Q4. What stage of growth is your cooperative currently in?

Start-up phase
Growing phase
Established and stable
Declining or restructuring

SECTION 2: Operational Barriers

SECTION 2: Operational Barriers

Q5. What are the most significant operational challenges your cooperative faces?
(Select all that apply)

Lack of access to funding or capital
Limited member engagement or participation
Difficulty in decision-making processes
Inefficiency in day-to-day operations
Limited capacity for marketing and outreach
Difficulty in acquiring new clients or customers
Other (please specify)

Q6. On a scale of 1-5, how would you rate the difficulty of managing decision-making processes within your cooperative?
(1 = Very Easy, 5 = Very Difficult)

Very easy	Somewhat easy	Neither easy or difficult	Somewhat difficult	Very difficult
1	2	3	4	5

Choose

Q7. How often do operational challenges limit your cooperative's ability to scale its activities?

Never
Rarely
Sometimes
Often
Always

SECTION 3: Structural Barriers

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SECTION 3: Structural Barriers

Q8. What are the most significant structural challenges your cooperative faces when trying to scale?
(Select all that apply)

Difficulty accessing external funding
Regulatory challenges or lack of supportive policies
Internal governance issues
Market competition from non-cooperative entities
Limited access to cooperative networks or alliances
Other (please specify)

Q9. How has your cooperative's structure (e.g. governance, legal form) impacted its ability to scale?

Positively

Negatively

No impact

Q10. On a scale of 1-5, how significant are financial barriers (e.g., lack of funding, access to capital) in limiting your cooperative's growth?
(1 = Not significant, 5 = Extremely significant)

	Not significant	Slightly significant	Moderately significant	Very significant	Extremely significant
	1	2	3	4	5
Choose					

SECTION 4: Impact on Equitable Climate Solutions

SECTION 4: Impact on Equitable Climate Solutions

Q11. To what extent is addressing climate change and providing equitable climate solutions a core part of your cooperative's mission?

Not at all

Somewhat important

Important

Very important

Central to our mission

Q12. What are the primary barriers preventing your cooperative from having a

greater impact on equitable climate solutions?
(Select all that apply)

Lack of funding for climate initiatives
Difficulty attracting climate-focused clients or partners
Insufficient expertise in climate solutions
Regulatory challenges in implementing climate projects
Other (please specify)

Q13. On a scale of 1-5, how much does your cooperative's current size limit its ability to contribute to equitable climate solutions?
(1 = Not at all, 5 = Extremely limited)

	Not at all	A little limited	Moderately limited	Very limited	Extremely limited
	1	2	3	4	5
Choose					

SECTION 5: Strategies and Support Systems

SECTION 5: Strategies and Support Systems

Q14. What external support systems would most help your cooperative overcome barriers to scaling?
(Select all that apply)

Access to cooperative networks or federations
Improved access to funding and capital
Policy reforms or regulatory support
Access to training and capacity-building programs

Partnerships with other cooperatives or organizations

Other (please specify)

Q15. Has your cooperative engaged with any cooperative networks, federations, or alliances for support?

Yes

No

Considering it

Q16. If yes, how helpful has this engagement been in overcoming operational or structural barriers?
(1 = Not helpful, 5 = Very helpful)

	Not helpful	Slightly helpful	Moderately helpful	Helpful	Very helpful
	1	2	3	4	5
Choose					

SECTION 6: Governance and Decision-Making

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SECTION 6: Governance and Decision-Making

Q17. What governance challenges has your cooperative faced when scaling its operations?
(Select all that apply)

Decision-making delays or inefficiencies

Disagreements among members

Difficulty maintaining democratic governance while growing

Inadequate leadership or management

Other (please specify)

Q18. On a scale of 1-5, how satisfied are you with the current decision-making process in your cooperative?
(1 = Very dissatisfied, 5 = Very satisfied)

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied
	1	2	3	4	5
Choose					

SECTION 7: General Reflections

SECTION 7: General Reflections

Q19. What do you see as the most critical barriers to your cooperatives growth and impact on climate solutions?
(Open-ended)

Q20. What additional resources or strategies do you believe would most effectively help your cooperative scale its operations and impact?
(Open-ended)

DEMOGRAPHIC / BACKGROUND QUESTIONS

Demographic / Background Questions

Q21. How long have you been a member or worker in this cooperative?

Q22. What is your role within the cooperative?

Q23. What is the geographic location or primary area served by your cooperative?

Q24. What is your age range?

18-24
25-34
35-44
45-54
55-64
65+

Q25. What is your racial or ethnic background? (Optional)

Q26. What is the reason you joined or started a worker cooperative?

D.3 Interview Questions for Worker Cooperatives in the Environmental Sector

RESEARCH GOALS

RESEARCH GOALS

. This study aims to understand how worker cooperatives in the environmental sector can scale their operations and impact.

This research is part of a broader study investigating worker cooperatives in the environmental, technology, and cooperative support sectors.

Environmental cooperatives have the potential to lead in addressing climate challenges by promoting sustainable practices, regenerative systems, and localized solutions.

We want to learn how these cooperatives can expand their reach and amplify their role in building a more equitable and sustainable future.

SECTION 1: Introduction and Background

SECTION 1: Introduction and Background

Q1. Can you briefly describe your cooperative's mission and primary services in the

environmental sector?

Q2. How does your cooperative contribute to addressing climate change and equitable climate solutions?

SECTION 2: Operational Barriers

SECTION 2: Operational Barriers

Q3. What are the most significant day-to-day operational challenges your cooperative faces in scaling its activities?

Q4. How do these operational barriers impact your cooperative's ability to expand your climate-related projects or services?

SECTION 3: Structural Barriers

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SECTION 3: Structural Barriers

Q5. What structural challenges (e.g. governance, financial access, legal frameworks) have you encountered while trying to scale your environmental projects?

Q6. Have you faced regulatory challenges when working on climate solutions? If so, how have these impacted your operations?

SECTION 4: Impact on Climate Solutions

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SECTION 4: Impact on Climate Solutions

Q7. In what ways has your cooperative been limited in contributing to equitable climate solutions due to size or resources?

Q8. What would need to change operationally or structurally for your cooperative to make a more significant impact in this area?

SECTION 5: Networks and Support Systems

SECTION 5: Networks and Support Systems

Q9. Has your cooperative engaged with any cooperative networks, environmental alliances, or partnerships? How have they supported your growth or climate-related initiatives?

Q10. What kind of external support systems or networks would most benefit your cooperative in overcoming barriers to scaling?

OVERCOMING BARRIERS

Overcoming Barriers

Q11. Can you share a specific example where your cooperative successfully

overcame an operational or structural barrier? What was key to that success?

Q12. What strategies or solutions do you believe would most help environmental cooperatives scale their operations and enhance their impact on climate solutions?

Future Outlook

Q13. Looking ahead, what do you see as the greatest opportunities for cooperatives in your sector to scale and have a greater impact on equitable climate solutions?

D.4 Interview Questions for Worker Cooperatives in the Tech Sector

RESEARCH GOALS

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RESEARCH GOALS

. This study explores how tech worker cooperatives can scale to provide ethical and equitable alternatives in a field often dominated by Big Tech.

This research is part of a broader study investigating worker cooperatives in the environmental, technology, and cooperative support sectors.

Tech cooperatives have the potential to harness innovation while prioritizing privacy, autonomy, and community benefit.

This research seeks to understand how these cooperatives can grow and thrive as models of fair and sustainable technology development.

SECTION 1: Introduction and Background

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SECTION 1: Introduction and Background

Q1. Can you describe your cooperative's role in the tech sector and its specific

services or products?

Q2. How does your cooperative align its work with climate solutions or sustainability efforts?

SECTION 2: Operational Barriers

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SECTION 2: Operational Barriers

Q3. What are the biggest operational challenges your tech cooperative faces in scaling its products or services?

Q4. How do you manage challenges such as keeping up with technology advancements, training members, or expanding client outreach?

SECTION 3: Structural Barriers

SECTION 3: Structural Barriers

Q5. Have you encountered structural issues, such as securing funding or managing governance, that have made it difficult to scale your tech cooperative?

Q6. What role do regulatory frameworks play in your ability to scale or innovate, particularly in relation to contributing to climate solutions?

SECTION 4: Impact on Climate Solutions

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SECTION 4: Impact on Climate Solutions

Q7. How does your cooperative incorporate climate-conscious practices or products, and what barriers limit your contribution to climate action?

Q8. What would enable your tech cooperative to more efficiently scale solutions that address climate change?

SECTION 5: Networks and Support Systems

SECTION 5: Networks and Support Systems

Q9. Has your cooperative collaborated with other tech cooperatives or networks? How has this collaboration helped or hindered your ability to grow?

Q10. What kind of cooperative networks or tech ecosystems would you find most helpful in scaling your operations or tackling climate challenges?

OVERCOMING BARRIERS

Overcoming Barriers

Q11. Can you share a case where your tech cooperative overcame a significant scaling challenge? What approach did you take to address this barrier?

Q12. In your experience, what are the key strategies that tech cooperatives need to grow sustainably while contributing to climate solutions?

Future Outlook

Q13. Looking ahead, what do you see as the greatest opportunities for cooperatives in your sector to scale and have a greater impact on equitable climate solutions?