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Rural Sustainable Prosperity: Social Enterprise Ecosystems as a Framework for Sustainable Rural Development

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Abstract: The fourth wave of economic development has ushered in social enterprises (SEs) that have the potential to contribute to sustainable development goals (SDGs) in rural regions that have not prospered under the economic development strategies of the past. This study examines three SEs that have emerged at different times in Appalachian Ohio, a region recognized as a rural area recovering from the environmental and health consequences of extractive industries and poverty over the last century. The social entrepreneurial ecosystem (SEE) in this region has begun to thrive recently, rendering now a crucial time to evaluate the conditions that have led to success. Using qualitative methods, three cases were coded to identify whether present-day SEs in rural Appalachia (1) realize values for natural resource stewardship and community wellness in addition to economic profits (a triple bottom line), (2) attract external funds that are retained in the local economy, and (3) align with SDGs. Evidence of these qualities in SEs manifested in different ways across the three cases. Stage two coding revealed findings that (1) the university acted as a catalyzing agent and (2) collective action by generational families was foundational for the social capital that kick-started each case. As the natural capital recovers in the region, opportunities for the SEE to nurture new enterprises aligned with the triple bottom line will increase SDGs. The SEE of Appalachian Ohio offers a model for sustainable development in dispersed rural locations.

Keywords: social enterprise ecosystems; rural development; sustainable development goals

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1. Introduction

Some rural, coal-impacted communities in Appalachia face uncertain futures not only in relationship to environmental sustainability but also to basic viability. The legacy of coal mining and other extraction industries in rural areas has left landscapes and people scarred by social and environmental injustices. Appalachian Ohio, for example, faces barriers to environmental sustainability, including reliance on extraction industries such as coal, timber, and shale gas [1,2]; outsized environmental impacts from those extraction industries [3,4]; changing land use patterns [5]; reliance on fossil fuel power production for employment and its tax base [6,7]; and policies which incentivize the extraction industries and fail to hold private corporations responsible for mitigating environmental disaster [8]. While struggling with barriers to environmental sustainability, communities also face barriers to social and economic sustainability [9], including loss of human capital to outmigration [5,10–13]; policies encouraging urbanization [5]; an aging and more impoverished population [14]; poor health outcomes associated with the coal industry [15]; reliance on the extractive industry in lieu of place-based entrepreneurship [16].

Policymakers have increasingly turned to entrepreneurship as a vehicle for rural community viability [17,18], and in more recent years, the focus on land reclamation and entrepreneurship, including ecotourism, is touted as a way for rural communities to increase revenue while also preserving the land which defines residents' sense of place and identity [5]. Leveraging entrepreneurship to effect a "triple-bottom-line change"

simultaneously enables social and environmental benefits as well as profitability. These rural social enterprises fall into a critical nexus of community and economic development while also recognizing the need for sustaining natural resources that support health [19,20]. Thus, social enterprises and the ecosystems out of which they arise represent an important place for inquiry into the sustainable development of rural communities.

In this paper, we detail an applied case of the social enterprise ecosystem (SEE) rooted in Appalachian Ohio and highlight three specific social enterprises addressing issues of sustainability in a coal-impacted region. First, we complicate and debunk common understandings of rural attitudes toward sustainability, especially environmental sustainability. Second, we take a historical view of the ways in which previous approaches to economic development (and community development) have insufficiently addressed rural sustainable development. Next, we present a methodology for evaluating the impact of SEEs using case studies and provide an analysis of True Pigments, Passion Works, and Stirling Ultracold. Finally, we propose a framework for rural development that includes environmental sustainability as key to the fourth wave of rural community economic development, especially as it manifests in the form of small, locally based social enterprises and regional social enterprise ecosystems.

1.1. Rural Sustainability

The concept of sustainable development, described first in the 1987 Brundland Report, attempted to reconcile environmental protection and preservation with social goals and development needs. Since the Brundland Report, both the concept of sustainability and the primacy of the dimensions of sustainable development—environmental, social, and economic—have been the subject of debate as international and national governing bodies struggle to provide frameworks wherein the ability for humans to thrive and economic development fit within planetary, ecological limits [21,22]. The United Nations Sustainable Development Goals (UNSDGs), adopted in 2015, were developed to provide a global, coordinated effort toward the goal of balancing the requirements of environmental protection and the desire for improving human welfare through modernity [5,22]. The UNSDGs prioritize human welfare and the social goals of "eradicating poverty in all its forms and dimensions"; a priority that highlights the tension inherent in the larger sustainable development conversation: how to continue economic and social development while preserving environmental resources for infinite future generations [21] (p. 3439) and [23].

Where urban areas and national entities (e.g., impact investing funds) have more readily embraced sustainable development planning and the UNSDGs [9], the guiding force of the UNSDGs and the application of sustainable development practices in smaller, rural communities can seem distant to, irrelevant for, or in conflict with expectations of the citizens, demands of business, and responsibilities of community organizations. The patterns of rural United States voters and their government representatives illustrate a stark rural/urban divide in attitudes toward environmental sustainability and policy. People from urban and suburban geographies are more likely to acknowledge climate change, understand that climate change is caused by humans, and support environmental protection policies [24–26].

Some rural leaders, professional associations, and voters have recently taken action against the expansion of EPA policy designed to protect natural resources and human health, including the Clean Water Act [26]. Most recently, in Ohio, following state legislation that more strictly limits renewable energy development than it does fossil fuel energy, ten rural localities banned wind and solar "farms" in their counties, actions that to urban voters seem backward, myopic, or irresponsible [27,28]. In addition, rural industries such as agriculture are perceived more negatively by urban and suburban residents, a perception that results in laying undue blame and responsibility at the feet of rural people for environmental degradation [29]. In turn, rural voters perceive urban priorities toward environmental protection and preservation as a threat to rural livelihoods and ways of life [26].

However, voting patterns and the media's characterization of rural people as anti-environmental protection belies the much more complex and sophisticated reality of the rural relationship with the natural environment and the desire to sustain it for future generations [26]. Studies across the disciplines consistently demonstrate the importance of place and natural environment to rural identities and actions [26,30–33]. Place identity and connection with the environment are stronger in rural residents than suburban and urban residents [26,30–33], which informs a sense of long-term "legacy and stewardship" that rural stakeholders feel is missing from urban centers and corporate priorities [26]. Within rural communities, rural professions that rely on utilizing natural resources often come into direct conflict with urban in-migrants seeking to preserve land for use as a recreational amenity or aesthetic [5,34]. Moreover, when considering changes to more sustainable practices, those practices might be impractical, or the costs incurred by rural residents can be much higher than mitigating practices for individuals in high-density areas [25]. Where rural industries like agriculture are targeted as driving climate change, the people working in those industries might be less able to afford or have the capacity to switch to more sustainable alternatives [25,29]. Where the disproportionate impact of climate change and environmental degradation falls on rural people after centuries of fueling progress in urban centers, mandates for sustainability in these rural places may be ill-received [26].

1.2. Barriers to Sustainability: Historical Approaches to Rural Development

Although a divide in rural/urban attitudes toward environmental sustainability is demonstrated in policy and public perception, personal concern for protecting the natural environment is almost equal between urban and rural voters [26]. The disconnect in rural attitudes toward environmental policy and climate change stems from a distrust of federal policy and lack of corporate responsibility [26], attitudes rooted in the experience of the negative impact of historic urban-centric policies and exploitive practices of extraction industries.

Rural communities once dependent on a single, extractive industry (e.g., coal company towns) have previously fought companies over exploitive labor and environmental practices, battles that have left persistent and lingering scars on the people and landscape. In Appalachia, examples such as the Battle of Blair Mountain, where the federal government (and troops) defended the rights and activities of the mining corporation at the cost of the lives and welfare of local citizens, typify the events that have sowed centuries of distrust for rural residents. The use of rural areas both historically and currently as "sacrifice zones", areas environmentally degraded in order to fuel development and profit elsewhere [1–3,35], has left these areas with long-term negative social, environmental, and economic impacts, such as negative health outcomes and resident quality of life [3,5,36], falling property values and subsequent tax base [37,38], increasing crime [2], and generational poverty [39].

First-wave economic development policy sought to spur rural economic development through "smokestack chasing" or attracting large firms to rural areas through large incentive packages and tax abatement [17,40–43]. First-wave economic development polity emphasizes the number of jobs created; a tactic used by politicians to demonstrate political effectiveness in short terms in office. However, similar to the historical example of coal company towns, rural areas dependent on a single, large employer, such as a manufacturer, power plant, or extraction industry, are vulnerable to external disruptions [33]. First-wave economic development focuses on the relocation and attraction of large, often multinational corporations and industries, which in many cases extract not only the natural resources but also the bulk of financial resources, as profit is extracted and funneled to the corporate headquarters and shareholders, usually located in a far-away city [5].

The academic literature reveals that the promise of first-wave economic development policy, seen as a way to solve rural poverty [44] via classic large industry attraction incentives that produce secondary economic benefits by employing a significant workforce (as long as the attracted entity stays in business) has been largely unrealized [42,43]. Boom and bust extraction industries and overseas outsourcing to cheaper labor markets

created a desperate need in rural communities for increased public aid, social welfare programs, and community development [44,45]. Mitigating these unaddressed negative social and environmental industrial impacts has per force fallen to the public–social ecosystem: government entities; non-profits; faith groups; volunteer groups; and non-governmental organizations [44,46].

1.3. A New Generation of Rural Prosperity Approaches: The Ecosystem Perspective

As it became clear that lasting, place-based employment derived most significantly from smaller enterprises [47], second-wave economic development focused on attraction and retention, and third-wave economic development subsequently focused on systemic development, including entrepreneurial tool development, to best encourage a diverse multiplicity of strong rural enterprises [17,40]. Distinguishing between development and growth in new approaches to rural prosperity emphasized the generative role of supporting networks, clusters, and structural change [41]. Partnerships between public and private sectors became a hallmark of the third wave, as policy shifted to support synergistic relationships between enterprises and organizations that created innovative clusters, thus building and sustaining an entrepreneurial ecosystem (EE). In the Appalachian context, the last half-century's struggles with effective development point to the importance of a genuinely diverse enterprise base [48–50].

However, traditional EEs are criticized as having "indifference of the sustainability dimension", or consideration of the bi-directional impact of entrepreneurship, economic development, and community well-being [51] (p. 1048). Further, research on rural EEs that followed second- and third-wave economic development found that the conception of EEs and entrepreneurship must be adjusted for rural contexts [31,33,52–55]. For example, "effective entrepreneurial leadership" and educational resources for developing individual entrepreneurs in rural contexts address the uniquely rural barrier of the lack of ready entrepreneurs in a dispersed population [32] (p. 936). Missing from the literature on EE models is the rural importance of natural capital assets to other community capital and the system's role in social capital, place attachment, and rural identity in rural community ecosystems [31–33]. The existing literature on American rural EEs identified primary characteristics, including civic leadership, strong interrelationships between founding entrepreneurs, and the importance of dedication to place [56]. In the Appalachian context, economic development strategies that were originally created for more urban settings neglect the paramount importance of location, connectivity, and social capital [57].

1.4. Rural Sustainable Development as Fourth-Wave Economic Development

The key elements of fourth-wave economic development are under ongoing consideration in the academic literature [40,51]. Current thinking emphasizes that economic vitality is a result of traditional factors in addition to, and overlaid by, place-based community development and focus on quality of life. To date, a focus on environmental sustainability and rural responses to climate change is missing from the debate. Where rural voters express distrust in environmental policy and conservation activist groups, they also see environmental protection as compatible or sometimes even preferable to economic growth [26]. The nuances of place identity and multiple concurrent land-use choices inform a stewardship ethic toward the natural environment and could inform sustainable development models for fourth-wave economic development [30,34,58].

The relationship with the natural ecosystem exhibited by rural people is often overlooked because these transactions are not captured in traditional, quantifiable markets. In rural places, markets tied to the natural landscape are smaller, seasonal, place-based, and community-oriented in nature, thereby representing ways of life not linked to the goals of exponential growth, exit, or urbanization. However, the social capital and cultural capital created through the relationship with the natural ecosystems create flexible adaptation to exogenous shocks [59], well-being for residents [60], reduced outmigration [61], and attraction for in-migrants to rural communities [62].

Moreover, research on sustainable development practices that lead to rural prosperity is needed. Where industries located in rural geographies have been targeted or villainized for unsustainable practices, less documented in the academic literature and mainstream media are asset-based approaches to sustainable development that lead to holistic rural economic, social, and ecological prosperity [26,29,63]. Urban approaches to sustainability, which focus on density, city planning for walkability, mixed-use space, and social inclusion, are not suitable for a rural context and must be adjusted or reimagined for geographic isolation and dispersed, smaller populations and the resultant unique set of assets and barriers [9,64]. This study seeks to address this gap in the research and contribute an asset-based view of rural sustainability.

1.5. Research Questions

In light of the signals emerging for fourth-wave economic development, this study investigates the research questions:

1. In what ways do social enterprises contribute to the elements of sustainable development in their rural community: community well-being (people); natural resources (planet); and economic growth (profit)?
2. What elements of social entrepreneurial ecosystems (SEEs) are most important to support rural enterprises to achieve triple bottom-line impacts (people, planet, profit)?
3. In what ways do rural enterprises leverage social entrepreneurial ecosystems (SEEs) to attract external funds to rural enterprises?

More specifically, this study will assess three case studies previously reviewed as social enterprises [65]) to determine (1) impacts on community well-being, natural resources, and economic growth; and (2) evidence of successfully attracting external investments.

2. Materials and Methods

Our case examples illustrate enterprises working toward community sustainable development in creating a thriving, regenerative, rural ecosystem. Using the theoretical framing of ecosystems, these case examples illustrate the sustainable development potential of rural enterprises in the ecotone, the space in which economic development and community development intersect as circumscribed by and aligned with the natural ecosystem [65].

In line with the importance of the natural ecosystem to rural people and places, our theoretical framework echoes scholars such as Cho et al. [64] in returning to a more complex model of ecosystem theory. Our framework resists a diluted ecosystem's metaphor for social systems and more closely aligns with the natural sciences from which social sciences adapted the concept. Prior studies already reference the specifically rural perspective, which instead of perceiving the natural environment solely as a contextual backdrop, takes it into consideration as a key formative player in the ecosystem [66,67]. This study adds the concept of ecotones as a significant place for sustainable development.

An ecotone is a biological concept denoting the "transition spaces" where ecosystems overlap (e.g., riparian zones, grassland–forest transition, etc.), characterized by higher biodiversity and potential for resilience and ecosystem services as a result of that overlap [68,69]. Ecotones contain elements of both ecosystems and, as sites of increased diversity and complexity, offer adjacent ecosystems a buffer that enhances resiliency in times of change. Enhanced diversity permits a species growing in an ecotone to adjust more readily during external shifts or disruptions. At the same time that new species emerge in ecotones, many other species pass through the ecotones, interacting in ways they do not when siloed in their individual ecosystem.

2.1. Theoretical Framework: Social Enterprises in the Ecotone

The SEE occurs at the ecotone between economic development and entrepreneurial ecosystems and community development on the one hand and social services ecosystem on the other [65]. Social Entrepreneurial Ecosystems (SEEs) arise from an interdisciplinary (systems) perspective that might point to sustainable economic solutions [70]. Social

enterprises endeavor to solve complex community problems in innovative ways through entrepreneurship that creates an impact on people, the planet, and profits [20] in a way that considers planetary resource limitations rather than extractive processes [51,71–74]. The SEE is a relational system comprised of social enterprises and the contextual network of actors, organizations, and cultural forces that support the social enterprise ventures and the social, environmental, and economic impact the enterprises seek to create.

Social enterprises operate between the ecosystems of both economic development and community social change. Social enterprises overlap traditional entrepreneurial ecosystems with community development ecosystems, creating spaces rich in social ties, innovation, and shared purpose [75–78]. Research into the nature of sustainable or social enterprises and the ecosystem elements that support their success is nascent and lacks cohesion [75,79]. For example, the literature alternately refers to these triple-bottom-line enterprises as sustainable enterprises, not social enterprises. Whereas the literature on so-called social enterprises is reflected more in mainstream usage, the literature on sustainable enterprises and SEEs better aligns with the UNSDGs and environmental sustainability goals [51,71–73,79,80]. Referred to in this study as social enterprises, these organizations, their supporting partnerships, and the organizations they impact combine priorities of place, people, and profit-making business activities in consequential ways.

Recently, the literature focused on rural prosperity has begun to transform ideas of economic growth as the sole measure of success or driver for the health of rural areas [17,81]. A series of chapters in the 2021 *Investing in Rural Prosperity* text put out by the Board of Governors of the Federal Reserve System focuses on examples and policy recommendations that go beyond "simply *creat[ing] jobs*, [and instead] consider *what kind of jobs* are being created, and whether they reinforce connections to place and community wealth building" (p. 218). New policy strategies focusing on sustainable approaches to rural sustainability include divesting from first-wave attraction and retention practices that "promotes investing in companies" instead of "investing in communities" [8] (p. 385), regionalism [5], creating and measuring impact to attract impact investors, and continuing to diversify economies, particularly around natural capital assets [5,17]. Although rural SEEs face barriers, they also offer key insights into addressing rural prosperity through sustainable development needs, including social justice, environmental justice, and rural lifeways.

2.2. Methods

This study blended quantitative contextual data from the coal-impacted region with qualitative case study research to reflect the extended case study approach [82,83]. The three case study examples were identified from a list of enterprises in the Appalachian Ohio SEE by matching three key criteria: (1) having a stated mission or explicit business practice emphasizing ecological sustainability and/or sustainable development; (2) clear traversing of the boundaries between community development and economic development; and (3) at least five sequential years' operation and more than the founding employee. These three criteria were established to fit the study's purpose of extracting key factors of successful social enterprises aimed at creating rural sustainable development. Sources included public material such as websites, annual reports, and media, as well as the authors' applied research and experience as regional residents and practitioners. The case examples were organized into detailed timelines to map the chronological process of enterprise development [84].

To address research question one, the chronological data were coded using three a priori codes guided by the research questions and theoretical framework. The nodes along the timeline were coded according to three a priori codes, including the triple-bottom-line sustainability goal of social enterprises: people, planet, and profit [85,86]. Evidence not fitting the a priori codes was moved to a separate category of conceptually important information to be integrated into stage two coding [86].

The evidence in initial a priori code clusters, including evidence not fitting a priori codes but classified as conceptually important, was coded in a second stage process to

answer the remaining research questions. Patterns, themes, and frequency across case examples were identified, sorted, summarized, and labeled [85,86]. The authors triangulated evidence of ecosystem support from second-phase coding with the theoretical framework, quantitative data, and evidence from first-phase coding clusters [86]. Throughout first- and second-phase coding, memoing by researchers guided conceptual development, summaries, and synthesis of learning from across case study examples [85].

Analysis of these data yielded findings that speak to the ways in which rural social enterprises both create opportunities for sustainability and turn the fourth wave of economic development toward sustainable development, which includes social and environmental dimensions with the economic dimension. In the remaining sections, we detail pieces of the quantitative context of Appalachian Ohio, followed by a thorough description of the qualitative case examples and findings that speak to a framework for rural sustainable development [87].

2.3. Context

Appalachian Ohio was chosen as the context for this study because the region is a microcosm of longstanding trends. The Mid-Ohio Valley is cited in academic literature [88,89] and federal government studies [17] as a model for entrepreneurship in rural areas. Regional social inequities were occasioned by boom-and-bust economic development. Yet there is a complex interchange between economic reliance on such development while simultaneously challenging its source (e.g., through labor unrest and environmental activism). Following the theoretical framework outlining the study, the context of this study was limited to the regional SEE bounded by geographic place (the natural ecosystem). In Appalachian Ohio, the specific EE cluster, public sector entities, and the SEE arising at the ecotone of these two systems are bounded by the rural geography of a coal-impacted ecosystem that poses many sustainable opportunities and challenges to community sustainability.

The paradoxical balance of environmental injustice and economic livelihood is not unique to Appalachia. The natural resource curse demonstrates that regions with natural resources, particularly fossil fuels [89], often have correspondingly higher poverty levels [90]. Even when studies have found significant employment effects related to natural resources like the wood industry [91], the Appalachian Ohio wood industry consisted of jobs that were lower paying and lower in the value chain [92]. The cyclical effect of the natural resource curse impacts the stock of human capital [93,94]—and presumably, by extension, the stock of prospective entrepreneurs. Studies examining entrepreneurship in the Appalachian Ohio region have found that a more nurturing and supportive environment was required to assist companies with traditional entrepreneurship activities like qualifying for venture capital [88].

2.4. Social Enterprise Case Descriptions

2.4.1. Case 1: True Pigments

The social enterprise, True Pigments, arose from a cross-sector, cross-college technological innovation facilitated by Ohio University. The technology removes AMD through a unique non-chemical process. Current practices to remove AMD cut off water flow from contaminated streams in order to extract valuable but toxic minerals. True Pigments' technology was developed as a sustainable alternative to existing AMD mitigation practices. With True Pigments' innovation, streams impacted by AMD pollution are restored to a state that supports life with the added ability to act as a clean water source as clean water is allowed to flow downstream [95].

True Pigments' technology was created not only with the explicitly stated mission of ecological sustainability, but the enterprise has grown, receiving the necessary financial and human capital to expand and connect to markets, under a local nonprofit that started as a community development organization: Rural Action. Rural Action began as a regional advocacy group focused on organizing a community response to the negative impacts

of longwall mining [96]. Over their 40 years of activism, Rural Action has grown from its focus on mitigating industrial pollution into a catalyst for multi-pronged sustainable development for the Appalachian Ohio region.

The True Pigments enterprise began as traditional university R&D, spearheaded by university professors who validated the extracted pollutant as paint pigment for use in fine artworks. The university's commercialization collaborator first steered the research toward the traditional economic ecosystem, attempting to pursue commercialization and funding options through its protectable innovation. Yet, this business model initially failed the State's competitive technology validation program and failed to secure the needed venture support from traditional venture capital funds.

After rejection in traditional EE, a strong regional community development organization (Rural Action) acquired the rights to the intellectual property. Rural Action approached the enterprise from a different perspective: as a collaboratively co-created solution to a key environmental problem. Rural Action orchestrated a public/private funding partnership to secure the site and equipment for an in-situ concept validation at a major drainage source.

Despite its initial failure in the EE, True Pigments accelerated within the SEE ecotone. Successful business modeling resulted in a blend of community development, ecological sustainability, and economic development potential to underpin a viable revenue model [95].

2.4.2. Case 2: Passion Works

Passion Works is a social enterprise centered on the creative arts economy. Passion Works employs 38 individuals, including 24 artists with developmental differences. Passion Works creates one-of-a-kind artworks. The signature product of Passion Works is a 3-D flower constructed from sheet metal sourced from local businesses in a circular economy approach. Passion Works's supply chain sourcing, inclusive employment practices, and role in diversifying the local economy through art activities include elements of sustainability for social, economic, and environmental aspects of sustainable development.

Passion Works started in 1993 as a program provided by a federally funded community social service "dayhab" facility. This publicly-administered facility drew Medicaid funding to serve the differently-abled. A visionary local artist with a family background in such service initiated vibrant arts programming that was equally well-received by those served, their families, and the community at large. But a 2016 modification to Medicaid funding required separation between funded agencies and program monitoring, causing the local administrative unit to divest from Passion Works.

This potential cessation of the Passion Works program galvanized a key and powerful public/private partnership that included individual Board members of the original administrating agency, university enterprise development professionals, and regional philanthropic funders. The Passion Works program pivoted and reemerged from this collaboration as a strong, independent nonprofit social enterprise operating under a viable growth-and-sustainability expansion model. Today, Passion Works's revenue model is split nearly evenly between sales and donations, with a small percentage (14%) of income from grants.

In the traditional EE and economic development, Passion Works provides living wage incomes to difficult-to-employ persons, occupies and operates a storefront in a historic town center, provides products to people in the community, and circulates financial capital in the local economy. Furthermore, Passion Works is working to scale and replicate the executive team's creative abundance operating model, a development model that creates cultural capital through place-making [63].

2.4.3. Case 3: Stirling Ultracold

A major regional economic event—BioLife Solutions' acquisition of Stirling Ultracold—was made public in SE Ohio in 2021. The venture exit not only created national headlines due to its importance in the post-pandemic landscape but placed investment capital in

multiple shareholders' bank accounts. This fortuitous endgame started in Appalachian Ohio with the invention (by a mechanical engineer, inventor, and junior university lecturer) of the "free-piston Stirling engine", a machine capable of ground-breaking energy-efficient low-temperature cooling. At the time of its invention, however, R&D costs and uncertainty of the engine as a market solution led the university to allow the university professor to retain the patent rights. As a result of ingenuity and market forces in the private sector, the engine eventually met success in multiple sectors.

In a traditional EE trajectory, Ohio University would have provided Stirling Ultracold with business advisory services and pre-seed funding. However, the corporate ethos of the SE Ohio Stirling firm was firmly rooted in a commitment to its community in SE Ohio both as an actor in economic development through employing people in the region and also in the community collaboration process that supported the growth of the firm and the environmental benefits of the very low energy input requirements of the product.

Contrary to its effect in urban settings (with their ready access to developed supply chains and a qualified workforce), the impact of venture exits on rural communities can be economically devastating. Rural corporate acquisition targets generally understand that investment 'success' will mean the establishment of new headquarters in a more accessible urban locale—and thus the loss of local jobs and their key secondary and tertiary economic benefits. However, because of Stirling Ultracold's commitment to the community, a condition of its sale was retaining an in-situ manufacturing facility. Prioritizing continued positive economic impact for its natal community represents a key facet of rural sustainable development derived from the firms' locally-focused, half-century-long history.

3. Results

In analyzing the chronological [84] and evolutionary development [64] of enterprises arising from the SEE ecotone, our analysis of the three social enterprise case studies produced evidence of measurable outcomes in the three areas of sustainable development (people, planet, profit) (See Table 1). The results of the second phase of analysis detailed the ecosystem elements similar across all cases that helped to facilitate outside investment and scalable success (See Table 2).

Table 1. Ways case example, social enterprises contribute to the elements of rural sustainable development.

	True Pigments	Passion Works	Stirling Ultracold
Community well-being (people)	Innovation addresses environmental injustice: community impacted by AMD	Arts-based employment for adults with developmental differences; second chance employment Placemaking activities, inclusive events, cultural capital through art creation	Condition of exit retains local jobs and manufacturing site in a rural place
Natural resources (planet)	Pollutant is removed from seepage, and iron oxide is used to create paint pigment	Product created from reused materials from local and nonlocal sources	Primary product uses low energy input due to Stirling technology
Economic growth (profit)	Paint sold through major retailers	Operates brick-and-mortar storefront in the downtown area Multiple revenue-generating products and services Employers of hard-to-employ persons	Created from a "cluster" of spinoffs related to initial technology; SE followed a traditional growth model

Table 1. *Cont.*

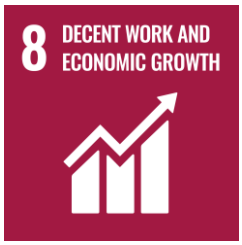
	True Pigments	Passion Works	Stirling Ultracold
UNSDG			

Table 2. Elements of ecosystem support are necessary for rural sustainable development.

	True Pigments	Passion Works	Stirling Ultracold
University as a site of social capital creation	Facilitates collaboration between researcher, an organization to house business operations, and funders	Provides technical and planning services to enable the shift to the SEE model and expansion	Provides human capital and connections to CD interests that guide C-suite commitments
Impacts leveraged for outside funding	Traditional IMPLAN analysis used in government grant applications SROI analysis used in messaging to impact investors	SROI analysis is used to communicate hard-to-measure social impacts	C-Suite commitment to economic and social impact in the region preserves jobs in exit negotiations
Regional champions invested in long-term	Regional community development and family foundations invested for 20+ years to support growth until VC and impact investing funding could be sought	Key champions foresee policy failure and act proactively	Stirling cluster technologies remain anchored in a rural location; many C-Suite and employees live, work, raise families in a rural place

3.1. Social Enterprises' Triple-Bottom-Line Approach to Sustainable Development

The bulk of rural resistance to environmental policy and federal protection measures comes from a distrust that the policies made will favor a "one-size-fits-all" approach and will fail to allow a tailored approach that takes into account local knowledge and culture [26]. Our case studies confirmed that previous approaches to economic and community development were insufficient to support or capture the success of the case examples. The case examples here were enabled to contribute toward the social, environmental, and economic thriving of the rural community when organizations, information, and priorities from both the economic development ecosystem and community development ecosystem overlapped to create a new space for innovation and support.

The moment when operations in either ecosystem failed or when complex problems developed where the government failed to act, and market forces did not act to the benefit of rural communities, rural entrepreneurs took an asset-based approach to spur enterprise development [97–99]. Consistent with other studies [84], our case examples included social entrepreneurs that combine multiple community capital with market logic to create solutions to intractable problems [97].

Global frameworks struggle to detail "how citizens can integrate critical regenerative and distributive projects without undesired socio-ecological side effects for the region" [98] (p. 2). Our study points to the importance of individual entrepreneur's opportunity recognition and the significant supporting role of regionally-based players (family offices, experienced retirees and other residents, and business service providers) as a pathway toward triple-bottom-line success [99]. Although none of the enterprises in our rural area formally connect their activities to the UNSDGs, the mission and impact of their operations clearly address the global goals and could contribute toward the UN target

indicators, even given the relatively small impact numbers considering the rural context. More specifically, the case of True Pigments addresses UNSDG 6.3 and 6.6, which deal with reducing pollution in waterways and restoring water-based ecosystems [100] (p. 8). Passion Works addresses both UNSDG 8.5, productive and decent work for all, including those persons with disabilities, and 10.2, empowering economic inclusion of all, including those persons with disabilities. And finally, the case of Stirling Ultracold also addresses UNSDG 8.5, preserving the quality of jobs for persons in the rural area, an indicator that includes increasing the average wage for employees in economically distressed areas. All enterprises either had an explicit mission or impact data that could be aligned directly to these UNSDG targets. In each case, enterprises were able to achieve solutions to environmental, social, and economic issues through hyper-local engagement of community resources in the SEE. Other scholars of rural economies have noted similar positive linkages between strong community social capital and entrepreneurship [34,101].

3.2. University as Site of Social Capital Creation

As a systems approach, sustainable development necessitates community collaboration and democratic participation. The university, as convenor and intermediary, is a critical place for facilitating the collaborative process and making resources available—a role evident in all three cited case examples. In each, the university facilitated partnerships, connecting philanthropic opportunities and providing technical assistance and capacity building. The university as a site of ecosystem overlap serves a different function than extant literature on regional innovation hubs where the university serves as a knowledge or technology producer [73,102,103]. Finally, in alignment with the broader scholarly study of entrepreneurial learning and the role of universities [102,104] in the Appalachian Ohio ecosystem, the University has, for decades, hosted externally- and internally-funded entrepreneurial support programming, including its own innovation center, the Small Business Development Center, and several state and federally-funded programs serving entrepreneurial ideators.

Research shows rural Americans express trust regarding issues impacting sustainability when presented by local residents, especially those who work in fields where sustaining natural resources is imperative for community longevity, and the scientists from universities [26]. As our case studies also suggest, finding ways to facilitate direct interaction with university staff and faculty on community issues is a potential way to generate a vision for concrete action to support sustainable development issues [26].

3.3. Measuring Impact for Leveraging Outside Funding

Although not aligned with global reporting frameworks or planetary thresholds, the case studies here used impact measurements to attract diverse funders. For all three cases, the university provided measurement services both in economic development and measuring social value. Through the combined use of both measurement frameworks, enterprises are able to quantify positive spillover effects as a result of business activity in the SEE [97]. Although the opportunity still exists to align these local measurement tools to state or national frameworks, which would aggregate results to measure progress toward larger environmental and social goals [98], the university's role in providing measurement services for the SEE results is a critical advancement for enterprises [20,105,106].

3.4. Regional Champions Invested in the Long-Term

Our case studies confirmed the findings that document the sense of personal responsibility individuals in rural communities feel to not only protect the natural landscape but also to improve the social sphere of their communities [26,84]. Unlike other literature on innovative clusters [107], our case examples indicate that both the individual entrepreneurs and those key ecosystem partners who "wear many hats" [106] (p. 165) are people who move easily across sector boundaries to help facilitate the process of breaking down silos, a collaborative process that is beneficial to the entire SEE. These regional champions with

relationships across sectors in the ecotone also operate out of a sense of shared community responsibility and a desire for sustainable community development that extends beyond economic growth.

The case studies examined here confirmed the findings of other studies that underscore the role of social capital in economic transformation [107], but we extended this idea by acknowledging the historical economic transitions that contributed to the decline and later rebuilding of natural capital (Figure 1). Reflecting on a study of 20 heritage-led rural regeneration models, Egusquiza et al. [84] found that cultural, social, and natural capital were the most frequently occurring starting points of successful regeneration processes. The evolving conditions of each successive wave of economic development allowed for each of the SE cases examined in this study to emerge (Figure 1). Keeping with the theoretical framework of the SEE operating as an ecotone in fourth-wave economic development, our case examples mirrored the additional finding of Egusquiza et al. [84] that financial capital is an eventual success of rural sustainable innovations but "never a starting point" (p. 5069). The success of the enterprises seeking to act in a transformational capacity for community sustainability was significantly enhanced through multi-generational regional actors, often dedicated to social justice and environmental sustainability. These players leveraged social and political capital to create collective efficacy [30,34,70,71,73,78,108,109].

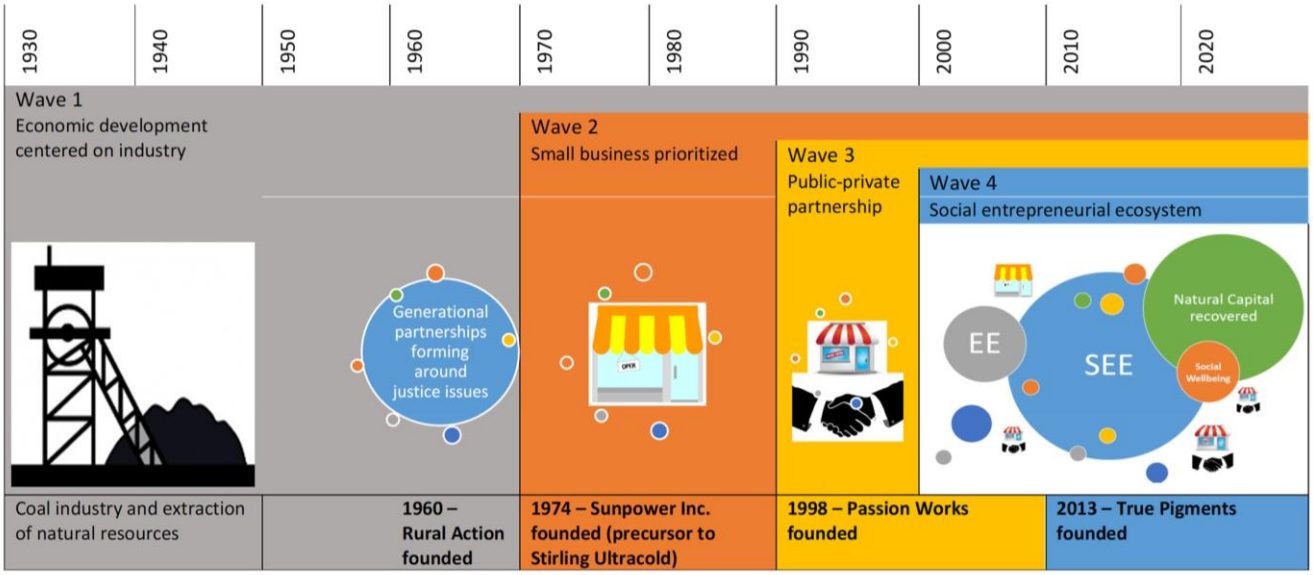


Figure 1. Timeline of economic development trends and the emergence of social enterprise cases examined in this study.

4. Discussion

The conversation around environmental sustainability and sustainable development has been criticized as "cockpit-ism: the illusion that top-down steering by governments and intergovernmental organizations alone can address global problems" [110] (p. 1652). Our findings illustrated that enterprise creation and success in the ecotone of the SEE centers on people and their relationship with their land and community as the primary driver of community regeneration and thriving.

While each enterprise ultimately collected impact metrics along the three dimensions of sustainability [21], reporting to a larger, global framework, while possible, was not a consideration. Responsibility to local community relationships was more clearly evident. These findings suggest that the orientation for the vision of fourth-wave economic development that includes sustainable development would be best served by taking into account multidimensional wealth building [40,51]. Our rural case examples revealed that sustainable entrepreneurship arises not from top-down policy but from individuals with

locally-driven place attachment, a desire to increase the quality of life in the community, and a stewardship ethos to reclaim and preserve natural assets for future generations.

As illustrated by the theoretical framework, a true, healthy ecosystem does not allow limitless, perpetual growth. The ecosystem of traditional EE has historically proved antithetical to other community capitals in many rural communities. Guided by an unbounded profit maximization problem, first-wave practices, and the traditional EE create negative externalities that damage natural capital and negatively impact residents' quality of life [97]. The framework wherein social and economic development occurs in the ecotone, encouraging the overlap and strengthening of relationships across community organizations and individuals in them, while also bounded by the natural ecosystem, provides a sustainable development framework that allows governing by endogenous forces to keep the system in balance.

The fourth wave of economic development as sustainable development in rural places through SEEs can be understood as occurring in the ecotone of two ecosystems, the EE, supporting economic development, and the social ecosystem supporting community development [65]. Within the ecotone, participation from diverse stakeholders creates the opportunity to recognize the "integral linkages between the environment, jobs, and social justice", where sustainable practices that enhance the ecological health of the community can be key to economic, amenity-based development and address the social impacts of industrialization and generational poverty [5] (p. 431). This sustainable rural prosperity framework not only emphasizes the richness of the ecotone as the creator of innovative clusters but also recognizes the planetary limits and relationship of the natural ecosystem to this development process.

Similar to other studies seeking to understand the forces that balance sustainability and development in rural development [5,26,63,84,111,112], our findings illustrate the need for encouraged support for conveners and policies that seek to strengthen collaborative relationships across sectors. The literature on SE continues to illustrate the importance of relationships in the ecotones: the dynamic process of SE creation and growth requires flexible, regional collaboration or "networks of support" energized by a collaborative vision of a thriving community future [20] (p. 18).

Where the academic literature has mostly been concerned with identifying and labeling the components and attributes of an SEE or EE, our findings point to the need for a larger, local framework that captures not only the SEs and the SEE that supports them but the larger community ecosystem seeking to create change [72,73]. Our case examples begin to show additional facets of the fourth wave of rural economic policy and theory. Fourth-wave economic development, in light of our exploration, places SEE in a position of strategic importance. From this point of view, a strong EE (constrained by requirements for natural resource protection and economic diversification), and a thriving public social system (including the natural ecosystem as an agential stakeholder), interact to create sustainable community development. In contrast to previous literature on SEE, our rural social enterprises provide evidence that, in practice, the typology for SEE typology is not clearcut.

Previous literature illustrates the importance of delineating between industry clusters of growth-oriented enterprises and what might comprise a "healthy entrepreneurial ecosystem" [97]. Through this differentiation, the core of sustainable development is acknowledged: a healthy ecosystem requires diversity and bounded growth in order to facilitate resilience, adaptation, and innovation in response to disruption and ultimate regenerative sustainability. The case examples highlighted how rural ecosystems in Appalachian Ohio have supported the emergence and growth of SEs focused on creating a thriving community system.

5. Conclusions

Entrepreneurs seeking to make a profit by fulfilling a sustainable mission in SEEs face barriers distinct from those faced by entrepreneurs in EEs. Many social entrepreneurs

with non-business backgrounds create start-ups, necessitating additional technical and operational support [97,105]. Additionally, successful SEs take a "bottom-up" approach which relies on community engagement and a significant volunteer base [111,113,114]. Additionally, the lack of flexible funding, despite the growth of impact investors, is a barrier to SE success.

While this case study illuminated several possible transferrable key factors for this context, the qualitative nature of the case studies resulted in a lack of generalizability. Further research, specifically comparative research, to understand the relevance of this framework for other rural regions is required. A further limitation of rural regions is a lack of mechanisms for understanding environmental impacts at the level of planetary limits. While localized information about the immediate effects of pollution on local ecosystems is easily collected and used for impact measurement (iron oxide leaking from abandoned mines, in the case of True Pigments), no mechanisms are in place in the current context to aggregate these measurements to the global level. Further research and methodologies are needed to understand the connection between local SEE impacts and larger global frameworks such as the UNSDGs and to make visible the tangible connections between SEE action and global environmental challenges such as climate change.

Local context influences the development of successful SEEs, and the factors relevant to the SEE studied here may differ from other locales. However, this paper provides a well-developed framework for application to other rural communities with nascent SEEs and emergent SEs. Further, it provides a building block in the continual development of social entrepreneurship and its linkages to more established adjacent fields, such as economic development.

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References

1. Catte, E. *What You Are Getting Wrong about Appalachia*; Belt Publishing: Cleveland, OH, USA, 2018.
2. O'Leary, S. *Appalachia's Natural Gas Counties: Contributing More to the U.S. Economy and Getting Less in Return*; Ohio River Valley Institute: Johnstown, PA, USA, 2021. Available online: https://ohiorivervalleyinstitute.org/wp-content/uploads/2021/02/Frackalachia-Report-update-2_12_01.pdf (accessed on 1 July 2023).
3. Learner, S. *Sacrifice Zones: The Front Lines of Toxic Chemical Exposure in the United States*; MIT Press: Cambridge, MA, USA, 2010.
4. Zipper, C.E.; Skousen, J. Coal's legacy in Appalachia: Lands, waters, and people. *Sci. Direct* **2021**, *8*, 100990. [CrossRef]
5. Green, G.P. Sustainability and Rural Communities. *Kans. J. Law Public Policy* **2014**, *23*, 421–436.
6. Jolley, G.J.; Khalaf, C.; Michaud, G.; Sandler, A.M. The economic, fiscal, and workforce impacts of coal-fired power plant closures in Appalachian Ohio. *Reg. Sci. Policy Pract.* **2018**, *11*, 403–422. [CrossRef]
7. Yahn, J. Fossil fuels and school funding: States, schools, and the oil and gas beneath the surface. In Proceedings of the American Edcuation Research Association Conference, San Diego, CA, USA, 25 April 2022.
8. Ohle, N.; Knapp, J. Building locally rooted wealth: Achieving results by leveraging community assets, leadership development and collaboration. In *Investing in Rural Prosperity*; Dumont, A., Davis, D.P., Eds.; Federal Reserve Bank of St. Lous & Board of Governors of the Federal Reserve System: St. Louis, MO, USA, 2021.
9. Eizenberg, E.; Jabareen, Y. Social Sustainability: A New Conceptual Framework. *Sustainability* **2017**, *9*, 68. [CrossRef]
10. Israel, G.D.; Beaulieu, L.J. Investing in communities: Social capital's role in keeping youth in school. *J. Community Dev. Soc.* **2004**, *34*, 35–57. [CrossRef]
11. Byun, S.; Meece, J.L.; Irvin, M.J.; Hutchins, B.C. The role of social capital in educational aspirations of rural youth. *PubMed Central.* **2012**, *77*, 355–379. [CrossRef]

12. Carr, P.J.; Kefalas, M.J. *Hollowing Out the Middle: The Rural Brain Drain and What It Means for America*; Beacon Press: Boston, MA, USA, 2009.
13. Sharp, E.H.; Seaman, J.; Tucker, C.J.; Van Gundy, K.T.; Rebellon, C.J. Adolescents future aspirations and expectations in the context of a shifting rural economy. *J. Youth Adolesc.* **2020**, *49*, 534–548. [CrossRef]
14. Pollard, K.; Jacobsen, L.A. *The Appalachian Region: A Data Overview from the 2012, 2016 American Community Survey Chartbook*; Appalachian Regional Commission: Washington, DC, USA, 2018.
15. Ghosh, S.; Cebula, R.J. Proximity to coal mines and mortality rates in the Appalachian Region of the United States: A spatial econometric analysis. *Reg. Stud. Reg. Sci.* **2021**, *8*, 130–142. [CrossRef]
16. Betz, M.R.; Mark, D.P.; Michael, F.; Lobao, L. Coal mining, economic development, and the natural resources curse. *Energy Econ.* **2015**, *50*, 105–116. [CrossRef]
17. Entre Works Consulting. *Entrepreneurial Ecosystems in Appalachia*; Appalachian Regional Commission: Washington, DC, USA, 2018.
18. Dumont, A.; Davis, D.P. (Eds.) *Investing in Rural Prosperity*; Federal Reserve Bank of St. Louis & Board of Governors of the Federal Reserve System: St. Louis, MO, USA, 2021.
19. Bornstein, D. *How to Change the World: Social Entrepreneurs and the Power of New Ideas*; Oxford University Press: Oxford, UK, 2007.
20. Kickul, J.; Lyons, T.S. *Understanding Social Entrepreneurship: The Relentless Pursuit of Mission in an Ever Changing World*; Routledge: New York, NY, USA, 2016.
21. Kuhlman, T.; Farrington, J. What is Sustainability? *Sustainability* **2010**, *2*, 3436–3448. [CrossRef]
22. Raworth, K. A Doughnut for the Anthropocene: Humanity's compass in the 21st Century. *Environ. Chang. Inst.* **2017**, *1*, e48–e49. [CrossRef] [PubMed]
23. Vogler, J. The international politics of sustainable development. In *Handbook of Sustainable Development*, 1st ed.; Atkinson, G., Dietz, S., Neumayer, E., Agarwala, M., Eds.; Edward Elgar Publishing: London, UK, 2014; pp. 432–445.
24. Burhans, M.; Houser, M.; Sandweiss, E.; Gazley, B.; Browning, E.G.; Reynolds, H.; Shanahan, J. *How Do Rural Hoosiers View Climate Change? Insights toward Engagement and Policy Design*; Hoosier Life Survey Rural Report; Environmental Resilience Institute, Indiana University: Bloomington, IN, USA, 2022.
25. Melotte, S. Research: Rural Climate Change Opinions Are More Complicated Than You Might Think. Daily Yonder. 2022. Available online: https://dailyyonder.com/research-rural-climate-change-opinions-are-more-complicated-than-you-might-think/2022/08/25/ (accessed on 20 April 2023).
26. Bonnie, R.; Diamond, E.P.; Rowe, E. *Understanding Rural Attitudes toward the Environment and Conservation in America*; Nicholas Institute for Environmental Policy Solutions, Duke University: Durham, UK, 2020.
27. Balmert, J. Gov. Mike Dewine Signs Bill Adding Local Input, Additional Hurdle for Wind and Solar Projects in Ohio. The Enquirer. 2021. Available online: https://www.jsonline.com/story/news/2021/07/12/dewine-signs-bill-adding-hurdle-wind-solar-projects-ohio/7943554002/ (accessed on 20 April 2023).
28. Zullo, R. Across the Country, a Big Backlash to New Renewables Is Mounting. Iowa Capital Dispatch. 2023. Available online: https://newhampshirebulletin.com/2023/02/20/across-the-country-a-big-backlash-to-new-renewables-is-mounting/ (accessed on 20 April 2023).
29. Gibson Kristin, E.; Lamm, A.J.; Lamm, K.W.; Warner, L.A. Communicating with Diverse Audiences about Sustainable Farming: Does Rurality Matter? *J. Agric. Educ.* **2020**, *61*, 156–174.
30. Holtkamp, C.; Weaver, R.C. Placing social capital: Place identity and economic conditions in Appalachia. *Southeast. Geogr.* **2018**, *50*, 58–79. [CrossRef]
31. Goetz, S.J.; Partridge, M.; Deller, S.C.; Fleming, D.A. Evaluating US rural entrepreneurship policy. *J. Reg. Anal. Policy* **2010**, *40*, 20–33.
32. Miles, M.P.; Morrison, M. An effectual leadership perspective for developing rural entrepreneurial ecosystems. *Small Bus. Econ. Entrep. J.* **2020**, *54*, 933–949. [CrossRef]
33. Korsgaard, S.; Müller, S.; Tanvig, H.W. Rural entrepreneurship or entrepreneurship in the rural–between place and space. *Int. J. Entrep. Behav. Res.* **2015**, *21*, 5–26. [CrossRef]
34. Flora, C.B.; Flora, J.L.; Gasteyer, S.P. *Rural Communities: Legacy + Change*, 5th ed.; Routledge Taylor & Francis: Florence, KY, USA, 2016.
35. Theobald, P. *Education Now: How Rethinking America's Past Can Change Its Future*; Routledge: London, UK, 2009.
36. Quinones, S. *Dreamland: The True Tales of America's Opiate Epidemic*; Bloomsbury: London, UK, 2015.
37. Boxall Peter, C.; Chan Wing, H.; McMillan Melville, L. The impact of oil and natural gas facilities on rural residential property values: A spatial hedonic analysis. *Resour. Energy Econ.* **2005**, *27*, 248–269. [CrossRef]
38. Ihlanfeldt Keith, R.; Taylor Laura, O. Externality effects of small-scale hazardous waste sites: Evidence from commercial property markets. *J. Environ. Econ. Manag.* **2004**, *47*, 117–139. [CrossRef]
39. Edelman, M. Hollowed out heartland, USA: How capital sacrificed communities and paved the way for authoritarian populism. *J. Rural. Stud.* **2021**, *82*, 505–517. [CrossRef]
40. Deller, S. Are we in the 4th wave of economic development? *Rev. Reg. Stud.* **2021**, *51*, 233–245. [CrossRef]
41. Shaffer, R.; Deller, S.; Marcouiller, D. *Community Economics: Linking Theory and Practice*, 2nd ed.; Blackwell: Oxford, UK, 2004.
42. Shaffer, R.; Deller, S.; Marcouiller, D. Rethinking community economic development. *Econ. Dev. Q.* **2006**, *20*, 59–74. [CrossRef]

43. Summers, G.F.; Branch, K. Economic Development and Community Social Change. *Annu. Rev. Sociol.* **1984**, *10*, 141–166. [CrossRef]
44. Phillips, R.; Pittman, R.H. A framework for community and economic development. In *An Introduction to Community Development*, 2nd ed.; Phillips, R., Pittman, R.H., Eds.; Routledge: London, UK, 2015; pp. 3–21.
45. Mandrysz, W. Community-based social economy: Social capital and civic participation in social entrepreneurship and community development. *Manag. Dyn. Knowl. Econ.* **2020**, *8*, 81–93.
46. Putnam, R.P. *Our Kids: The American Dream in Crisis*; Simon & Schuster: New York, NY, USA, 2015.
47. Conroy, T.; Deller, S.C. Where Do the Jobs Come From? Strategies for Job Creation; Patterns of Economic Growth and Development Policy Brief. 2015. Available online: https://economicdevelopment.extension.wisc.edu/files/2018/08/0302-WI-Econ-Job-Growth-Policy-Brief-1.pdf (accessed on 13 September 2022).
48. Stephens, H.M.; Partridge, M.D.; Faggian, A. Innovation, entrepreneurship and economic growth in lagging regions. *J. Reg. Sci.* **2013**, *53*, 778–812. [CrossRef]
49. Stephens, H.M.; Partridge, M.D. Do entrepreneurs enhance economic growth in lagging regions? *Growth Chang.* **2011**, *42*, 431–465. [CrossRef]
50. Markley, D.; Pages, E.; Dabson, B.; Johnson, T.; Lawrence, S.; Yanosy, S.; Dabson, K. *Creating an Entrepreneurial Appalachian Region: Findings and Lessons from an Evaluation of the Appalachian Regional Commission's Entrepreneurial Initiative 1997–2005*; RUPRI Center for Rural Entrepreneurship: Iowa City, IA, USA, 2008.
51. Volkmann, C.; Fichter, K.; Klofsten, M.; Audretsch, D.B. Sustainable entrepreneurial ecosystems: An emerging field of research. *Small Bus. Econ. Entrep. J.* **2021**, *56*, 1047–1055. [CrossRef]
52. Jolley, J.; Pittaway, L. Entrepreneurial ecosystems and public policy. *J. Entrep. Public Policy* **2019**, *8*, 293–296. [CrossRef]
53. Liedtke, M.; Asghari, R.; Spengler, T. Fostering entrepreneurial ecosystems and the choice of location for new companies in rural areas—The case of Germany. *J. Small Bus. Strategy* **2021**, *31*, 76–87. [CrossRef]
54. Müller, S.; Korsgaard, S. Resources and bridging: The role of spatial context in rural entrepreneurship. *Entrep. Reg. Dev.* **2018**, *30*, 224–255. [CrossRef]
55. Pato, M.L.; Teixeira, A. Twenty years of rural entrepreneurship: A bibliometric survey. *Sociol. Rural.* **2016**, *56*, 3–28. [CrossRef]
56. Morrison, E.; Barrett, J.D.; Fadden, J.B. Shoals Shift Project: An ecosystem transformation success story. *J. Entrep. Public Policy* **2019**, *8*, 339–358. [CrossRef]
57. Malizia, E.; Feser, E.; Renski, H.; Drucker, J. *Understanding Local Economic Development*, 2nd ed.; Routledge: New York, NY, USA, 2020.
58. Christoffersen, N.D.; Riley, B. Fostering Rural Prosperity through the Stewardship Economy. In *Investing in Rural Prosperity*; Dumont, A., Davis, D.P., Eds.; Federal Reserve Bank of St. Lous & Board of Governors of the Federal Reserve System: St. Lous, MO, USA, 2021.
59. Cafer, A.; Green, J.; Goreham, G. A community resilience framework for community development practitioners building equity and capacity. *Community Dev.* **2019**, *50*, 201–216. [CrossRef]
60. Jimenez, M.P.; DeVille, N.V.; Elliot, E.G.; Schiff, J.E.; Wilt, G.E.; Hart, J.E.; James, P. Associations between nature exposure and health: A review of the evidence. *Int. J. Environ. Res. Public Health* **2021**, *18*, 4790. [CrossRef]
61. McLaughlin, J.E.; Bush, A.A.; Friedman, A.D.; Lai, S.K. Immersive research experiences for high school students aimed at promoting diversity and visibility in pharmacy education. *Am. J. Pharm. Educ.* **2020**, *84*, 297–301. [CrossRef] [PubMed]
62. Winchester, B. Rewriting the Rural Narrative. Equity in Rural Life Ted-Talk Panel. National Forum to Advance Rural Education. 2021. Available online: https://www.ndsu.edu/fileadmin/challeyinstitute/Events/Rewriting_the_Rural_Narrative_by_Dr._Ben_Winchester.pdf (accessed on 20 April 2023).
63. Fleming, R.C. Creative Economic Development, Sustainability, and Exclusion in Rural Areas. *Geogr. Rev.* **2009**, *99*, 61–80. [CrossRef]
64. Cho, D.S.; Ryan, P.; Buciuni, G. Evolutionary entrepreneurial ecosystems: A research pathway. *Small Bus. Econ.* **2022**, *58*, 1865–1883. [CrossRef]
65. Ricket, A.L.; Knutsen, F.B.; Jolley, G.J.; Davis, S. Appalachian social entrepreneurship ecosystem: A framework for rural development. *Community Dev.* **2022**, *54*, 315–336. [CrossRef]
66. Barad, K. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*; Duke University Press: Duke, UK, 2007.
67. Northouse, P.G. *Leadership: Theory and Practice*, 9th ed.; Sage: Thousand Oaks, CA, USA, 2022.
68. Ferreira, L.M.R.; Esteves, L.S.; de Souza, E.; dos Santos, C.A.C. Impact of the urbanization process in the availability of ecosystem services in a tropical ecotone area. *Ecosystems* **2019**, *22*, 266–282. [CrossRef]
69. Hecht, M.; Crowley, K. Unpacking the learning ecosystems framework: Lessons from the adaptive management of biological ecosystems. *J. Learn. Sci.* **2019**, *29*, 264–284. [CrossRef]
70. Halstead, J.M.; Deller, S.C.; Leyden, K.M. Social capital and community development: Where do we go from here? *Community Dev.* **2022**, *53*, 92–108. [CrossRef]
71. O'Shea, G.; Farny, S.; Hakala, H. The buzz before business: A Design science study of a sustainable entrepreneurial ecosystem. *Small Bus. Econ.* **2021**, *56*, 1097–1120. [CrossRef]

72. Pankov, S.; Velamuri, V.K.; Schneckenberg, D. Towards sustainable entrepreneurial ecosystems: Examining the effect of contextual factors on sustainable entrepreneurial activities in the sharing economy. *Small Bus. Econ. Entrep. J.* **2021**, *56*, 1073–1095. [CrossRef]
73. Theodoraki, C.; Dana, L.P.; Caputo, A. Building sustainable entrepreneurial ecosystems: A holistic approach. *J. Bus. Res.* **2022**, *140*, 346–360. [CrossRef]
74. West, M. Human capital and workforce development. In *An Introduction to Community Development*, 2nd ed.; Routledge: London, UK, 2015; pp. 241–255.
75. Bloom, P.N.; Dees, J.G. Cultívate your Ecosystem. *Stanf. Soc. Innov. Rev.* **2008**, *6*, 46–53.
76. Hazenberg, R.; Bajwa-Patel, M.; Roy, M.J.; Mazzei, M.; Baglioni, S. A comparative overview of social enterprise 'ecosystems' in Scotland and England: An evolutionary perspective. *Int. Rev. Sociol.* **2016**, *26*, 205–222. [CrossRef]
77. Roy, M.J.; McHugh, N.; Huckfield, L.; Kay, A.; Donaldson, C. 'The most supportive environment in the world'? Tracing the development of an institutional "ecosystem" for social enterprise. *Volunt. Int. J. Volunt. Nonprofit Organ.* **2015**, *26*, 777–800. [CrossRef]
78. Thompson, T.A.; Purdy, J.M.; Ventresca, M.J. How entrepreneurial ecosystems take form: Evidence from social impact initiatives in Seattle. *Strateg. Entrep. J.* **2018**, *12*, 96–116. [CrossRef]
79. Binder, J.K.; Belz, F.M. Sustainable entrepreneurship: What it is. In *Handbook of Entrepreneurship and Sustainable Development Research*; Kyro, P., Ed.; Edward Elgar Publishing Inc.: Northampton, MA, USA, 2015; pp. 30–75.
80. Welter, F.; Baker, T.; Wirsching, K. Three waves and counting: The rising tide of contextualization in entrepreneurship research. *Small Bus. Econ.* **2019**, *52*, 319–330. [CrossRef]
81. ARC. *Appalachian Regional Commission Strategic Plan: Synthesis Report*; Appalachian Regional Commision & Mather & Mather: Washington, DC, USA, 2021.
82. Patton, M.Q. *Qualitative Research & Evaluation Methods*, 4th ed.; Sage: Newbury Park, CA, USA, 2015.
83. Yin, R.K. *Case Study Research: Design and Methods (Applied Social Research)*, 4th ed.; Sage: Newbury Park, CA, USA, 2008.
84. Egusquiza, A.; Zubiaga, M.; Gandini, A.; de Luca, C.; Tondelli, S.; Neuts, B.; Martins, J.; Šťastná, M.; Martin, J. Systemic innovation Areas for heritage-led rural regeneration: A multilevel repository of best practices. *Sustainability* **2021**, *13*, 5069. [CrossRef]
85. Miles, M.B.; Huberman, A.M.; Saldana, J. *Qualitative Data Analysis*, 4th ed.; Sage: Los Angeles, CA, USA, 2020.
86. Weiss, R.S. *Learning from Strangers: The Art and Method of Qualitative Interview Studies*; The Free Press: New York, NY, USA, 1994.
87. Glesne, C. *Becoming Qualitative Researchers: An Introduction 2016*, 5th ed.; Pearson: Madrid, Spain, 2016.
88. Jolley, G.J.; Uzuegbunam, I.; Glazer, J. TechGROWTH Ohio: Public venture capital and rural entrepreneurship. *J. Reg. Anal. Policy* **2018**, *48*, 3773.
89. Ross, M.L. What have we learned about the resource curse? *Annu. Rev. Political Sci.* **2015**, *18*, 239–259. [CrossRef]
90. Partridge, M.D.; Betz, M.R.; Lobao, L. Natural resource curse and poverty in Appalachian America. *Am. J. Agric. Econ.* **2013**, *95*, 449–456. [CrossRef]
91. Jolley, G.J.; Khalaf, C.; Michaud, G.L.; Belleville, D. The economic contribution of logging, forestry, pulp & paper mills, and paper products: A 50-state analysis. *For. Policy Econ.* **2020**, *115*, 102140.
92. Michaud, G.; Jolley, G.J. Economic contribution of Ohio's wood industry cluster: Identifying opportunities in the Appalachian region. *Rev. Reg. Stud.* **2019**, *49*, 149–171. [CrossRef]
93. Weber, J.G. A decade of natural gas development: The makings of a resource curse? *Resour. Energy Econ.* **2014**, *37*, 168–183. [CrossRef]
94. Douglas, S.; Walker, A. Coal mining and the resource curse in the eastern United States. *J. Reg. Sci.* **2017**, *57*, 568–590. [CrossRef]
95. Dilawar, A. An Ohio Artist and Activist is Turning Acid Mine Pollution into Paint. Time. 2020. Available online: https://www.ohio.edu/sustainability/ohio-artist-and-activist-turning-acid-mine-pollution-paint (accessed on 1 January 2023).
96. About Us. Rural Action 2022. Available online: https://ruralaction.org/get-to-know-us/about-us/ (accessed on 1 January 2023).
97. Roundy, P. Social entrepreneurship and entrepreneurial ecosystems: Complementary or disjointed phenomena? *Int. J. Soc. Econ.* **2017**, *44*, 1252–1267. [CrossRef]
98. Acosta, F. Linking Neveda to Donut Economics. *Sustainability* **2022**, *14*, 15294. [CrossRef]
99. Mohammadi, N.; Heshmati, S. Entrepreneurial opportunity recognition: A bibliometric overview and clustering analysis. *World J. Sci. Technol. Sustain. Dev.* **2021**, *18*, 239–258. [CrossRef]
100. Global Indicator Framework for the Sustainable Development Goals and Targets of the 2030 Agenda for Sustainable Development. Available online: https://unstats.un.org/sdgs/indicators/Global%20Indicator%20Framework%20after%202023%20refinement_Eng.pdf (accessed on 1 January 2023).
101. Roxas, H.B.; Azmat, F. Community social capital and entrepreneurship: Analyzing the links. *Community Dev.* **2014**, *45*, 135–150. [CrossRef]
102. Lyons, T.S.; Lyons, J.S.; Jolley, G.J. Entrepreneurial skill-building in rural ecosystems: A framework for applying the Readiness Inventory for Successful Entrepreneurship (RISE). *J. Entrep. Public Policy* **2020**, *9*, 112–136. [CrossRef]
103. Acs, Z.J.; Stam, E.; Audretsch, D.B.; O'Connor, A. The lineages of the entrepreneurial ecosystem approach. *Small Bus. Econ.* **2017**, *49*, 1–10. [CrossRef]
104. Lyons, T.S.; Lyons, J.S.; Jolley, J. The readiness inventory for successful entrepreneurship (RISE): A tool for university engagement in entrepreneurial learning. *Econ. Dev. High. Educ.* **2019**, *2*, 1.

105. Nicholls, J.; Lawlor, E.; Neitzert, E.; Goodspeed, T. *A Guide to Social Return on Investment*; The SROI Network. 2012. Available online: https://www.socialvalueint.org/guide-to-sroi (accessed on 1 September 2022).
106. Nicholls, J.; Zochowski, T. Mutually Compatible, yet Different: A Theoretical Framework for Reconciling Different Impact Monetization Methodologies and Frameworks. 2020. Available online: https://ssrn.com/abstract=3715451 (accessed on 1 January 2023).
107. Feldman, M.P. The character of innovative places: Entrepreneurial strategy, economic development, and prosperity. *Small Bus. Econ.* **2014**, *43*, 9–20. [CrossRef]
108. Corbett, M. Rural schools and communities: We can bridge, but can we bond? In *The Bloomsbury Handbook of Rural Education in the United States*; Azano, A.P., Eppley, K., Biddle, C., Eds.; Sage Publications Inc.: Los Angeles, CA, USA, 2021; pp. 165–172.
109. Gyimah, P.; Lussier, R.N. Rural entrepreneurship success factors: An empirical investigation in an emerging market. *J. Small Bus. Strategy* **2021**, *31*, 5–19. [CrossRef]
110. Hajer, M.; Nilsson, M.; Raworth, K.; Bakker, P.; Berkhout, F.; Boer, Y.; Rockström, J.; Ludwig, K.; Kok, M. Beyond Cockpit-Ism: Four Insights to Enhance the Transformative Potential of the Sustainable Development Goals. *Sustainability* **2015**, *7*, 1651–1660. [CrossRef]
111. Gonzalez, A.D.; Dentchev, N.A. Ecosystems in support of social entrepreneurs: A literature review. *Soc. Enterp. J.* **2021**, *17*, 329–360. [CrossRef]
112. Sottosanti, K.; Gibson, A. Grown Your Own: How Southeast Ohio is becoming a hotspot for technology commercialization and entrepreneurs. *Ohio University Perspectives* **2012**, *16*, 28–35.
113. Borzaga, C.; Fazzi, L.; Galera, G. Social enterprise as a bottom-up dynamic: Part 1. The reaction of civil society to unmet social needs in Italy, Sweden and Japan. *Int. Rev. Sociol.* **2016**, *26*, 1–18. [CrossRef]
114. Borzaga, C.; Fazzi, L.; Galera, G. Social enterprise as a bottom-up dynamic. Part 2, the reaction of civil society to unmet social needs in England, Scotland, Ireland, France and Romania. *Int. Rev. Sociol.* **2016**, *26*, 201–204. [CrossRef]