

Digital Resilience and Sustainable Opportunity Recognition Among Small Entrepreneurs in Post-COVID Local Markets

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Abstract: *The COVID-19 crisis forced small firms worldwide to rethink how they identify and exploit entrepreneurial opportunities while coping with unprecedented uncertainty. This paper examines how small sustainable entrepreneurs in local food, retail, and service sectors build digital resilience and use their prior knowledge, motivations, and values to recognize sustainability-oriented opportunities in a post-pandemic context. Drawing on semi-structured interviews with twelve owner-managers operating environmentally and socially responsible ventures, the study explores how internal factors (knowledge of ecological issues, personal experience, and prosocial motives) interact with external triggers (health restrictions, digital platforms, and local support schemes) to shape opportunity recognition and adaptation strategies. Thematic analysis reveals three main patterns: digitalization as a central resilience capability, sustainability values as a lens for opportunity identification, and agile reconfiguration of business models in response to shocks. The paper contributes to sustainable entrepreneurship literature by highlighting how digital resilience capabilities reinforce the recognition and exploitation of sustainability-oriented opportunities during systemic disruptions. Practical implications are offered for entrepreneurs, educators, and policymakers seeking to support resilient and sustainable small business ecosystems*

Keywords: Sustainable entrepreneurship, Digital Resilience, COVID-19 impact, entrepreneurs.

I. INTRODUCTION

In recent years, entrepreneurs have been urged to address environmental degradation, social inequality, and resource scarcity while still remaining economically viable. The COVID-19 pandemic intensified this pressure by disrupting supply chains, restricting mobility, and accelerating the diffusion of digital technologies across sectors. These developments have created both new constraints and new avenues for sustainable entrepreneurship, particularly in small and medium enterprises (SMEs) that tend to be more vulnerable to economic shocks yet closely embedded in local communities.

Sustainable entrepreneurship refers to the creation and development of ventures that pursue environmental and social goals alongside economic outcomes, aiming to preserve natural and social systems for current and future generations (Muñoz & Cohen, 2018; Shepherd & Patzelt, 2011). A central question in this field concerns how entrepreneurs recognize and act on opportunities that generate sustainability benefits, especially under conditions of high uncertainty and change (Cohen & Winn, 2007; Patzelt & Shepherd, 2011). The pandemic offers a unique context to explore this question because it combined a health crisis, an economic downturn, and a rapid shift toward digital work and consumption.

This paper investigates how small sustainable entrepreneurs perceive and respond to sustainability-oriented opportunities in a post-COVID environment and how their digital capabilities support resilience and opportunity exploitation. Building on qualitative data from twelve small ventures operating in sectors such as food, clothing, health and wellness, construction services, and digital services, the study asks:

- How do small sustainable entrepreneurs recognize opportunities during and after the COVID-19 crisis?
- What role do knowledge, motivation, and values play in this opportunity recognition process?
- How do digital tools and platforms support resilience and the pursuit of sustainable opportunities?

By addressing these questions, the paper contributes to the growing literature on sustainable entrepreneurship and digital resilience, and offers practice-oriented insights for small business owners seeking to align sustainability ambitions with survival in turbulent times.

II. LITERATURE REVIEW

2.1 Sustainable entrepreneurship and opportunity recognition

Entrepreneurship research traditionally conceptualized opportunities as situations where new products, services, or organizational arrangements can be introduced to create economic value (Eckhardt & Shane, 2003; Shane, 2000). Sustainable entrepreneurship broadens this view by emphasizing opportunities that also preserve ecosystems, support communities, and deliver non-economic value (Cohen & Winn, 2007; Shepherd & Patzelt, 2011). Sustainable entrepreneurial opportunities often emerge from environmental and social problems such as pollution, resource scarcity, or social exclusion, which create unmet needs and “institutional voids” that entrepreneurs can address with innovative solutions (Dean & McMullen, 2007; Terán-Yépez et al., 2020).

The ability to notice such opportunities is shaped by entrepreneurs’ prior knowledge, experience, and cognitive frames (Shane & Venkataraman, 2000; Ardichvili et al., 2003). In sustainable entrepreneurship, knowledge of ecological systems, social issues, and stakeholder expectations appears particularly important in recognizing where economic activity can also contribute to environmental or social improvements (Patzelt & Shepherd, 2011; Ploum et al., 2018). Empirical studies have shown that values related to pro-environmental behavior and moral concern for others can enhance the recognition of sustainability-oriented opportunities (Choongo et al., 2016; Ploum et al., 2018).

2.2 Internal drivers: knowledge, motivation, and values

Internal factors such as prior knowledge, work experience, and personal motivation are central antecedents of opportunity recognition. Prior industry or functional experience provides entrepreneurs with idiosyncratic information and skills that others do not have, making them better positioned to identify market gaps and feasible solutions (Davidsson & Honig, 2003; Shane, 2008). Sustainable entrepreneurs often combine technical knowledge with an understanding of environmental problems or social needs, which allows them to envision business models that reduce negative externalities or create positive impacts (Hanohov & Baldacchino, 2018).

Motivation can be driven by perceived threats to one’s own well-being or by empathy and altruism toward others and the natural environment. For example, concerns about health risks, climate-related disasters, or unfair working conditions can trigger entrepreneurial efforts to provide cleaner technologies, healthier products, or fairer employment practices (Khan & Quaddus, 2015; Muñoz & Dimov, 2017). These prosocial and pro-environmental motives influence which problems entrepreneurs attend to and how they interpret potential solutions (Lefevor et al., 2017; Urbaniec, 2018).

2.3 Resilience and digitalization in small firms

Resilience describes the capacity of individuals and organizations to maintain functioning, adapt, and recover in the face of shocks, disruptions, or prolonged stress (Bullough et al., 2014; Gittel et al., 2006). For small businesses, resilience depends on cognitive, behavioral, and relational capabilities that support flexible responses, resource reallocation, and learning from adversity (Manfield & Newey, 2018; Prasad et al., 2015). The COVID-19 pandemic has illustrated how quickly market conditions can shift, highlighting the importance of agility, experimentation, and rapid reconfiguration of business models (Kaplan et al., 2020; Suarez & Montes, 2020).

Digital technologies play a growing role in enabling small firm resilience. Online platforms, e-commerce tools, videoconferencing, and social media allow entrepreneurs to reach customers, coordinate with partners, and deliver services even when physical interactions are constrained. Evidence from the pandemic suggests that small firms with stronger digital capabilities were better able to continue operations, pivot offerings, and access support programs during lockdowns (Dietrich et al., 2020; Lee, 2020). In sustainable entrepreneurship, digital tools can also support transparency, stakeholder engagement, and efficient resource use, reinforcing both resilience and sustainability outcomes.

Despite these insights, relatively few studies have examined how sustainable entrepreneurs combine internal drivers (knowledge, motivation, values) with digital capabilities to recognize and exploit sustainability-oriented opportunities during systemic disruptions. This study addresses that gap.

III. METHODOLOGY

3.1 Research design

Given the exploratory nature of the research questions and the focus on subjective interpretations and processes, a qualitative research design was adopted. Semi-structured interviews were used to capture entrepreneurs' experiences of recognizing and acting on sustainability-oriented opportunities during and after the COVID-19 crisis. This approach is appropriate for understanding how individuals construct meaning around environmental and social issues, and how they describe their adaptation strategies in their own words (Braun & Clarke, 2006; Hammersley & Atkinson, 2007).

3.2 Sample and context

The study focuses on twelve small ventures operating in local markets characterized by strong environmental and social concerns, as well as intense pandemic-related disruptions. The businesses employ fewer than fifty people and operate in sectors including sustainable food and beverages, ethical clothing, eco-friendly products, health and wellness, construction clean-up services, and digital or paperless services. All ventures fit a working definition of sustainable entrepreneurship: their products or services reduce environmental harm, enhance social well-being, or both, while remaining financially viable.

Participants were selected through purposive sampling to ensure that they met three criteria: at least ten years of work experience, a minimum of two years of business operation, and an explicit commitment to environmental and/or social goals in their business models. Entrepreneurs were identified through personal networks, sustainability-oriented business hubs, and online directories. This strategy yielded a diverse set of cases with different backgrounds but a shared orientation toward sustainability.

3.3 Data collection

Data were collected in two waves. The first wave involved in-person semi-structured interviews conducted before or in the early stages of the pandemic, focusing on the origins of the ventures, entrepreneurs' knowledge and values, and their sustainability practices. The second wave, conducted via videoconferencing and telephone after the onset of COVID-19, explored how entrepreneurs experienced the crisis, which opportunities they observed, how they adapted their operations, and how digital tools contributed to resilience.

Interviews typically lasted between 30 and 45 minutes and followed an interview guide that allowed for open-ended discussion while ensuring coverage of key topics such as opportunity recognition, motivation, digitalization, and adaptation strategies. With participants' consent, notes were taken and information was complemented with publicly available materials such as websites and social media pages to better understand each venture's sustainability positioning and digital presence.

3.4 Data analysis

Data were analyzed using thematic analysis, following the six-step process proposed by Braun and Clarke (2006): familiarization with the data, initial coding, theme development, theme review, theme definition, and reporting. Initial coding focused on segments related to opportunity recognition, sustainability motivations, knowledge sources, resilience behaviors, and use of digital tools. Codes were iteratively grouped into broader themes that captured recurring patterns across cases, such as "sustainability as opportunity lens," "digital channels as lifeline," and "agile reconfiguration of offerings".

To protect confidentiality, each entrepreneur was assigned an alphabetical code and descriptive information was anonymized. Cross-case comparisons were used to identify similarities and differences across sectors and personal backgrounds.

IV. FINDINGS

4.1 Sustainability as a lens for opportunity recognition

Across the twelve cases, entrepreneurs described sustainability not as a separate add-on, but as a lens through which they evaluate potential opportunities in their environment. Many participants reported that they first became aware of unsustainable practices—such as food waste, disposable packaging, inefficient energy use, or unsafe working conditions—and then started to imagine business models that could address these issues.

For instance, several entrepreneurs in the food and agriculture space saw large quantities of unused produce and considered it both an environmental problem and a business opportunity to upcycle or process surplus products into juices, preserves, or specialty items. Others in clothing and textiles focused on fabric waste and harmful production practices, leading them to develop recycled or ethically produced clothing lines. These opportunity perceptions were grounded in the entrepreneurs' prior experience in the respective industries, as well as their awareness of environmental and social impacts (Shane, 2008; Urbaniec, 2018).

Knowledge about ecological and social issues was acquired through different channels: formal education, previous employment, family businesses, or life experiences such as migration and exposure to different cultures. The entrepreneurs used this knowledge to identify where existing practices could be changed to reduce negative externalities or create additional value for stakeholders (Patzelt & Shepherd, 2011). This supports the idea that sustainable opportunity recognition depends on a combination of domain-specific and sustainability-related knowledge.

4.2 Motivational drivers: perceived threats and altruism

Motivational narratives combined self-oriented concerns with empathy toward others and the environment. Some entrepreneurs emphasized a personal sense of threat, noting that environmental degradation, health problems, or poor product quality had directly affected them or their families and pushed them to search for alternative solutions. For example, health-oriented entrepreneurs described how dissatisfaction with conventional medicine led them to explore plant-based remedies and later to create ventures around herbal products.

At the same time, many participants highlighted altruistic motives, such as wanting to support local farmers, preserve cultural traditions, improve workers' conditions, or reduce the burden of waste on future generations (Khan & Quaddus, 2015; Muñoz & Dimov, 2017). These prosocial motives influenced not only the choice of business idea but also ongoing decisions about suppliers, pricing, and employment practices. In several cases, entrepreneurs deliberately accepted lower short-term profits to maintain ethical sourcing, fair wages, or environmentally friendly materials, suggesting that moral and identity-related goals are integrated into their opportunity assessments (Lefevor et al., 2017; Ploum et al., 2018).

4.3 Digital resilience during and after COVID-19

The onset of COVID-19 fundamentally altered the conditions under which these small ventures operated, but it also revealed their capacity for digital resilience. When lockdowns and social distancing measures restricted physical interactions, entrepreneurs rapidly expanded or initiated their online presence through websites, e-commerce platforms, social media shops, and videoconferencing tools. Some converted in-person workshops and demonstrations into virtual events, while others began accepting online orders and offering home delivery or contactless pick-up services.

Interviewees stressed that digital channels enabled them to maintain relationships with customers and suppliers, communicate safety measures, and test new products despite physical restrictions. Tools such as Zoom, online payment systems, and social media campaigns became essential for day-to-day operations. Not all businesses were equally prepared: those with stronger pre-existing digital skills or platforms adapted more quickly, while others faced steep learning curves and technical challenges. However, across the sample, there was a clear recognition that digital capabilities had become a core component of resilience and a prerequisite for future competitiveness.

4.4 Agile reconfiguration of business models

Beyond simple channel shifts, many entrepreneurs reconfigured their offerings, cost structures, and partnerships to respond to changing conditions. For example, some diversified product lines by introducing new items that fitted pandemic-related needs, such as home-friendly wellness products, local food boxes, or sustainable gift items suitable for

online gifting. Others adjusted their sourcing strategies to rely more heavily on local suppliers, reducing logistical risks while reinforcing sustainability narratives and community ties.

Entrepreneurs also reallocated resources, including reassigning staff to digital marketing or online customer service and exploring collaborations with complementary small businesses. These agile responses reflect a combination of resilience capabilities—such as willingness to experiment, openness to learning, and rapid decision-making—and sustainability-driven logics that emphasize long-term stakeholder relationships and community support (Manfield & Newey, 2018; Suarez & Montes, 2020).

Interestingly, the crisis also amplified consumers' interest in local and sustainable products, which several participants perceived as an opportunity to deepen their market presence and educate customers about environmental and social issues. This suggests that shocks can open windows where sustainability narratives gain traction, reinforcing opportunity recognition for sustainable entrepreneurs.

V. DISCUSSION

The findings suggest that digital resilience, sustainability values, and prior knowledge are mutually reinforcing components of sustainable opportunity recognition in turbulent environments. Entrepreneurs used their understanding of ecological and social challenges to spot possibilities for new or improved offerings, while digital tools enabled them to act on these insights despite physical constraints. Motivations rooted in both self-protection and altruism provided the emotional energy to persist and adapt under stress (Bullough et al., 2014).

This study extends sustainable entrepreneurship research by highlighting the role of digitalization as not merely an operational tool but as a strategic enabler of sustainability-oriented opportunities during systemic crises (Cohen & Winn, 2007; Hanohov & Baldacchino, 2018). While prior work has emphasized internal factors such as knowledge, values, and moral competencies (Patzelt & Shepherd, 2011; Ploum et al., 2018), the present findings show that these factors must be complemented by digital capabilities that allow entrepreneurs to reach stakeholders, reconfigure models, and maintain continuity in volatile contexts.

Furthermore, the results illustrate that small sustainable ventures can act as local change agents by demonstrating how environmental and social concerns can be integrated into everyday business decisions, even under financial and operational pressure (Terán-Yépez et al., 2020; Urbaniec, 2018). The crisis accentuated the visibility of such initiatives, as consumers and communities became more aware of the importance of resilient, locally embedded, and sustainability-oriented businesses.

VI. IMPLICATIONS

6.1 Implications for entrepreneurs

For practitioners, the study underscores the importance of developing a balanced portfolio of capabilities that combine sustainability-related knowledge, prosocial motivation, and digital skills. Entrepreneurs can strengthen opportunity recognition by actively learning about environmental and social issues in their sectors, building relationships with stakeholders affected by these issues, and reflecting on their own values and long-term aspirations. At the same time, investing in basic digital infrastructure—such as user-friendly websites, online payment systems, and simple analytics—can significantly increase the ability to respond to disruptions and explore new opportunities.

Cultivating an agile mindset, characterized by openness to experimentation, rapid feedback cycles, and willingness to pivot, is particularly valuable in contexts where external shocks and policy changes are frequent (Suarez & Montes, 2020). Small ventures can start with low-risk digital experiments, such as online pilot campaigns or limited-scope collaborations, to learn what works without overcommitting resources.

6.2 Implications for policymakers and support organizations

Policymakers and business support organizations can play a critical role in enabling sustainable and resilient small business ecosystems. Targeted training and mentoring programs that combine sustainability literacy with practical digital skills would help entrepreneurs to identify and act on sustainability-oriented opportunities more effectively. Accessible

financial assistance, technical support, and advisory services during crises can reduce the risk of permanent closures, especially among early-stage ventures.

Public agencies and local chambers of commerce can also support platforms that connect sustainable entrepreneurs with consumers, suppliers, and investors, reinforcing networks that facilitate knowledge exchange and collaborative innovation (Spigel & Harrison, 2018). Integrating sustainability criteria into public procurement and recovery programs can further incentivize small firms to adopt environmentally and socially responsible practices.

6.3 Implications for education and research

For educators, the findings suggest the value of experiential learning formats that expose students to real sustainable ventures, digital tools, and crisis scenarios. Case-based teaching, live projects with local SMEs, and interdisciplinary courses that connect entrepreneurship, sustainability, and digital transformation can better prepare future entrepreneurs for complex environments.

Further research could explore variations across regions, industries, and types of digital technology, as well as the long-term outcomes of sustainability-oriented digital pivots introduced during the pandemic. Comparative studies between sustainable and conventional ventures could clarify whether digital resilience capabilities develop differently when sustainability is a core part of the business logic.

VII. CONCLUSION

This paper explored how small sustainable entrepreneurs recognize and exploit opportunities in the context of the COVID-19 crisis, emphasizing the interplay between internal drivers and digital resilience. The findings indicate that prior knowledge of environmental and social issues, prosocial motivations, and values-based commitments guide opportunity recognition, while digital tools and agile practices enable entrepreneurs to adapt their business models and continue delivering sustainability benefits under disruption.

By demonstrating how sustainability and resilience can reinforce one another, the study provides a nuanced picture of sustainable entrepreneurship in times of crisis and offers practical guidance for entrepreneurs, policymakers, and educators seeking to support robust, sustainability-oriented local economies.

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