Small Holds Sway:

How Small Businesses Mobilize Knowledge to Support Action in Learning Processes for Sustainability Transformations

by

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Author's Declaration

This thesis consists of material, all of which I authored or co-authored: see Statement of Contributions included in the thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Statement of Contributions

Christopher Luederitz was the sole author of Chapters 1, 2, and 6, which were not written for publication. This thesis consists in part of three manuscripts written for publication. The dissertation has been reviewed and edited in its entirety by supervisor Dr. Sarah Burch and committee members Dr. Tara Vinodrai, Dr. Barry Colbert, and Dr. Dr. Guido Caniglia. Exceptions to sole authorship of material are as follows:

Research presented in Chapters 4:

This chapter builds on a co-authored article that was prepared for publication. This research was conducted at the University of Waterloo by Christopher Luederitz, which involved the conceptualization, study design and investigation, data analysis and curation, funding acquisition and administration, and writing and editing of the draft manuscript. Supervisor Dr. Sarah Burch and committee member Dr. Dr. Guido Caniglia provided ongoing support, intellectual input, editorial advice, and guidance.

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As lead author of all chapters, Christopher Luederitz was solely responsible for conceptualizing study design, carrying out data collection and analysis, and drafting and submitting manuscripts. All co-authors provided guidance on each step of the research and feedback on draft manuscripts.

Abstract

Transformations of the industrialized food sector toward more sustainable food production, manufacturing, and consumption take place through individual and collective learning processes. Achieving transformational change requires intra- and inter-organizational learning to embed alternative principles in business operation, foster new social arrangements, and develop creative strategies in support of sustainable food practices. Research has made much progress in conceptualizing transformation processes of the food sector – addressing definitional 'what' questions. Also, scholars have conducted thorough analyses of the underlying motivations that support businesses in pursuing organizational sustainability – addressing motivational 'why' questions. Yet, empirical research examining how businesses engage in learning processes that can lead to broader transformational change is still missing – that is, the research on the role of businesses in the food sector has not engaged with 'how' questions.

This thesis responds to this gap by building on a dynamic conception of learning to empirically explore the relationship between transformations of the food sector and the contextual meaning-making, knowledge mobilizing, and procedural action through which businesses realize change for sustainability. More specifically, this thesis draws attention to the role that different forms of knowledge assume in supporting intra- and inter-organizational learning processes that allow businesses to purposefully take action for sustainability in complex situations. For the empirical research, I employ a mixed-methods approach (including semi-structured interviews, participant observations, analytic autoethnography, and document analysis) to examine how learning supports craft breweries – small, independently owned businesses that are inspired by non-industrial production methods – to collectively advance system change. I present the conducted research in three articles detailing how small businesses engage in and bring about transformational change for sustainability. While written as independent articles, they comprise a whole, as collectively, this work offers insights into how small businesses draw on knowledge as a resource to support action for sustainability.

The first manuscript empirically demonstrates the importance of alternative narratives for learning as they enable small businesses to construct storylines of how they engage in sectoral transformations. I explore how craft breweries draw on alternative principles and actions to guide the construction of narratives that verbalize a new future into existence beyond industrialized and competitive markets.

This research offers a nuanced understanding of the collective ability of small businesses to discursively construct new meanings and new stories that illustrate the need for and existence of alternative social arrangements to support sustainability transformations.

The second manuscript elucidates how craft breweries that work in a concentrated and internationally connected industry, mobilize knowledge in support of collective action to construct sustainability niches in an otherwise hostile environment. The findings demonstrate how learning is supported by the translation between tacit and explicit forms of knowledge, so-called knowledge conversion. The research shows how small businesses challenge the conventional industry logics and practices by mobilizing knowledge conversion in support of sustainability experimentation. I offer a comprehensive conceptual framework and detailed empirical examination of how small businesses respond to and transform the context in which they operate, collectively formulate goals for directing change, and bring tangible assets into service of experimentation to realize emergent possibilities.

The third manuscript systematically explores the learning processes through which entrepreneurs develop sustainability strategies while navigating the tensions and challenges involved in realizing sustainability within the host context. Building on conceptualizations of entrepreneurship as an evolutionary process, I empirically explore the learning process of two small businesses in the brewing industry. This research details how small businesses create and mobilize knowledge to intentionally design organizational change, develop shared agency for the support of appropriate interventions, and leverage context-specific resources for acting appropriately in complex situations. Moreover, I offer insights into how small businesses can engage leverage entrepreneurial actions to support learning processes for sustainability strategies.

This thesis emphasizes the ability of small businesses as meaning-makers and proposes a dynamic approach for understanding the role of knowledge and action in transformations for sustainability. I offer empirical evidence of the learning processes through which businesses generate meaningful action for contextually realizing change, and reflexively and deliberately (re)align their actor roles with the so created alternative social arrangements. Knowledge plays a crucial role in this process as it supports small businesses to creatively and cooperatively shape future goals and direct change. Overall, this work can help to support small businesses in coordinating concerted efforts to create viable enterprises from bringing about change for sustainability. It draws attention to the agency of small businesses in crafting new narratives, alternative social arrangements, and sustainability strategies that help support transformations of the industrialized food sector.

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Chapter 1
Introduction

Individual and collective learning processes are central to transforming the industrialized food sector toward more sustainable food production, manufacturing, and consumption. The unsustainability that characterizes the industrialized food sector from production to consumption has brought together a broad variety of actors to advocate for its fundamental transformation (Oliver et al., 2018; Willett et al., 2019). This malfunctioning system severely degrades environmental and human health, exacerbates social injustice across regions, and simultaneously undermines the integrity of the ecosystems and societies upon which it ultimately depends (Laestadius & Wolfson, 2019; Rotz & Fraser, 2015). Ironically, food industries – spanning from fertilizer to meat and grain packaging, food and beverage processing as well as retail, along with the few transnational corporations that dominate them – are highly profitable (Clapp, 2018; Howard, 2016). The industrialized food sector has deep historical roots and its success is embedded and enabled by a complex web of practices, regulations, social arrangements, and belief systems (Friedmann & McMichael, 1989; McMichael, 2009; Vivero-Pol, 2017). Scholars have argued that initiating fundamental change in this context, requires individual and collective learning for actors to imagine alternative futures, engage with changed practices, take up different attitudes, and develop new ways of thinking to address the underlying roots of unsustainability (De Bernardi, Bertello, Venuti, & Zardini, 2019; Kurucz, Colbert, Lüdeke-Freund, Upward, & Willard, 2017; Marsden & Smith, 2005).

In this context, small businesses have gained increased attention as important actors capable of transforming the food sector toward sustainability because they can contribute to diverse change processes, increase the autonomy of decision-making, and pioneer new initiatives in local places (Donald, 2008; Dubbeling, Carey, & Hochberg, 2016; Schumacher, 1973). In particular, businesses that are small in size, owner-operated, and locally-oriented can collectively influence sustainability transformations (Blay-Palmer & Donald, 2009; Gomez, Isakov, & Semansky, 2015; Jennings, Cottee, Curtis, & Miller, 2015). Yet, the majority of research on business sustainability is focused on "definitional ('what') and motivational ('why') questions" and does not address the "core problem [of] *how* to change a firm's operations, goals and overall business model" in a way that purposefully supports transformations toward sustainability (Zollo, Cennamo, & Neumann, 2013, pp. 242, 253). The focus on 'how' brings attention to the role of knowledge in supporting businesses to collectively

work toward social, environmental, and economic goals within local places (Kensbock, Hales, Hornby, Cater, & Jennings, 2015; Ryle, 2009; Wiklund & Shepherd, 2003). Sustainability, in this context, offers a procedural frame to bring potentially conflicting notions of ecological and social aspects, and protection and development together to address normative considerations of justice, equity and inclusivity in context (Ansell, 2011; Gibson, 2006; Hahn, Figge, Pinkse, & Preuss, 2018). Individual and collective learning processes are therefore needed if enterprises are to significantly contribute to transforming the industrialized food sector toward sustainability; these processes need to support businesses to act intentionally toward normative goals, engage collaboratively with alternative ideas and practices, and realize change by creating contextually salient experiences.

One key aspect of this process is the creation of new narratives. Especially in unfavorable circumstances, narratives can help guide businesses to design alternative actions and goals to enable new ways of doing. Changing the narratives that provide meaning to unsustainable practices can create "the space for imaginative alternatives" to realize potential opportunities and express "different values and different visions on the (immediate and more distant) future" (Blythe et al., 2018, p. 1218; van der Leeuw, 2019, p. 2). For this purpose, narratives of change are needed to generate compelling storylines that articulate how current situations can be transformed into the desired future state through a specific course of action (Luederitz, Abson, Audet, & Lang, 2017; Wittmayer et al., 2019). Narratives of change can offer prescription and strategic orientation to businesses that are derived from the "imagined futures [that] are constructed in interaction between personal experience and the social networks in which people are embedded" (Ferraro, Etzion, & Gehman, 2015; van der Leeuw, 2019, p. 3). Accordingly, businesses that strive to transform the food sector must engage in collective negotiation because events and "artifacts are interpretively flexible" as well as the normative dimension of sustainability requires contextual realization (Ferraro et al., 2015, p. 375).

Advancing sustainability is contingent on collaborations across different actors to initiate change from within the industrialized food sector and despite conditions that may impede its transformations (Farla, Markard, Raven, & Coenen, 2012; L.-B. Fischer & Newig, 2016). This requires protective spaces for businesses to envision alternative futures and collectively support activities that seek to modify the local environment and generate the kind of profound change that is needed for advancing sustainability (Schot & Geels, 2007; A. Smith, Voß, & Grin, 2010). Constructing these spaces is crucial for providing the right niche milieu for a dedicated support community to develop, and collective agency to flourish (Raven & Geels, 2010; Raven, Kern, Verhees, & Smith, 2016).

Sustainability niche construction is also pertinent for nurturing experimentation with new ideas and artifacts as organizations learn and alter their underlying assumptions in the process of creating solutions to address unsustainability (Boon & Bakker, 2016; van Mierlo & Beers, 2020). These considerations emphasize the need for businesses to leverage context-specific resources when experimenting and situating action for sustainability contextually.

Realizing change for sustainability within unfavorable contexts also requires small businesses to mobilize entrepreneurial action to build the needed skills and expertise to purposefully organize business operations and develop strategic orientation (Baumgartner & Rauter, 2017; Kurucz et al., 2017; Runyan & Covin, 2019). This places particular emphasis on the context in which entrepreneurial action is embedded, and that businesses leverage for responding to and imagining alternative practices in the process of sustainability strategy formation and evolution (Muñoz, Cacciotti, & Cohen, 2018; Papagiannakis, Voudouris, & Lioukas, 2014). Entrepreneurial action creates opportunities for enterprises to innovate and learn through changing their goals and operations as well as potentially develop sway in sustainability transformations (Muñoz, Janssen, Nicolopoulou, & Hockerts, 2018; Zollo et al., 2013).

The purpose of this PhD research is to explore different dimensions of learning processes through which small businesses mobilize knowledge in support of action for sustainability transformations. I investigate how businesses draw on knowledge as a resource in constructing narratives of change to guide action for sustainability (Chapter 3); how they generate support for transformation processes across organizations and coordinate collective action (Chapter 4); and, how entrepreneurs contextually contribute to realizing alternative food practices through developing sustainability strategies (Chapter 5). This research follows engaged scholarship in the constructivist tradition; seeking understanding of personal knowledge as well as subjective and shared meaning to understand how meaning is produced *in actu* and how it supports action in the service of sustainability. Drawing on semi-structured interviews, participant observations, analytic autoethnography, and document analysis, I explore how learning processes generate knowledge in the service of action that contributes to developing a food sector that is just, prosperous, and sound. More specifically, I draw attention to the role that different forms of knowledge assume in supporting intra- and inter-organizational learning processes that enable businesses to purposefully take action in complex situations. Accordingly, this research seeks to answer the following questions:

Main research question:

How can small businesses generate and mobilize knowledge through inter- and intra-organizational learning in ways that support their ability to take action and contribute to transformations of the food sector toward sustainability?

Sub-questions:

1. How do small businesses mobilize narratives in creating and expressing knowledge to support transformation processes?

2. How do small businesses mobilize knowledge conversion to support sustainability niche construction processes?

3. How do entrepreneurial actions support small businesses in the formation and evolution of strategies to realize change for sustainability?

This research explores the learning process that businesses mobilize to help construct narratives of change and protective niches as well as to evolve their strategic orientation in ways that support transformations toward sustainability. Based on the above considerations, the following research objectives have informed and framed this research:

1. Develop a comprehensive understanding of how organizing principles inform, and are informed by, the narratives that small businesses construct to make sense of, and engage in, meaningful action to support sustainability transformations.

2. Conceptualize the forms of knowledge that support small businesses in constructing niches, and establish empirical support for how knowledge conversion underpins related processes.

3. Provide empirical illustrations of how the notion of entrepreneurial action supports the formation and evolution of sustainability strategies in the context of small businesses.

1.1 Literature review

This research builds on interdisciplinary scholarship for understanding how learning supports small businesses to mobilize knowledge in support of action for sustainability transformations. It brings into dialogue conceptualizations of how knowledge supports action with the notion of learning. To begin this conversation across a divergent research landscape, Section 1.1.1 navigates relevant contributions from philosophical pragmatism, organizational studies, and the geography of knowledge to provide

an overview of the scholarly contributions that inform this endeavor. Sections 1.1.2 focuses on characterizing small businesses and examine their role in building a more sustainable food sector.

1.1.1 The role of learning in mobilizing knowledge to support action for sustainability transformation

Considering the challenges involved in bringing about fundamental transformations for sustainability, it is important to better understand how learning processes support small businesses to effectively mobilize knowledge for meaningful action. This kind of learning requires small businesses to generate meaning from new ambitious action and create a shared understanding of the direction of change among independent organizations. It moves beyond understanding businesses as primarily concerned with the discovery of opportunities and emphasizes the deliberative and reflexive, inquiry-driven action involved in creating opportunities for change. "Thus, learning becomes inexorably entwined with the understanding processes" that make sense of fundamentally different experiences "and becomes 'dynamized' as it requires new and highly interactive forms of knowledge transfer and transformation over time" (Thomas, Sussman, & Henderson, 2001, p. 332, emphasis in original).

Philosophical pragmatism frames learning as a deliberate, reflexive, and experimental approach to creatively address concrete problems and generate knowledge in support of action (Ansell, 2011; Herrigel, 2010). Learning, knowledge, and action are thus intertwined in "an on-going process of problem-solving, deliberation, experimentation, sedimented over time as experience, identity, habit, skill and knowledge" (Ansell & Geyer, 2017, p. 151). This dynamic understanding of learning stresses the agency that people have over the direction of change that "denotes the result of any natural process brought to consciousness and made a factor in determining present observation and choice of ways of acting" (Dewey, 1916, p. 106). Conceiving of agency in transformation processes in this way suggests that actors are "vital beings who contribute very actively to the creation of the social world that defines them" (Herrigel, 2010, p. 19). Moreover, reflection and deliberation assume a prominent role in navigating misjudgment, multivocality of solutions, and the resulting doubt and disorientation (Etzion, Gehman, Ferraro, & Avidan, 2017; Herrigel, 2010). Reflection upon the underlying assumptions and practices as well as collective deliberations that make a given situation comprehensible through verbalized accounts enable actors to envision an alternative future and devise a course of action for bringing it about (Ansell, 2011; Herrigel, 2010; Weick, Sutcliffe, & Obstfeld, 2005). In other words, "learning empowers us to anticipate and face unexpected situations. It will help us to progress from unconscious adaptation to our environment to conscious innovation,

coevolution, and cocreation with the environment, and the development of the ability to direct and manage change" (Banathy, 1996).

The following sections further develop these considerations by examining the learning process through which small businesses encounter and understand new situations (organizational learning), how they engage in new social arrangements to collaboratively generate shared knowledge (interactive learning), and shape new perspectives on how to respond to the changed context (social learning).

1.1.1.1 Organizational learning

Organizational learning focuses on the process through which actors engage in situations, make sense of their experience, and organize the acquired insights in ways that are potentially useful for the future. This process can be conceptualized as sensemaking, which describes the social (inter)action by which actors decipher clues about new instances through actively "constructing the very situations they attempt to comprehend" to inform action (Maitlis & Christianson, 2014, p. 50). Comparing it to interpretation, Weick (1995, p. 13) states that "the key distinction is that sensemaking is about the ways people generate what they interpret." Accordingly, sensemaking is an active process that requires "reflection-in-action" as actors engage in an action context in which a novel situation is encountered and realities are constructed (A. D. Brown, Colville, & Pye, 2015; Schön, 1983, p. 50). Sensemaking is a retrospective activity to the extent that actors generate a plausible understanding of a situation through dialogue and narration that gives birth to salient categories which in turn unearths new meanings and observations (A. D. Brown et al., 2015; Cornelissen, 2012; Schildt, Mantere, & Cornelissen, 2020).

Sensemaking is the "primary site where meanings materialize" through articulating experience and composing narratives that bring order into the experienced (novel) situation (Weick et al., 2005, p. 404). These sensemaking narratives bring to life people's personal experiences, and interpretations thereof, by discursively constructing the action, actor arrangements, and context in which they are embedded (Maitlis & Christianson, 2014). Sensemaking helps to align the experiential foundations of social life with the situation in which actors (inter)act (Garud, Dunbar, & Bartel, 2011; Schiff, 2012; Weick et al., 2005). If personal experience and contextual realities have grown apart to the extent where alignment is unattainable, sensemaking enables actors to mobilize narratives of change in support of new justifications to legitimize configurations that are more suitable to the imaginary future of a specific group of actors (Schildt et al., 2020; van der Leeuw, 2019). In this way,

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sensemaking supports actors to foreshadow the alternative "sought-after society" within action contexts that otherwise would be marginalized by and subject to conventional narratives (Wittmayer et al., 2019, p. 2). In the context of sustainability, organizational learning supports actors to construct narratives that generate motivations for engaging and maintaining alternative practices, inspire new ways of doing, and revise storylines so that they offer meaningful guidance for social (inter)actions.

1.1.1.2 Interactive learning

The scholarship of interactive learning assumes knowledge as the core asset and learning as the key activity in generating social change (Asheim, 1999; Coenen & Díaz López, 2010; Lundvall, 2017). Learning is conceived as "a social activity, which involves interaction between people" (Lundvall, 2017, p. 2) which emphasizes the importance of "intra- and inter-firm co-operation and networking" (Asheim, 1999, p. 347) in the process of "creatively combining codified and tacit knowledge" (van Mierlo & Beers, 2020, p. 264). Here, tacit knowledge refers to personal knowledge generated from individual experiences and embedded in skills, expertise, beliefs, and values (Gertler, 2003; Polanyi, 2009). Explicit knowledge refers to abstract and codified knowledge that can be verbalized, assessed, and stored (Binz & Truffer, 2017; Coenen, Raven, & Verbong, 2010). In this context, interactive learning assumes a key role in translating iteratively between experiences and skills (tacit knowledge) and establish instructions and guidelines (explicit knowledge) (Hård, 1994). According to Geels and Deuten (2006, pp. 226–267), this requires translation of "local knowledge into robust knowledge, which is sufficiently general, abstracted and packaged, so that it is no longer tied to specific contexts" (Geels & Deuten, 2006; van Mossel, van Rijnsoever, & Hekkert, 2018). It is through this interactive learning process that businesses make tacitly held knowledge available to a broad range of organizations in various contexts to support experimentations with new artifacts and social arrangements (Raven & Geels, 2010; Schot & Geels, 2007; Sengers & Raven, 2015).

Yet, interactive learning necessitates trust among network organizations, which suggests the translation of explicit knowledge back to embodied knowledge as equally important (Hansen & Nygaard, 2014; Loorbach, Wittmayer, Avelino, von Wirth, & Frantzeskaki, 2020; Peng, Wei, & Bai, 2019). This observation has led some scholars to assume "tacit knowledge … [to] be the major force behind the formation of business networks" (Lundvall & Boras, 1997, p. 33); others have emphasized the importance of organizations' proximity (Coenen et al., 2010) to enable "face-to-face communication [as it] enhances the sharing of tacit knowledge" (Nonaka and Reinmöller, 1998, cited in Asheim, 1999, p. 348).

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Interactive learning, thus, offers a dynamic conception of knowledge and learning as it suggests that the business networks that collaborate in the generation and mobilization of knowledge create new social arrangements that affect their interaction (van Mierlo & Beers, 2020). Knowledge generation can be the result of social interactions that support its embodiment or articulation. Accordingly, it is not knowledge per se that drives social change, but rather it is the conversion between tacit and explicit knowledge that fuels the initiating and maintaining of interactive learning. Interactive learning assumes a key role in accommodating diverging interests over and interpretations of sustainability problems to oriented collective actions toward shared goals.

1.1.1.3 Social learning

Social learning describes a multidimensional process that includes the acquiring of knowledge, reflection upon this knowledge through communicative action, and changes in practices and social arrangements resulting from changed assumptions and purpose that guide action (Reed et al., 2010). These processes, or learning loops, require individual and collective action within and between businesses while ultimately also necessitating change in the broader social context (Argyris & Schön, 1978; Armitage, Marschke, & Plummer, 2008; Waddell, 2005). Accordingly, single-loop learning involves adjusting and improving business practices while double-loop learning reframes underlying assumptions and inquiries through which business networks, or community of practices, make sense of a given state of affairs (Armitage et al., 2008; Waddell, 2005; Wenger, 1998). Moreover, triple-loop learning involves processes that contribute to changing worldviews and goals of society that inform the orientation and purpose of businesses (Armitage et al., 2008; L. D. Brown & Fox, 1998; Waddell, 2005). Social learning, thus, supports actors to improve intentionally designed action and the alter underlying assumptions, as well as requires collective agency for contributing to changing the worldviews that direct the orientation and purpose of businesses and their networks (Argyris & Schön, 1978; Armitage et al., 2008; L. D. Brown & Fox, 1998; Waddell, 2005).

Social learning offers a multilayered conception of how individuals, organizations, and networks as well as the wider society iteratively interact in learning through change. It provides a dynamic understanding of how actors act on their environment and interact collectively – in organizations and social networks – in shaping the context out of which their diagnosing ability arises (Argyris & Schön, 1978; Armitage et al., 2008; Waddell, 2005). This process may help actors to become knowledgeable as well as change their understanding of the context in which they operate, which manifests in changed practices, attitudes, and worldviews (Reed et al., 2010). In the context of

sustainability, where improving existing procedures may not generate change at the magnitude that is needed to make process on social and environmental challenges, social learning becomes a prerequisite for fundamental transformations.

Taken together, organizational, interactive, and social learning offer three distinct yet interlinked perspectives to conceptualize learning and its relation to knowledge and action. While sensemaking emphasizes the creative ability of actors to understand complex situations and anticipate the meaning they entail, interactive learning suggests a dynamic relationship between learning and knowledge and how it supports and is supported by social networks. Social learning contributes to these perspectives a conceptualization of 'learning as changed understanding' generated from the interaction between actors and their networks and manifested in transformed practices, attitudes, and worldviews. In transformations of the industrialized food sector, the role of learning and its relation to knowledge and action is, therefore, one area that is of vital importance to generate fundamental change for sustainability.

1.1.2 The role of small business action in the food sector

Despite the advancements and benefits that the industrialized and globalized food sector has generated, it is in many ways symptomatic of the unsustainability that characterizes modern societies (Campbell, McHugh, & Ennis, 2019; Fazey et al., under review; Marsden & Morley, 2014; Spaargaren, Oosterveer, & Loeber, 2012). The long-term viability and wellbeing of society and ecosystems are at risk because of the enormous environmental burden caused by the industrialized food sector. For example, food production accounts for 92 percent of global water consumption, emits one-third of global greenhouse gas emissions, and contributes through fertilizer run-off to over 400 aquatic dead zones (Gilbert, 2012; Morley, McEntee, & Marsden, 2014; Schipanski et al., 2016). While the industrial production of every food calorie requires over seven calories of energy input, 10 percent of the potential food calories are being wasted (Armelagos, 2014; Morley et al., 2014). Moreover, the consumption of industrialized food negatively impacts marginalized groups in society and causes a variety of foodborne diseases (Armelagos, 2014; Willett et al., 2019). Although one-sevenths of the world population is considered to be undernourished, two-seventh are overweight, creating a "double burden" in many countries where both conditions co-exist (Morley et al., 2014, p. 13; WHO, 2016). Yet, the malfunctioning of the industrialized food sector has complex causes related to corporate power (Clapp & Scrinis, 2017), global trade (Clapp, 2016), and climate variability (Wheeler & von Braun, 2013) to name a few.

Solutions that address this host of problems are controversially discussed, and often oppositional approaches are suggested (Fraser et al., 2016). Morley et al. (2014) reviewed major initiatives that issued proposals for implementing sustainable food practices and identified intergovernmental organizations, governments, non-governmental organizations, research institutes, and multi-national corporations as the key actors. While they take a global perspective to address the problem, the advocated approaches often reinvigorate and provide support for the existing industrialized food sector as these proposals merely envision it to be less environmentally harmful or emphasize its readiness to meet future challenges if sufficiently improved (Morley et al., 2014).

Small businesses, although often neglected, constitute a group of actors that is considered pivotal in transformations of the industrialized food sector toward sustainability (Jennings et al., 2015). While governmental actors or non-profit organizations are equally essential for building a sustainable food sector, small businesses seem to be of particular importance for two reasons. First, they offer an alternative to the industrialized food sector that is centered around transnational corporations (Blay-Palmer & Donald, 2009). Second, their activities along the food chain – from growing food to its deposal – effectively link rural areas with urban centers and help build alternative food networks (St. Jacques, 2010; Tudisca, Trapani, Sgroi, Testa, & Giamporcaro, 2014). Thus, businesses that are small in size, owner-operated, and locality oriented may hold significant potential to accelerate fundamental transformations (Gomez et al., 2015; Schumacher, 1973). To better understand how small businesses could foster sustainability transformations, the following sections review first their structure, model, and actors; second, explore the role that they play in contributing to sustainable food production, processing, and consumption.

1.1.2.1 Small business structure and entrepreneurship

The most common business in most economies around the world is the small- and medium-sized enterprise (Ayyagari, Beck, & Demirguc-Kunt, 2007). Small- and medium-sized businesses (small business) are predominantly defined by the number of employed personnel, and most countries use a cut-off of 250 employees, although they also differ in terms of other aspects from large corporations (Ayyagari et al., 2007; Stubblefield Loucks, Martens, & Cho, 2010). Small businesses are particularly relevant for the food sector, given that, for example, 78 percent of food manufacturing enterprises in the European Union have less than ten employees (Leis, Gijsbers, & Van der Zee, 2011). Although the label suggests some degree of homogeneity, small businesses are, in fact, diverse in their structures, management styles, and innovation processes, which cannot be explained by a single

common denominator (Bos-Brouwers, 2010). Still, small businesses have some general features. They are commonly owner-operated and often have strong local orientation due to proximity with clients (Bos-Brouwers, 2010; Gomez et al., 2015; Stubblefield Loucks et al., 2010). Moreover, in comparison to large corporations, small enterprises often have a less formal organizational structure and business culture. With smaller capital resources and structure, they depend more on personal relationships and are less visible with their social engagement (Stubblefield Loucks et al., 2010). Additionally, small businesses are often linked to a locality and are embedded in a community where they gain social significance as they provide opportunities for employment, local prosperity, shape identity, and influence social life (Gomez et al., 2015; Schumacher, 1973; Westman et al., 2019).

The business model represents the enterprise's purpose and logic, and depending on internal and external influences such as the owner's objectives or the context, it may differ substantially between enterprises (W. Stubbs & Cocklin, 2008). The business model specifies how an enterprise generates value from its operation. According to Bocken et al. (2014), it can be conceptualized through three elements: 1) the products, services, and relationships with customers, summarized as value proposition; 2) the procedures, technology, and partnerships involved in its operation summarized as value creation and delivery; and 3) the formal organization, cost structure, and revenue streams summarized as value capture (Bocken et al., 2014). Changes in the business model can have substantial effects on the food sector, on how producers and customers interact, and on regional sustainability (Di Gregorio, 2017). While a change in the business model can originate from different areas and might impact the three elements of value generation at various degrees, its drivers can be grouped as technological, social, and organizational (Boons & Lüdeke-Freund, 2013). For example, technological drivers seem to predominately influence the use of natural resources and focus mainly on changes in the 'value proposition' and 'creation and delivery.' Similarly, social drivers mostly rely on the same business organization but target changes in human behavior. Organizational drivers focus on the purpose of an enterprise and could fundamentally change how enterprises go about doing business (Bocken et al., 2014).

Actors that operate businesses are often called entrepreneurs. Sustainable entrepreneurship signifies the process through which business owners and managers that drive innovations in business features and operations, as well as in their motivations and objectives, foster sustainability. This term is used by scholars researching entrepreneurship to describe different business phenomena that contribute to sustainability, including the starting and enlarging of companies, changes in conventional practices,

creation of competitive advantage, and specific personal traits (Schaltegger & Wagner, 2011). Moreover, different approaches are used to accommodate motivations to solve environmental and social problems (e.g., ecopreneurship, social entrepreneurship), or change organizations and institutions (e.g., intrapreneurship, institutional entrepreneurship) (Bruton, Ahlstrom, & Li, 2010; Schaper, 2010; Tracey & Stott, 2016). Research on sustainable entrepreneurship has synthesized and learned from these contributions (Lüdeke-Freund, 2020). Accordingly, sustainable entrepreneurs have been defined as individuals that innovate and improve the economic viability of a business through activities that contribute to ecological integrity and social justice as well as foster social change (Gibbs, 2006; Schaltegger, Freund, & Hansen, 2012). The underlying entrepreneurial action involves the profit-motivated process of discovering, creating, and exploiting opportunities that result from market failures (Cohen & Winn, 2007). This, more specifically, involves establishing or enforcing property rights of public goods, reducing transaction and information asymmetries costs, opening-up market monopoly, generating knowledge on market conditions, and raising awareness among costumers (T. J. Dean & McMullen, 2007).

1.1.2.2 Small businesses: pivotal actors in sustainability transformations of the food sector

Small businesses may operate under and give meaning to the same narratives that have contributed to the development of the industrialized food sector (Audet, Lefèvre, Brisebois, & El-Jed, 2017; Vanderplanken, Rogge, Loots, Messely, & Vandermoere, 2016; Wright & Nyberg, 2017). Narratives, in this context, are linguistic, constitutive descriptions of events and phenomena that provide sequential ordering and give meaning to the actions of actors in ways that – despite not always being explicit or fully developed accounts – can reproduce a set of values, beliefs, and practices which may invigorate change or reconstruct the status quo (Vaara, Sonenshein, & Boje, 2016). While small businesses operate "within a context largely shaped by the prevailing systems, and with which they will necessarily interact and co-evolve," they may also contribute to maintaining unsustainable practices (Mount, 2012). Considering this dynamic brings attention to the question of how small businesses can learn to effectively mobilize support for sustainability transformations "to reshape perspectives and patterns of social action and enable institutional reforms" as well as generate meaning from personal experiences within new contextual realities to contribute to developing a more sustainable food sector (A. Smith & Raven, 2012, p. 1032; Weick et al., 2005). In the sections that follow, I aim to disentangle this contradiction between oppositional movement and reinforcing support

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A key strength of small businesses is their capacity to develop alternative food networks to change how people interact with food, from the farm to the end-customer and throughout the supply chain. Examples include community-supported agriculture, rooftop gardening, or horticulture system (Dubbeling, van der Schans, & Renting, 2015; Helicke, 2015; Monllor i Rico & Fuller, 2016). Small businesses have pioneered agroecological production techniques that increase crop variety, benefit biodiversity, reduce water consumption, retain nutrients, and reduce pest pressure (MacFall, Lelekacs, LeVasseur, Moore, & Walker, 2015). The opening of new, independent retail businesses offers alternatives to supermarket chains by providing food services and goods as well as increasing accessibility in terms of location and time (Patricia Allen, 1999; Dubbeling et al., 2016; Pearson et al., 2011; Tudisca et al., 2014). Small businesses are also capable of adjusting to growing seasons of produce, sourcing food products locally, and catering to diverse social groups (both in terms of ethnicity and location), while building and maintaining personal relationships that are key for establishing trust in food relationships (Blay-Palmer & Donald, 2009; Duram & Mead, 2014; Moskwa, Higgins-Desbiolles, & Gifford, 2014; Newman, 2008; Pearson et al., 2011).

Some scholars argue that because of their local focus, small businesses have a genuine interest in building capacities in their employees and business partners through training and mentoring as well as establishing business alliances and networks to facilitate sharing of infrastructure and knowledge (Dubbeling et al., 2016; Gomez et al., 2015; Helicke, 2015; Higgins-Desbiolles, Moskwa, & Gifford, 2014; Khojasteh & Raja, 2016; Newman, 2008; Rytkönen, Bonow, Johansson, & Persson, 2013). However, small businesses frequently rely on voluntary work and often need their customers to engage in extensive preparation of food at home which, because home cooking continues to be mostly undertaken by women, may re-establish gender roles (Little, Ilbery, & Watts, 2009; Newman, 2008; Pearson et al., 2011). Some small businesses also innovate food consumption in a way that reduces waste (e.g., removing packaging or develop waste to energy concepts) (Dubbeling et al., 2016; Moskwa et al., 2014). Also, they contribute to creating a more sustainable food sector through placemaking and supporting social cohesion through local activism or community events (Conner & Levine, 2007; Duram & Mead, 2014; Hirsch, Meyer, Klement, Hamer, & Terlau, 2016; Pearson et al., 2011). These attributes enable small businesses through collective efforts to carve out or reclaim areas of operation and push back the control of corporations over some parts of the food sector; ultimately this enables people to define what they think of as appropriate food, where they sourced it, and who produces it (Ballantyne-Brodie, Ramsey, Wrigley, & Meroni, 2014; Hirsch et al., 2016; Johnston, Biro, & MacKendrick, 2009; MacFall et al., 2015). However, it seems that this right is

disproportionally given to wealthy consumers (monetarily and time-wise); This requires intentional and collective actions from different business as well as other actors to ensure inclusive and equitable opportunities are generated throughout alternative food networks (Patricia Allen, 1999; Conner & Levine, 2007; Dubbeling et al., 2016; Friedmann, 2005; Russell & Heidkamp, 2011).

The omnipresence of incumbent actors and their co-opting of terms like 'local' or 'organic' makes it difficult for small business to see their combined potential to shape food practices (Blay-Palmer & Donald, 2009; Johnston et al., 2009; Pearson et al., 2011). Some scholars have argued that small businesses can only venture into areas that provide them with a sufficient return of investment and that if they develop profitable innovations, it will not take long until transnational corporations follow the early movers (Conner & Levine, 2007; Russell & Heidkamp, 2011; Vázquez & Alonso González, 2015). This makes it difficult for small businesses to maintain their innovative niche while corporations expand their area of influence. For example, incumbent actors like supermarkets chains exercise control over food safety and quality through bulk purchase, which has increased the dependence of small businesses on big box stores (Bloom & Hinrichs, 2017; Dixon & Isaacs, 2013; Khojasteh & Raja, 2016). At the same time, small, family-owned farms support the stability of incumbent corporations through their ability to rely on unpaid labor and survive periods of no income in the event of bad harvest (Magnan, 2012; Sommerville & Magnan, 2015). Moreover, alternative local food networks may remain a 'by-product' because specific regions produce surpluses of particular foods and have deficits in other products requiring farms to rely on export to make their ends meet (Dixon & Isaacs, 2013; Hamilton, 2013; Magnan, 2012; Monaco et al., 2017).

The embeddedness of small businesses within industrialized structures complicates their ability to support sustainable food production and consumption. Nothing less than systemic change is required of the industrialized food system to enable the right milieu for small businesses to realize their potential to generate fundamental change (Loorbach et al., 2020; Schot and Geels, 2008; Smith et al., 2010). This requires transformational change within the food sector as a whole to reconfigure processes from production to consumption, and within individual organizations to collectively enact alternative futures. Regarding the food sector, transformations toward sustainability require, for example, profound changes in the resource flows (e.g., the quality of food and where it is grown and consumed), practices (e.g., how food is grown, by whom, and for whom), and beliefs (e.g., why food is grown) (Blay-Palmer, Knezevic, & Spring, 2014; J. Patterson et al., 2016; Scoones et al., 2020). Moreover, profound organizational change is required within small businesses to support

entrepreneurs in questioning the core assumptions that currently provide meaning to unsustainable practices and create space for pursing alternative futures (Blythe et al., 2018; van der Leeuw, 2019). These considerations emphasize transformational processes that "foster agency, values and capacities for emancipatory change" (Scoones et al., 2020, p. 66). Yet, sustainability transformations as social processes are inherently contested, plural, and political – they bring together different worldviews, build upon diverse knowledge, enable possibilities for diverging pathways, and engage different interpretations and agendas (Scoones et al., 2020).

1.1.3 Summary

The reviewed literature draws together interdisciplinary scholarship on the learning processes that enable small businesses to mobilize knowledge in support of action for sustainability transformations. It positions small businesses as pivotal actors in transformations of the industrial food sector toward sustainability. Building on these considerations, three areas of productive exploration emerge. First, understanding narratives of change to illuminate processes of transformations and how alternative social arrangements are narrated into existence. Second, small businesses must construct sustainability niches to protect alternative practices from a hostile environment and enable collective learning processes for sustainability. Third, the reviewed literature also illustrates the importance of entrepreneurial action to rethink how small businesses can make a difference and realize alternative social arrangements within local contexts.

1.2 Organization of this thesis

Following this introductory chapter, I elaborate on the methodology that informed the empirical research (Chapter 2). After that, I present three manuscripts that detail the empirical research of this thesis. The first manuscript explores the ability of small businesses to collectively narrate alternative realities into existence by drawing on values and beliefs that enable new meaningful action in transforming conventional arrangements (Chapter 3). The second manuscript expands on these observations by carefully examining the role of knowledge in supporting collective action to understand how small businesses can mobilize intangible assets (such as knowledge) for niche construction (Chapter 4). The third manuscript mobilizes these insights to elucidate how businesses can collectively coordinate change processes to more closely examine organizations' internal dynamics and how entrepreneurial action supports strategy development in local contexts (Chapter 5). In the closing chapter, I offer a summary of the research findings, synthesizes insights across the three

empirical manuscripts, and reflect on the significance and implications of this research program (Chapter 6).

Chapter 2
Methodology

This research explores how small businesses mobilize knowledge through learning processes in support of action that support sustainability transformations. This chapter describes the methodology that guided this research in engaging with and characterizing how different knowledge forms support action for sustainability in small businesses.

The research design follows the approach of engaged scholarship that emphasizes research 'in' over research 'on' communities of practice (Collins & Evans, 2007; P. Wells & Nieuwenhuis, 2017). This approach focuses attention on the experiential immersion of the researcher in the particular context that is being studied to conduct an "inquiry from the inside" because investigations from the perspective of an outsider may fail to understand the significance of events and the relevance of specific aspects in the context of the studied phenomenon (Evered & Louis, 1981, p. 385). I chose to follow this approach because I am interested in uncovering and understanding the meanings that actors associate with their actions (Gephart, 2004). The experiential immersion supported me in building a better understanding of how the investigated learning processes, different forms of knowledge, and action materialized in the research context (Antony, 2015; Baumard, 1999). This deep involvement in the action context made it possible to capture learning as an interactive and emergent process and contributed to my understanding of the particular situation (P. Wells, 2016). Accordingly, this research is interpretive in its nature and does not seeking generalizability of findings but rather "empathetic understanding of social phenomena" (Lincoln, 1998, p. 15).

My research relies, first, on interpretivism to reveal and interpret the actual meaning that people ascribe to actions and situations. Second, I build on pragmatism to conceive of knowledge and action as mutually constitutive, and learning as a deliberate, reflexive, and experimental process. Interpretivism, following the constructivist tradition, aims to understand personal knowledge as well as subjective and shared meanings, their production *in actu*, and their relevance for guiding action (Goldkuhl, 2012; Guba & Lincoln, 1994). It appreciates the existence of multiple realities as people make sense of and construct their social world through personal experience (Kirby, Greaves, & Reid, 2006). Interpretivism allows for emphasizing the "experiential foundation" of socially constructed phenomena transforming the often discussed tension between the nature of the 'outside' reality and the 'inside' world into different dimensions of experience (Renn, 2015, p. 125). In other words:

> *"On one hand, our experiences in the world are necessarily constrained by the nature of that world; on the other hand, our understanding of the world is inherently limited to our interpretations of our experiences. We are not free to believe anything we want about the world if we care about the consequences of acting on those beliefs."* (D. L. Morgan, 2014, p. 4)

From this perspective, the relationship between the spectator (i.e., a knower) and the 'thing' that is being observed (i.e., a thing known) are interactively linked and co-created through the process of inquiry (Dicker, 1973; Guba & Lincoln, 1994). Meaning is created through lived experiences; understanding of it requires the perspective of an insider who is engaged in meaningful action and embedded in the particular context out of which meaning emerges, centering research on human experience (instead of, for example, the nature of reality) (J. N. Hall, 2013). In line with this understanding, I am interested in exploring different learning processes of coming-to-know and their consequences, as well as what forms of knowledge they generate and the type of action this knowledge can support.

To guide this research, I draw on philosophical pragmatism to understand how knowledge is generated and used in the investigated empirical case studies (Ormerod, 2006). Instead of separating mental and physical subjects, pragmatism offers a transactional understanding of self and situations as "mutually constituting aspects of an integrated unity" (Elkjaer & Simpson, 2011, p. 70). This articulates the "inseparable link between human knowing and human action" as actions are guided by and generate the purpose that actors pursue (Goldkuhl, 2012, p. 139). This conceptualization frames knowledge as a process of inquiry and problem-solving through experimentation, emphasizing the inherently social process of knowledge generation and mobilization (Dewey, 1906; Haye & Torres-Sahli, 2017; Popa, Guillermin, & Dedeurwaerdere, 2015). Knowledge is, therefore, inseparably linked to the learning process; learning processes, in turn, take place when individuals and collectives confront and construct the contextual realities in which action are embedded. It is this interrelated process of learning, knowledge, and action that underpins and shapes the normative orientation, experience, sensemaking, and agency of actors (Ormerod, 2006; Popa et al., 2015; S. Wells & Quartey, 2017).

Using an interpretive approach and relying on a pragmatist understanding of the relationship between knowledge and action, I embark on an inquiry of the craft brewing movement seeking to understand the forms of knowledge and the types of action that support sustainability. This research

involves triangulation of different forms of qualitative inquiry, drawing on semi-structured interviews, participant observations, analytic autoethnography, and document analysis (Baumard, 1999; Goldkuhl, 2012; J. N. Hall, 2013; Johnson & Turner, 2003). My research moves through two stages that involve the selection of case studies and the engagement in research. These two stages are characterized by an iterative four-step procedure that includes: 1) selecting case studies and unit of analysis; 2) designing methods of inquiry and conducting research, 3) processing and analysis of gathered material; and 4) ensuring the trustworthiness of the research. In the following sections, I describe these iterative steps in detail before I reflect on the limitations of this research and my positionality in this process.

2.1 Selection of a case study: the craft brewing movement

The brewing sector is an area characterized by an uprising of craft breweries: small businesses that are contributing to the fundamental transformations of this industry. The brewing industry shares key challenges with other food processing sectors: the sourced raw materials are highly variable; supply chains are intricate; and brewing ingredients are sensitive to oxidation and spoilage. These challenges interact in complex ways, which makes knowledge, and in particular tacit knowledge, a prerequisite to successfully navigating this sector (Senker, 1993; Wunderlich & Back, 2009). Moreover, the brewing industry illustrates and embodies key dynamics of the industrialized food sector, including internationalized supply chains, being dominated by few globally operating transnational corporations, and high levels of homogeneity across regions (Gammelgaard & Dörrenbächer, 2013; Howard, 2014).

The brewing industry is of particular interest to this research as the emergence of craft breweries has started to transform a sector that predominantly produces a single, homogeneous product in a highly concentrated market with few opportunities for new entrants (Elzinga, Tremblay and Tremblay, 2015). The brewing industry has been significantly shaped by industrialization and profit maximization. For example, investments into brewing technology and automatization of processes established economies of scale made industrialization the precondition for brewing (in contrast to environmental characteristics) and resulted in a "dramatic restructuring of national beer markets for mass-produced beer" (Madsen & Wu, 2016, p. 35; Meussdoerffer, 2009). Moreover, the narrowly defined motive to increase profits drove the process through which beer companies quickly became globally operating firms, and consolidation through mergers and acquisition resulted in four transnational corporations that dominate domestic and international markets and are set on a

trajectory to establish a global monopoly (Ascher, 2012; Garavaglia & Swinnen, 2017; Howard, 2014). For example, in the United States, these dynamics resulted in a "highly concentrated market structure [and] homogeneous output" that made industrially produced products "nearly indistinguishable from another" (Elzinga, Tremblay, & Tremblay, 2015, pp. 243; 255; Gammelgaard & Dörrenbächer, 2013).

With regard to sustainability efforts, large beer corporations can be observed to carefully select initiatives showing commitment to lower carbon emissions, increase renewable energy, and decrease resource consumptions. Yet, scholars such as Jones (2013) have criticized such efforts as lacking real commitment to sustainability because the mentioned initiatives primarily serve the growth engines of transnational corporations by reducing costs or increasing sales (E. Jones, 2018; P. Jones et al., 2013; van Beemen, 2019). This dynamic has been noticed as a critical challenge to making progress on sustainability transformations as technology-focused improvements are utilized for maintaining the status quo (Blythe et al., 2018).

The brewing industry, with its concentrated and mature market structure and fierce competition, seemed to provide an unlikely context for new entrants to emerge (Acitelli, 2013; Datta, 2017; Elzinga et al., 2015). In fact, most analysts suggested the opposite in the 1980s (Carroll & Swaminathan, 2000). For example, drawing on the organizing principles of market competition, Porter (1980) suggested the brewing industry as an illustrative example of how high barriers to entry are created by established transnational corporations that ensure brand loyalty of customers through industrialized production, distribution, and marketing. Similarly, conventional wisdom among industry professionals during that time suggested that breweries needed to distribute their product widely, increase production capacity to utilize economies of scale, and rely on extensive marketing to reach consumers and establish their loyalties (Acitelli, 2013; George, 2009; Gourvish, 1994; Porter, 1980). Since then, the industry has grown more competitive across countries as the overall market capacity has decreased with total and per capita consumption of beer declining (Reid, 2018). For example, from 1980 to 2017, per capita consummation fell in the United States, Canada, and Germany by 15.7, 27.6, and 31.4 percent, respectively (Gourvish, 1994; Kirin Holdings, 2018; Weersink, Probyn-Smith, & Von Massow, 2018).

It is in this context that craft breweries have developed a protective niche to organize and coordinate collective action in support of diversity, independence, artisanship, locality, and small-sized operations (Garavaglia and Swinnen, 2017; Murray and O'Neill, 2012). Craft brewing

commonly refers to the artisanal-inspired production process of a brewery that is small and independently owned (Acitelli, 2013; Brewers Association, 2014; Cottone, 1986). Small refers to the production size of the brewery, which usually means an annual output that does not exceed 7 million hectoliters; however, most craft breweries may never produce more than 5,000 hectoliters per year. Independently owned indicates that less than 25 percent of the business is owned by a non-craft brewery. Artisan-inspired practices refer to brewing that relies on natural ingredients (as opposed to artificial additives) and emphasizes beer traditions in the production of beer as well as aims to showcase the skillful work of the brewers.

Craft breweries have championed sustainability experimentation which researchers observed to have a variety of localized impacts, for example:

- relocalizing production and consumption (Fox Miller, 2017; Maier, Klein, & Schumacher, 2020), sourcing ingredients locally (Maier et al., 2020; Ness, 2018);

- revitalizing distressed city districts (Barajas, Boeing, & Wartell, 2017; Reid, 2018);

- developing local heritage and culture (Argent, 2018; Feeney, 2017; J. Gatrell, Reid, & Steiger, 2018); as well as

- driving local employment and strengthening regional economic opportunities (Dangaran, Wruck, & Watson, 2016; S. R. Miller, Sirrine, McFarland, Howard, & Malone, 2019), and generating local multiplier effects on money spent locally (Dangaran et al., 2016).

At the same time, the emergence of craft breweries gave rise to a trans-local networked enabling "a rising tide lifts all boats mentality that facilitate[s] a 'united front' with 'unified goals'" (Mathias, Huyghe, Frid, & Galloway, 2018, p. 2101, emphasis in original). This shared identity is characterized by an ethos of cooperation among craft breweries within an industry that is otherwise fiercely competitive (Datta, 2017; Depenbusch, Ehrich, & Pfizenmaier, 2018; Lamertz, Foster, Coraiola, & Kroezen, 2016). These aspects of diversity, independence, artisanship, locality, and small-sized operations that craft breweries are accelerating are central to the normative dimension of sustainability (Blay-Palmer, Sonnino, & Custot, 2016; Douthwaite, 2005). Moreover, related interventions and experiments in craft brewing rely on geographically-embedded learning processes to create, combine, and apply technical and social insights in new ways (D. W. Murray & O'Neill, 2012; M. Patterson & Hoalst-Pullen, 2014; M. Patterson, Hoalst-pullen, & Pierson, 2016).

The roots of the craft brewing movement, also referred to as the "craft beer revolution," are found in the United States; since their inception, small breweries have mushroomed across countries, transforming a commodity into a product imbued with meaning (Garavaglia & Swinnen, 2017, p. 15). Craft brewing as a new approach to beer production developed in the United States in the 1960s and 1970s and has been gaining considerable prominence during the last three decades. While at the beginning of the 1980s, 40 major breweries controlled 97.4 percent of the US beer market, the eight microbreweries that existed at the time did not have any market shares (imports made up the remaining 2.6 percent) (Elzinga et al., 2015). In 2018, the picture looked significantly different, with a total of 7,450 craft breweries operating, making up 99 percent of all breweries and collectively accounting for over 13 percent of the national market (Brewers Association, 2019; Garavaglia & Swinnen, 2017). However, in some regions – due to the geographical localization of craft breweries (i.e., high concentration of craft breweries within a region) (Carr, Fontanella, & Tribby, 2019) – their market share may exceed 50 percent (Interview).

2.1.1 Research sites: the craft brewing movement in Canada and Germany

The research that I present in Chapter 3, 4, and 5, focuses on two local contexts to examine how craft breweries engage in learning processes to mobilize knowledge in support of action for sustainability. To identify two cases studies of the craft brewing movement – one in Canada and one in Germany – I applied a purposeful sampling strategy. I select these two countries because of the significantly different industry context and developmental trajectory in the respective brewing sector. The differences between the case studies create the necessary conditions for exploring context-specific learning process to better understand how the creation of narratives, conversion of knowledge, and entrepreneurial action vary and interrelate across the two research sites.

Comparing how craft brewing is transforming the industry in Canada and Germany is particularly interesting, considering the differences and similarities in the history and governance of beer and breweries between these countries. Beer is of cultural significance both in Canada and in Germany (Depenbusch et al., 2018; Weersink et al., 2018; WHO, 2018). Yet, diverging dynamics in the history of these two counties have influenced how respective governments and civil society approached beer in more recent years. In Canada, the temperance movement in the 19th century and the prohibition of alcoholic beverages are key events (Weersink et al., 2018). In Germany, it is the nation-wide adoption of the *Reinheitsgebot* – a beer purity law that initially restricted brewing ingredients to barley, hops,

yeast, and water – at the beginning of the 20th century (Depenbusch et al., 2018). In the sections that follow, I elaborate further on these dynamics.

In Canada, the temperance movement and legislation of prohibition at the beginning of the 20th century have fundamentally shaped the brewing industry by enforcing restrictions on business possibilities (Lamertz et al., 2016). The Canadian brewing industry is amongst the most heavily regulated in the country, and special licenses are required from federal and provincial governments for operating a brewery (Giesbrecht, 2017; Macneill & Bellamy, 2019). Also, beer distribution, retail, marketing, and pricing are government regulated. The province with the highest population, Ontario, for example, has the most ridged regulation in place that limits distribution to the government-operated liquor store and the Brewers Retail corporation (Lamertz et al., 2016; Weersink et al., 2018). The latter is majority-owned by the two largest and foreign-owned breweries in the country and accounts for over 78 percent of beer sales, being "consistently accused of putting other, smaller breweries at a disadvantage" (Lamertz et al., 2016, p. 814; Weersink et al., 2018). These dynamics, combined with mergers and acquisitions of breweries, have created a concentrated market that is dominated by international conglomerates that produce homogenous products (Giesbrecht, 2017). For example, the largest two corporations controlled 50 percent of the Canadian market in 2018 (Couillard, 2019). In 1984, for the first time after prohibition, the operation of small breweries was permitted in Canada, which gave rise to businesses that were modeled after craft breweries in the United States (Lamertz et al., 2016). In Canada, smaller breweries also benefit from progressive federal taxation of beer that favors lower alcohol content and smaller production size. By 2015, 540 microbreweries were in operation with an output of fewer than 5,000 hectoliters per year (this number doubled since 2011), and craft breweries collectively accounted for 6 percent of the Canadian market share (Weersink et al., 2018).

In contrast, Germany, in line with the *Reinheitsgebot* – a beer purity law that was initially adopted in 1516 in one region of Germany – has regulated beer consumption and production primarily through taxation instead of special licenses (Depenbusch et al., 2018). While the Germany-wide adoption of the purity law in 1906 initially restricted brewing ingredients to barley, hops, yeast, and water, later revisions made it possible for brewers to use technical additives (Eble & de Vries, 2018). Germany has maintained a fairly fragmented beer market with a strong focus on regional diversification through progressive taxation that benefits smaller producers as well as tied-house agreements (i.e., exclusive contracts between breweries and pubs) that safeguard regional distribution systems (Adams,

2006; Depenbusch et al., 2018). While the number of microbreweries (defined by Depenbusch (2018) as breweries with an output of fewer than 10,000 hectoliters per year) in Germany were decreasing to 639 until 1990, there has been a resurgence since 2003 and microbreweries increased to 1,058 in 2015, with two-thirds producing fewer than 3,000 hectoliters per year (Depenbusch et al., 2018; Gourvish, 1994). In 2015, microbreweries accounted for more than 75 percent of the German market, while their production output has increased by 2 percent since 2011 (Depenbusch et al., 2018). Craft brewing, as known in North America, has gained popularity in recent years, but because of the continued existence of microbreweries, these dynamics are less pronounced in comparison to Canada (Depenbusch et al., 2018). Determining the exact market share of craft breweries is difficult as Germany always had small and regional breweries with an emphasis on craftspersonship[1]. A rough estimate, which was also mentioned by interviewees of this research, suggests North American-influenced breweries now make up for approximately 1 percent of the market share (Drinktec, 2019).

In both contexts, craft breweries aspire to similar goals that mirror dynamics in the United States (see, for example, Elzinga et al., 2015; J. Gatrell et al., 2018) as they work on diversifying and pluralizing conventional arrangements and practices. Based on the conducted research, I suggest that in Canada, craft breweries feel marginalized by regulatory constraints, which are perceived as favoring large corporations and by the ignorance of some customers who have come to accept narrowly defined consumption arrangements around an industrialized product. In Germany, craft breweries perceive large corporations as having utilized restrictions, such as the purity law, to their advantage by deceiving customers and making them believe in the purity of an industrialized product. Moreover, smaller (non-craft) breweries are seen as assisting this development by their narrow interpretation of what craftspersonship encompasses. In both contexts, craft breweries reinterpret historical events to cast a new light on traditional practices, reengineer equipment to make it suitable for small-scale production, and change the conversation around beer to decommodify a homogeneous product and emphasize the importance of local producers. Moreover, in both countries, craft breweries rely on each other to circumvent context and industry-specific challenges, similarly to dynamics in the US (see, for example, Acitelli, 2013; Mathias et al., 2018; Nilsson, Reid, & Lehnert, 2018). Likely the probably most visible indication of this collegial attitude in both contexts is the existence of 'collaborative brewing initiatives,' which initially emerged in 2006 in the United States

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[1]This term is intended to emphasize that artisanship can be pursued by people of different gender, race, and ethnicity whereas the common denomination of craftsmanship may insinuate a binary understanding.

(Kraus, Klimas, Gast, & Stephan, 2019). These initiatives center on a partnership with two or more breweries collaborating in the design, production, and distribution of a product.

Based on this overview, craft brewing can be framed as an alternative food network (see Section 1.1.2) (Maier et al., 2020). Alternative food networks present deliberate attempts to create otherness in the industrialized food sector; they aim to change where and how food is produced and consumed – by whom, through what process, and for whom – promote participation of, and learning among diverse actors, and re-spatialize food by rebuilding intentional connection to the place where these social, cultural, and environmental relationships unfold (Forssell & Lankoski, 2015; Kirwan, 2004; Parrott, Wilson, & Murdoch, 2002). Moreover, the alterity and embeddedness of such networks are believed to be central for creating alternative social arrangements as they mobilize "locally distinctive products… to defend local agricultural production from the centralising influence of the mainstream food industry" and may also generate significant social-ecological benefits (Brunori, Galli, & Rossi, 2004, pp. 333–334; Forssell & Lankoski, 2015; Maier et al., 2020; Marsden & Smith, 2005; Tudisca et al., 2014). While analyses of other food sectors such as cheesemaking (Paxson, 2013) or winemaking (C. Smith, 2013) have provided insights on how such craft-focused initiatives generate fundamental change in their respective industry, the impacts of related alternative food networks often remain constrained to one specific geographical area. In contrast, craft brewing has expanded its footprint across countries and has gained a significant role in urban and rural development. Accordingly, this subject area can offer rich learning opportunities for addressing the questions of this research.

2.1.2 Selection of unit of analysis

In line with the interpretive research outlined above, I apply a qualitative comparative case study approach (R. Elliott & Timulak, 2005; Yin, 2009). Craft brewing is a nationwide phenomenon in Canada and Germany, and potential case studies that could help to answer the research questions are numerous. Following Elliot (2017), I developed six conditions for case selection (see Table 2.1). These are intended to ensure sufficient opportunities for observation 1) and that effects are pronounced 2), specify the shape and form of the phenomena investigated 3) & 4), delineate the boundaries of the case study 6), and clarify underlying assumptions of this research 5). Based on these considerations in combination with the researcher's familiarity with the research context, I selected two cases, one in Canada (southwest Ontario) and one in Germany (northern Germany). Although nouns such as 'case' or 'system' suggest a tangible entity with definite boundaries, the

focus of this research is on "the process of 'formulating' a system" of interest, making the boundaries of a case subject to the research" (Ison, 2008, p. 140, original emphasis).

Table 2.1: Considerations that facilitate case study selection

'X' qualifies as a case study only if:
1. 'Beer activities' (i.e., products, events, social groups, etc.) and 'beer organizations' (i.e., breweries or brewpubs) exist that cater to the local population.
2. Beer-related activities and organizations have existed in X for a continued number of years.
3. One set of outputs of X is the availability of products, reports, and information material, advertising, and events, with at least some of it created by members of a 'beer organization' in line with (5) or in reaction to (4).
4. Another set of outputs includes documentation (i.e., written, visual, audio, etc.) about activities, organization, or the industry (which may include content created by members of 'beer organizations').
5. As part of X, relevant activities and organizations pursue a specific set of goals and aspirations.
6. X is partly constituted by the relevant activities and organizations residing in X (as they pursue the goals from (5), produce the outputs in (3), and contribute to the outputs in (4)), and partly by relevant activities and organizations residing outside of X (governments, non-governmental organizations, beer organizations, experts).

The 'case' in this research is a geographically bounded business network. The unit of analysis is the learning process in which breweries engage in by mobilizing knowledge in support of action for sustainability through individual and collective efforts (Baxter & Jack, 2008). Based on the considerations outlined in Table 2.1, I analyze in each case existing craft breweries by examining related businesses, craft beer-related events and activities, documentation thereof, and other non-brewery related organizations (see Table 2.2). To select relevant data sources, I followed a purposeful sampling to ensure the selection of "information-rich cases for in-depth study … from which one can learn a great deal about issues of central importance to the purpose of the inquiry" (Patton, 2015). The following sections elaborate on the different data sources.

Table 2.2: Summary of research focus and data sources

Data source	Description	Methods for collecting primary (P) and secondary data (S)
Craft brewery	Brick and mortar brewery that houses a brewhouse, employs people, and may or may not include adjacent businesses (e.g., restaurant, homebrew shop, beer shop).	Interviews (P)
Craft beer-related events and activities	Gathering of people for a specific purpose, organized by a brewery or a third party, as well as activities carried out within a brewery.	Autoethnography (P) Observations (P)
Craft beer and brewery documentations	Documentation of action carried out by the brewery (produced by the brewery or a third party).	Secondary documentation (S)
Non-brewery related organizations	Associations promoting craft brewing.	Interviews (P), Autoethnography (P)

2.1.2.1 Craft breweries

In each case, the research focuses on relevant craft breweries. For this purpose, I screened outputs produced by breweries located in the case studies as well as outputs generated by other organizations

about the respective brewery to ensure representation of the examined phenomenon. The initial screening in early 2018 resulted in 15 and 14 relevant businesses, respectively, for the Canadian and the German case. Table 2.3 provides an overview of the different types of craft breweries, and Table 2.7 lists the conducted interviews.

Table 2.3: Overview of identified types of craft breweries

Brewery description	Brewery type	Business model
2-20 hectoliter brewhouse, 3-10 brewery-related employees, local to regional distribution; yearly production volume below 10,000 hectoliters	I	Focus on-premise sales through the taproom located in or next to the production facility.
	II	Same as type I and the brewery also operates another business in conjunction, such as a restaurant, homebrew shop, event management, or beer shop.
21-50 hectoliter brewhouse, 30-50 brewery-related employee, distribution extends beyond the region, yearly production volume above 10,000 hectoliters	III	Focus on off-premise sales through distributors. The production facility is usually accompanied by a small taproom.
	IV	Same as type III, and the brewery also operates another business in conjunction, such as a restaurant or beer shop.

2.1.2.2 Events and activities

The research includes relevant events and activities, which I selected based on my immersion in the research context, because related events and activities may not be publicly announced, are only retrospectively identifiable as such, and their significance may depend on repetition. For example, breweries as meeting points for community members are not announced ex ante, are identifiable as such only *in actu* or *ex-post*, and require frequent, but often irregular occurrence (as people meet each other unexpectedly) for developing social significance. Accordingly, I conceptualize three types of events and activities for this purpose, as described in Table 2.4.

Table 2.4: Overview of relevant events and activities

Data source	Description	Illustration
Public events	Announced and hosted by a brewery or third-party.	Product release events, educational events, openings, tap-takeovers, and pop-up events.
Unplanned activities	Social interaction in public spaces.	Meetups and discussions.
Organized activities	Regular meetups in public or semi-public locations, formally organized by a brewery or a third party.	Association meetings, social group meetings, and private events.

2.1.2.3 Documentation

This research builds on relevant documentation. Interviewees' suggestions in combination with my immersion in the researcher context informed the selection of pertinent documentation. In particular, I focus here on identifying media through which knowledge processes and action could be captured *in actu* and would not be subject to distortion through reconstruction (as may be the case for interviews). I identified three different media for this purpose (see Table 2.5): 1) social media platforms where

breweries upload visual depiction (photo and video material) of the unit of analysis, which allows capturing details that evades articulation; 2) publicly available discussions such as podcasts (i.e., episodic series of audio files) that capture conversations among experts about technical challenges, practices, and approaches; and 3) websites of breweries and other organizations to capture self-presentations. Snowball sampling strengthened the selection of relevant material. I started from a small iteratively complied set of sources while I added and removed relevant documentation based on suggestions and cross-references (Spence, Lachlan, & Rainear, 2016).

Table 2.5: Overview of relevant documentation

Data source	Description	Illustration
Shared photos	Social media accounts of breweries under which they publicly share photos.	Pictures may depict regular and special activities of breweries and allows to capture interactions between breweries.
Audio episodes	Various long-form audio recordings of different brewing podcasts that cover conversations among brewers and experts.	Episodes are usually hosted by industry experts or a brewery and focus on knowledge sharing and reconstruction of specific actions.
Internet websites	Websites that breweries use to present themselves to the public, report on their history and publicize news about the business	Brewery websites present self-published content about the business.

2.1.2.4 Relevant organizations

This research also includes other relevant organizations that promote craft brewing. Interviewees' suggestions in combination with my immersion in the researcher context informed the selection of relevant associations (see Table 2.6). While researching these organizations revealed significant insights into their role as intermediaries that bridge and connect different businesses, it also highlighted that more informal knowledge generation and sharing that was not mediated by formal associations assumed a crucial role. More specifically, the observed learning processes among the interviewed breweries (see Section 2.1.2.1) resulted often from *ad hoc* interactions, and sometimes interviewees explicitly stated their disregard for regional associations and formally organized networks. Therefore, I shifted the focus to analyze two different types of organizations: national and international brewery-related associations and homebrew clubs. I confirmed the importance of professional associations through the interviews as these organizations play an essential role in sharing codified knowledge and coordinating concerted efforts among breweries. I also confirmed the importance of informally organized homebrew clubs through the interviews as this type of organization is considered key to the inception of craft brewing in general, and professional brewers often originated from such formal or informal groups.

Table 2.6: Overview of relevant non-brewery organizations

Data source	Description	Illustration
Brewers' associations	Interest groups that promote the advancement of brewing.	Such groups can be formally organized as well as informal networks may exist through which knowledge sharing is facilitated either through regular conferences or online platforms or both.
Homebrew clubs	Formal or informal groups that are organized by armature brewers and promote brewing, organize regional events, and often act as a springboard for professional brewers.	Such groups are often informally organized and may convene meet-ups or knowledge sharing through online platforms.

Based on these sources of data, I draw on empirical analysis across the two case studies to examine the unit of analysis to allow for thick descriptions of the investigated phenomenon. The next section details the research methods and the data collection process.

2.2 Methods

In the following sections, I discuss the research methods for the collection of primary and secondary data on the learning process of craft breweries as well as the analytical procedure for examining the gathered material. I describe four methods for collecting relevant material, the processing and preparation thereof, and the different analyses that were performed.

2.2.1 Methods of inquiry

In total, I employed four methods of inquiry in the course of this research. This research has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee (ORE #22768).

2.2.1.1 Semi-structured interviews

This research builds on in-depth semi-structured interviews with key informants to gather primary data (Fylan, 2005). The purpose of semi-structured interviews is to gain a deep understanding of the interviewees' perspectives on the research subject through conversation (Fylan, 2005; Werner & Schoepfle, 1987). While this interviewing technique allows conversations to follow leads that are relevant to an interviewee, it also keeps the interview focused on a set of predetermined topics and questions (Bernard, 2013). The interview guide that helped to accomplished this goal-focused questions on four broad topic areas: 1) the business purpose of a brewery; 2) the course of action taken to realize this purpose and address specific challenges; 3) knowledge and learning within and among breweries; and 4) the importance of the local context (Halinen & Törnroos, 2005; Whitehead,

2005). I developed the interview guide based on relevant literature and key areas of interest (see Appendix A). In collaboration with a small food business that was not part of this research, I piloted the interview guide in Canada before conducting the interviews that were relevant to this research.

I conducted interviews in English or German between 2018 and 2020. In total, I completed 34 interviews with owners or employees of breweries, shareholders, related businesses, consultants, and industry experts (see Table 2.7). The interviews were audio-recorded and lasted between 33 minutes and 3 hours and 48 minutes, with the average being 1 hour and 6 minutes.

The use of all direct quotes that I lifted from the transcripts or paraphrased based on recorded conversations for the use in this thesis was confirmed by the respective interviewee. For the quotes that I translated from German to English, I also sought approval from the respective interviewee for using the translated statement.

Some of the interviews that I conducted involved more than one participant (see Table 2.7). While this was not the initial intention when arranging the interviews, I adapted the conversation to the respective setting or preferences of the contact person. The interviews with more than one interviewee often offered opportunities for nuanced and detailed discussions as more than one perspective was represented. Sometimes, however, the interviewees also contradicted or clarified each other's statements as people remembered or experienced events and situations differently. This was helpful for me to develop a more comprehensive understanding of how interviewees may vary in their descriptions of the same or similar actions. While the focus of this research was on leaning processes and personal interpretations thereof rather than validating factual statements by the interviewees, potentially conflicting descriptions did not pose a significant difficulty for the analysis also because follow-up conversations helped to clarify what I may initially have perceived as a contradiction.

Table 2.7: List of conducted interviews

#	Interview description	Date	Location
1	Co-owner of a microbrewery	May 17, 2018	Canada
2	Co-owner of a microbrewery	May 23, 2018	Canada
3	Co-owner of a microbrewery	May 31, 2018	Canada
4	Co-owner of a microbrewery	June 4, 2018	Germany
5	Two co-owners of a microbrewery	June 4, 2018	Germany
6	Co-owner of a brewpub	June 5, 2018	Germany
7	Interview with co-owner of a brewpub	June 6, 2018	Germany
8	Regional brewery manager	June 6, 2018	Germany
9	Two co-owners of a microbrewery	June 7, 2018	Germany
10	Co-owner of a beer shop	June 21, 2018	Germany
11	Co-owner and brewer of two different microbreweries	June 21, 2018	Germany
12	Head brewer of a regional brewery	July 26, 2018	Canada
13	Co-owner of a microbrewery	July 31, 2018	Canada
14	Co-owner of a microbrewery	August 10, 2018	Canada
15	Interview with co-owner of a microbrewery	August 29, 2018	Germany
16	Founder of a brewery association	August 29, 2018	Germany
17	Co-owner of a microbrewery	August 30, 2018	Germany
18	Manager of a regional brewery	August 30, 2018	Germany
19	Co-owner of a microbrewery	November 20, 2018	Canada
20	Vice president of a large brewery	November 20, 2018	US
21	Co-owner of a brewpub	November 26, 2018	Canada
22	Two shareholders of a brewpub chain	December 1, 2019	Canada
23	Co-owner of a brewpub chain	December 4, 2018	Canada
24	Co-owner of a microbrewery	March 26, 2019	Canada
25	Co-owner of a microbrewery	March 29, 2019	Canada
26	Co-owners of two different microbreweries	May 8, 2019	Canada
27	Co-owner of a microbrewery	May 16, 2019	Canada
28	Co-owners of two different microbreweries	May 23, 2019	Canada
29	Industry expert	May 30th, 2019	Canada
30	Co-owner of a microbrewery	September 1, 2019	Canada
31	Co-owner of a microbrewery	December 27, 2019	Germany
32	Co-owner of a brewpub	January 22, 2020	Germany
33	Co-owner of a brewpub	March 27, 2020	Germany
34	Co-owner of a brewpub	April 3, 2020	Germany

2.2.1.2 Participant observations

This research was conducted through participant observations. This method puts the researcher "where the action is" to support "learning through exposure" and "involvement in the day-to-day or routine activities of participants" (Bernard, 2013, p. 310; Gephart, 2004; Schensul & LeCompte, 2013, p. 83). Observations allow for building a holistic understanding of the action contexts that are the focus of this research and how knowledge processes support action in natural settings (Kawulich, 2005).

This research includes both unobtrusive and reactive participant observations to interrogate the actions and settings that support and are served by the examined learning processes. Unobtrusive observations allow studying the actions of people without making them actively aware of the presence of the observer (Angrosino, 2007). Unobtrusive observations were carried out in public settings, including brewery taprooms, restaurants, shopfronts, and event venues. In these settings, I

focused on the interaction between individuals working for a brewery or relevant organization and customers. Reactive observations require the consent of the involved people that also grant entry to settings that are otherwise not accessible to the public (e.g., brewery space, storage facilities, etc.) (Bernard, 2013). This type of observation focuses on the people working for a brewery or relevant organization and their interaction in the process of crafting the respective product/service. In both of these settings, the purpose of participant observations is to identify patterns and concepts relevant to the people engaged in the respective setting and study the actions that meanings are ascribed to (Angrosino, 2007; Bernard, 2013; Werner & Schoepfle, 1987)

Observations were conducted in various settings in 2018 and 2019 that all involved the immersion of the researcher therein (Werner & Schoepfle, 1987). Table 2.8 organizes the performed observations according to three areas, including activities related to diversity, collaboration, and community involvement.

Table 2.8: Overview of observations

Areas of activity	Activity	Description	Number of events (duration in h)
Diversity	Structured tastings	This involved observation of formal and informal events and focused on how customers engaged with brewery products.	6 (2h)
	Educational activities	This included observation of events hosted by breweries or other organizations that focused on awareness-raising for a specific cause.	4 (1h)
Collaborations	Collaboration brews	This involved observation of a collaborative brewing initiative on the premise of a commercial brewery.	1 (6h)
	Collaboratively hosted events	This involved observation of collaboratively hosted events involving breweries and bars.	9 (2h)
Community involvement	Social engagement	This involved observation of events that one or more breweries hosted or participated in to engage their customers for a specific purpose, including fundraising for charities.	10 (2h)
	Community events	This involved observation of events that breweries hosted in collaboration with other non-brewery organizations for a social purpose.	6 (1h)

2.2.1.3 Analytic autoethnographic research

This research involves analytic autoethnography. This research method helps built a deep understanding of the examined cases and to analyze my personal experience in order to comprehend cultural experience (Anderson, 2006; Ellis, Adams, & Bochner, 2011). Analytic autoethnography research aims to complement and overcome the limitation of other forms of data gathering that are restricted to abstract knowledge that verbalizes and narrates "ex post interpretations of specific phenomena" (Antony, 2015, p. 149). This method explicitly focuses on primary experiences; understanding the shared reality of the research subject which is contextual and experiential as well as

acquired and expressed through action, while supporting trans-action between conceptual abstraction and empiricism (Baumard, 1999; Crane & Bontis, 2014; De Rond, Holeman, & Howard-Grenville, 2019; Hirschauer, 1994). Put it differently, analytic autoethnography is not focused on inquiring what organizes the "lived order," but is "concerned with 'living' the lived order" of the research subject so that the researcher becomes "an auxiliary to the particular profession or work site under consideration" (Pollner & Emerson, 2007, p. 124). This aligns with the engaged scholarship that guides this research as the focus of analytic autoethnography is not on gathering data *about* the case but to build on the personal experience of the researcher in developing empathy *for* the case through enactive learning (i.e., "understanding of the thoughts, feelings, and actions of another") (Scholz & Tietje, 2002, p. 242; P. Wells & Nieuwenhuis, 2017). This supports interpretations of what is being verbalized and narrated through other forms of gathered data, "reconstruct[ing] the relation between the interviewees' verbalizations of the experience, and the experience of the phenomenon itself" (Antony, 2015, p. 149). By applying analytic autoethnography,

> *"autoethnographers are able to ask – in actu or ex post, tacitly or reflectively – whether certain general sociological concepts can adequately capture the specific practices experienced by them; performing diverse practices thus allows autoethnographers to establish the empirical reference of general sociological concepts (e.g. primary experience or tacit knowledge)"* (Antony, 2015, p. 154)

Accordingly, I sought involvement in the research subject by building a layered account of personal experience alongside the other forms of data gathering. In this way, analytic autoethnography provided me with a deep contextual understanding to better interpret and navigate primary data and secondary data by creating shared experiences, expertise, and relationships. Table 2.9 gives an overview of the types of actions that I enacted and captured through analytic autoethnography. The different events ranged from 4 to 8 hours, often requiring off-site preparation.

Table 2.9: Activities of autoethnographic research

Field of action	Description	Number of events (duration in h)
Brewing Competitions	Structured sensory training.	2 (4h)
	Beer judging at competitions.	5 (8h)
	Participation in competitions.	8 (2)
Homebrewing	Small scale brewing of different beer styles.	35 (8h)
Homebrew club participation	Regular participation in meetings.	19 (3h)
	Co-organization of educational and charity events.	11 (3h)
Collaboration brews	Brewing alongside professional brewers on the brewery premise.	1 (6h)
Public events	Participation in events hosted by a brewery or involving one or more breweries.	19 (3h)
Discussion and forum participation	Sharing and developing of brewing insights through writing and in-person discussion about technics as well as the political aspects of brewing.	Numerous

2.2.1.4 Secondary documentation

Secondary data refers to already existing documentation, which I mobilized for this research to complement the analyses of primary data (Johnson & Turner, 2003). Acknowledging that learning processes are often technology-mediated, I identified relevant media through primary data sources to capture the unit of analysis in yet another way (Murthy, 2008). The selected sources of secondary data included written accounts, audio recordings, and social media posts. Given the complementary purpose, the sourced documentation was selected and drawn on to extend and further elaborate on the collected primary data. I gathered documentation in three different areas: technical conversations, identity and representation as well as industry discussions. Table 2.10 describes each area and lists all relevant forms of documentation.

Table 2.10: Overview of different areas of secondary data

Area	Description	Forms of secondary documentation
Technical procedures	Captures brewing specific documentation that illustrates how brewers approach the craft, their perspective on practical procedures, and how and what forms of knowledge are shared.	• Audio and video podcasts episodes • Photos and videos
Identity and representation	Captures brewery specific documentation that a brewery release about themselves regularly.	• Websites of selected breweries • Audio and video podcasts episodes • Photos and videos
Industry trends	Captures statements and judgments about industry developments.	• Audio and video podcasts episodes

Snowball sampling supported the identification of secondary documentation. This required me to starting from a small iteratively complied set of sources while adding and removing relevant

documentation based on suggestions and cross-references (Spence et al., 2016). Through this procedure, I gathered material on three different forms of secondary documentation, including written accounts, audio and video recordings as well as photo and video recordings (see Table 2.11).

Table 2.11: Overview of different types of secondary data

Type of data	Description	Number
Written accounts	Websites of breweries	29
Podcast episodes	Audio and video recordings	352
Photo and video recordings	Instagram accounts of analyzed breweries in each case study covering released images between April 2018 and June 2019	6,104

Written accounts include self-published accounts of analyzed organizations (Ness, 2018). This data informed brewery selection and supported the primary data gathering through interviews. In total, 29 websites were gathered in early 2018.

Podcast episodes capture conversations among practitioners and experts through audio and video recordings (Kinkaid, Brain, & Senanayake, 2019; Murthy, 2008). The inclusion of such nonfiction audio series allows for the observation of discussions among experts about technical challenges, practices, and approaches. It also creates opportunities for me to examine aspects of collaboration between different breweries that may not be subject to the conversation yet being expressed by it (for example, collaboration can be displayed by two of more brewers collectively discussing technical processes and sharing insights into how intended results can be achieved without making this collaboration the subject of the conversation). I reviewed the identified podcasts for relevant episodes by screening the title and accompanying descriptions. In total, 14 podcasts and 352 episodes published between 2010 and 2019 were included, accumulating to 309 hours of relevant material. I used this material to complement and guide primary data selection and analysis. In some instances, breweries that I interviewed through this research also appeared on the included podcasts, which offered another avenue of data triangulation.

To examine visual depictions of the unit of analysis, I gathered secondary data from the Instagram accounts of 27 breweries that were part of the two case studies included in the analysis (Zappavigna, 2016). Instagram is a mobile application that allows users to share photos and videos, and thus, is in contrast to text-based applications "sensory-specific because it is linked to the visual modality" (Pittman & Reich, 2016, p. 157). Although the application did not enjoy equal popularity in both case studies, it enabled access to "rich layers of meanings," which further aided my efforts in exploring the

unit of analysis (Utekhin, 2017, p. 185). In total, I considered 6,104 images in this research, which were published between April 2018 and June 2019 (see Table 2.12 for a list of analyzed social media accounts and Appendix B for an overview of the analyzed podcast episodes).

Table 2.12: List of analyzed social media accounts

Account #	Number of photo and video posts	Location
1	237	Canada
2	375	Canada
3	90	Canada
4	346	Canada
5	332	Canada
6	152	Canada
7	96	Canada
8	474	Canada
9	220	Canada
10	142	Canada
11	368	Canada
12	499	Canada
13	303	Canada
14	361	Canada
15	751	Canada
16	27	Germany
17	3	Germany
18	29	Germany
19	135	Germany
20	17	Germany
21	235	Germany
22	63	Germany
23	337	Germany
24	29	Germany
25	10	Germany
26	308	Germany
27	165	Germany
Total	6,104	

2.2.2 Knowledge processing and methods of analysis

The knowledge generated through the methods of inquiry was processed to create field notes, thick descriptions, and transcripts to allow for thematic analysis, analytic induction, and qualitative content analysis.

2.2.2.1 Fieldnotes

Fieldnotes include notes taken in the field as well as based on memory, ex-post reflection sparked by external inputs such as conversations, readings, and pondering on gathered material and insights generated through methods of inquiry (LeCompte & Schensul, 2013). I structured my note-taking around themes and questions that guided this research in exploring the unit of analysis. Often, this involved writing and rewriting about experiences and observations and revising notes to translate initial (cryptic) descriptions into concise reflections (see Figure 2.1).
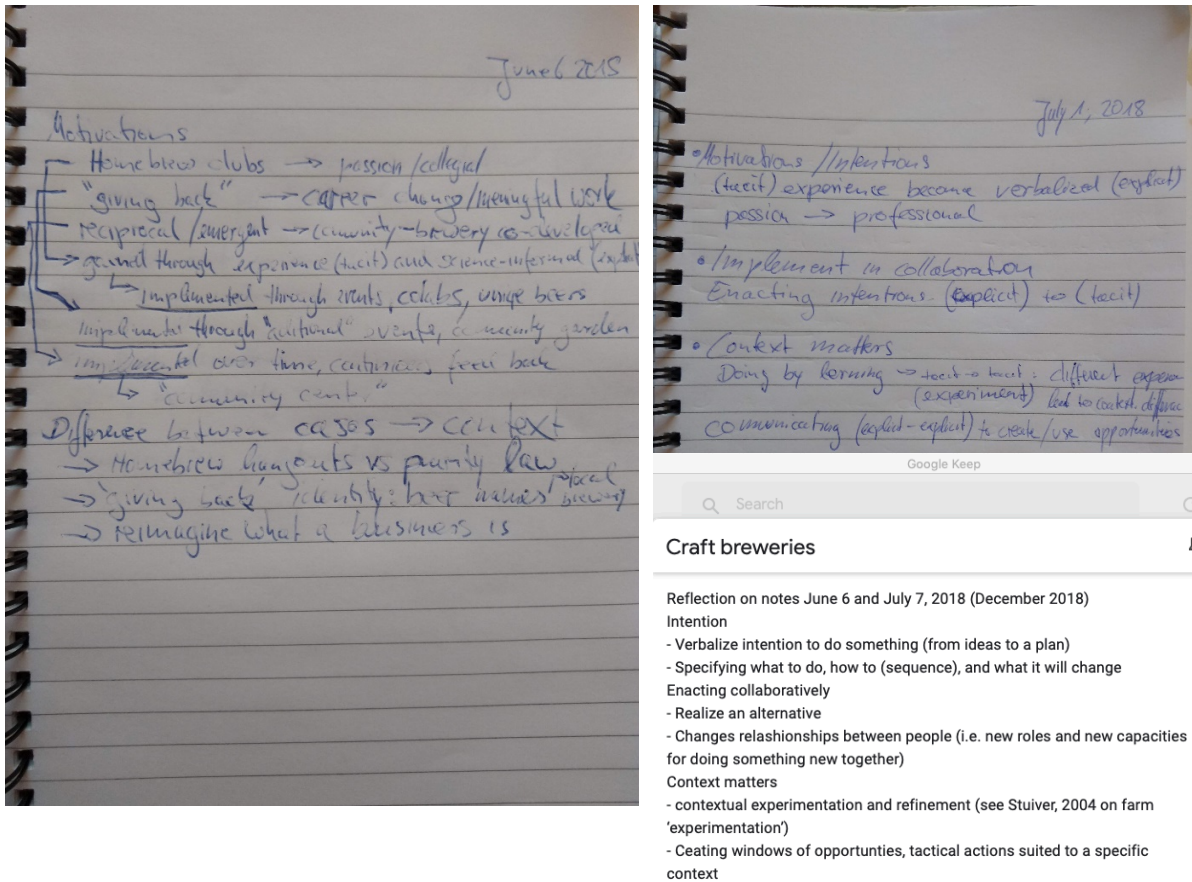
Figure 2.1: Exemplary field notes (from June, July and December 2018)

2.2.2.2 Thick descriptions

Thick descriptions serve as a method to create a detailed description of general patterns of social interactions and situations based on gathered material (Geertz, 1973). Generally, thick descriptions deal with people's intentions, behavior, and action that are enacted in a specific context and detail the knowledge processes supporting them (ibid). By producing thick descriptions, I aimed to capture experiences of particular situations at a level of detail that allowed translation of otherwise not readily articulated knowledge forms, recreating a given situation in writing (Denzin, 2001) (for an example, see Table 2.13). Detailed descriptions focus primarily on what people did in a relevant situation, along with the objectives of people's actions and interactions that guided how people acted and interacted. I complied thick descriptions for specific experiences during this research as well as for analyzing the entrepreneurial journey of the studied businesses.

Table 2.13: Example of a thick description to capture a specific situation

When I arrived at the brewery, it seemed a busy day for them. One of the workers waved to me as he was walking by to serve one of the customers. I stood by the side, waiting until he got a moment to chat. On his way back, he stopped to say hello. I mentioned that I would need to clarify a few details for the upcoming homebrew day. We started to discuss and exchange who from the group had signed up and what kind of brewing systems people would be using. I mentioned the previously discussed idea to use this event to organize a 'tap takeover' at the brewery, which shifted the focus to scheduling and fermentation times as well as the logistics of how many beers we would allow into the event without alienating anyone. He raised the concern of how we would ensure that high-quality beers would be served to the public and what kind of ways we could find to limit the 'tap takeovers' to those examples that would offer a pleasant experience to customers. To finalize details, we walked into the back of the brewery to consult with a co-worker and the owner who were busy moving skids of cans and glass bottles around. As we started to discuss options for organizing the 'tap take over' the co-worker suggested to move the event out of the brewery to differentiate between the brewery and the homebrew that would be served. The owner maneuvered a skid passed me, as he mentioned that this would limit us to six beers because of the availability of jockey boxes. I offered up the clubs' jockey box if need be to not exclude someone from entering their beer. Having solved the set-up of the event, we moved on trying to find a suitable date that would work for the brewery and would not conflict with other club events. This resulted in chit-chatting about who would be busy at what date and how it would not matter if they would not attend. I pulled my phone out to double-check the club events, and one of the workers was doing the same to confirm availabilities on their end. The initial dates that both of us proposed didn't work for the club or the brewery team. Finally, we settled on a date six weeks after the homebrew day, although we also noted that this could pose a problem for hoppy beers but eventually agreed that participants could make it work. The co-worker suggested buying the beer off the homebrewers as the beer had to be sold at a specific price to comply with the brewery's license. I suggested donating the proceeds instead because a batch of beer on a homebrew system can be quite inexpensive, and the impact of donating the raised money would be more significant. We agreed to donate the money that we would raise through the tap takeover to a local charity in the name of the brewery and the club. We decided to reconnect at a later point after we both looked into potential charities. And with that, we parted ways.

2.2.2.3 Transcripts

In-depth semi-structured interviews were recorded and transcribed verbatim. In cases where the interview continued after the recording was stopped, I relied on fieldnotes to capture relevant aspects of the conversation. Initial reflections and domain summaries that emerged during the transcription process I also logged as fieldnotes. These summaries concern primarily the semantic level – what interviewees said in response to a question and how they referred to a given topic – including contradictory statements within or between interviews and case studies (Braun & Clarke, 2019b). One example of a semantic summary that I developed during the transcription of audio recordings was on the concept of competition (see Table 2.14). Domain summaries informed the development of the coding scheme (see content analysis).

Table 2.14: Example of a domain summary

Semantic theme	Paraphrased reports synthesized across interviews
Competition	We are in competition with every other brewery in town because we all are trying to sell beer.
	The surrounding breweries are not competition because they help us by introducing new people to craft beer; we couldn't be doing this without them.
	Brewery A, B, and C are not competition because they have a different focus in comparison to us. They produce different beer styles, serve a different neighborhood, and cater to a different community.
	It is excellent that brewery D opened, now we have another brewery that we can recommend to our customers.
	Brewery F is not competition because we helped them at the beginning showing them how we do things and let them borrow our equipment.
	All of us craft breweries are in competition with large beer companies because every year people drink less beer so we can only grow if the big guys lose market share.
	We have not reached market saturation here; there is still space for new craft breweries to open. People thought we reached market saturation before we opened, but every new craft brewery is helping to create awareness.
	We are not in competition with large breweries because of the quantity that we produce in a year they produce in days/weeks. We are insignificant.
	We are not competing with large breweries because they have a very different focus. We couldn't be doing what they are doing.
	Competition is an old view of doing business. We do not have competitors. We have emotions. We like some people better than others.

2.2.2.4 Thematic analysis

Thematic analysis was applied to secondary documentation, including written accounts, podcast episodes as well as photo and video content. The purpose of such analysis is to identify underlying patterns in the selected material (Braun & Clarke, 2019b). Whereas qualitative content analysis captures semantic statements (i.e., what research participants say) as text chunks are assigned to codes, thematic analysis focuses on shared meanings across disparate data sources and context. Such meanings may include implicit sentiments and ideas as well as shared understanding and collective action that emerge from small independent activities. Accordingly, thematic analysis is not a succinct summary of the gathered material, but rather a generative and reflexive approach to the analysis of qualitative data (Braun & Clarke, 2019b; Vaismoradi, Turunen, & Bondas, 2013). For this purpose, I created a repository of the gathered or referenced material, which I iteratively analyzed to develop and refine latent codes and synthesize notes and reflections to develop preliminary labels. In a subsequent step, I tested these labels for appropriateness against the gathered material and substantiated, abstracted, refined, and adjusted or discarded them as I deemed necessary. Themes created through this process were organized through thematic maps to develop overarching stories of the analyzed documentation. Figure 2.2 shows the thematic map for the organizing themes on 'narratives' among craft breweries, illustrating relationships and interdependencies between underlying patterns. For example, early on in the analysis, the theme 'community engagement'

emerged, which I revised into 'purposeful engagement with communities,' reflecting relationships within a brewery, with its local community as well as with its peer-to-peer-community (i.e., industry). Generated themes also complemented the content analysis with themes being translated into codes and subsequently used to identify relevant points of reference in the primary and secondary material.

Passion as purpose

Story telling as meaning making

Collaboration as means for differentiation

Purposeful engagement with communities

Changing the conversation and societies relationship with beer
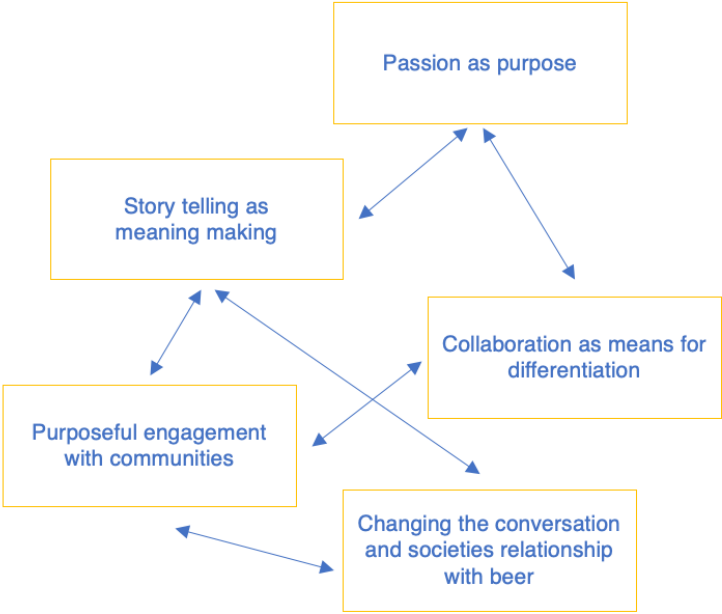
Figure 2.2: Thematic map of preliminary themes on narratives

2.2.2.5 Analytic induction

Analytic induction was applied to primary data analysis. It required an iterative procedure involving data gathering, analysis as well as developing and summarizing insights to guide the iteration of this process (Bansal & Roth, 2000; Martin Hammersley, 2011). For the first iteration, I coded gathered material through qualitative content analysis (Elo & Kyngäs, 2008) according to the categories derived from the literature to identify relevant descriptive activities. This step also allowed to contextualize the generic categories that were derived from the literature and identify where supporting data was insufficient to determine contextual applicability. The resulting insights informed the next iteration of primary data collection. Also, I followed suggestions from key informants to other (secondary) data sources (e.g., websites and social media) to complement the previous step as well as I used initial analytical reflections to inform the next iteration. The third iteration focused on completing and adjusting the identified material across the literature-based categories. The analysis shifted toward examining categorial variability to inductively identify new analytical subcategories to

better discriminate between activities that constitute the unit of analysis. For this, I compared all activities within a category against each other to identify analytical groupings and define subcategories based on shared purpose and activities. This generated more nuanced descriptions of category content through subcategories (Elo & Kyngäs, 2008). Lastly, I improved the consistency and accuracy of subcategories through iteratively analyzing all gathered material and modified, reformulated, merged, and separated definitions.

2.2.2.6 Content analysis

Qualitative content analysis was applied to analyze the gathered primary material, including transcripts, fieldnotes, and thick descriptions. The purpose of content analysis is to identify and extract relevant text from selected material following a rule-based categorization procedure to generate board, but condensed characterizations of, and organize the investigated phenomenon (Elo & Kyngäs, 2008; Mayring & Fenzl, 2019). For this purpose, I developed a coding scheme by combining deductive analysis – to operationalize previous research – and inductive analysis – to combine and draw on specific instances found in the analyzed material for developing broad descriptions of observed activities. This process included formulating of categories and subcategories based on 1) literature, 2) themes generated through thematic analysis, 3) domain summaries, and 4) open codes that captured relevant, but uncategorized text passages (Elo & Kyngäs, 2008; Mayring, 2000).

To organize the material and develop a nuanced understanding of the unit of analysis, I developed codes through deductive analysis and inductive analysis. Deductive codes were developed based on previous research on organizational change, business innovations, business sustainability, and socio-technical systems research. The goal was to derive categories that were as broad as necessary and precise as possible to allow for consistent use. Application of derived categories was complemented by inductive analysis, including theme-based coding derived from thematic analysis, domain summary-based coding developed through the transcription process (see above), and open coding. The inductive analysis helped to identify relevant text passages that were not captured through categories derived from previous research as well as specifying predeveloped categories through the process of formulating subcategories (see subcategory column in Appendix C). For example, the code on collaboration was identified through open coding and substantiated through theme-based coding by analyzing primary and secondary material for relevant instances to complement initial definitions (e.g., compare category 'collaboration as means for differentiation' and collaboration' as well as see the respective subcategories). Finally, domain summary-based coding guided the search for additional

relevant instances which were subsequently extracted and translated into categories and coding rules (see, for example, category 'competition'). Appendix C provides an overview of the developed categories, definitions, references, subcategories, specifications, and coding rules.

Consistency and accuracy of categories and subcategories were improved through iteratively analyzing all gathered material and modifying, reformulating, merging, and separating definitions. The application of categories and subcategories to the collected material was not mutually exclusive. To consistently attribute identified text chunks to relevant codes, the gathered material was imported to and analyzed using NVivo where appropriate.

2.2.3 Trustworthiness as a quality criterion of this research

In line with the interpretive research approach and the explorative nature of this thesis, the presented work aims to adhere to the quality criterion of trustworthiness. This quality criterion focuses attention on the question of "how can an inquirer persuade his or her audiences (including self) that the findings of an inquiry are worth paying attention to" (Lincoln & Guba, 1985, p. 290). Activities that aim at ensuring the credibility of this research include prolonged engagement, triangulation, peer debriefing, and member checking.

2.2.3.1 Prolonged engagement

Throughout the research, I ensured prolonged engagement by conducting multiple site visits in 2018 and 2019, interacting with the subject area on a regular basis, and developing intimate familiarity with both research contexts. First, access to the Canadian case study was ensured by the fact that I lived in close proximity throughout this research. Field visits to the German case study were conducted in 2018 (four visits) and one in 2019, each lasting one week. As outlined in the description above, the conducted research ensured full immersion in the subject area through autoethnography and secondary data gathering. Both approaches supported me in conducting interviews by establishing rapport with the participants base on shared experiences related to the subject area. Finally, I lived in both case study regions for multiple years, which helped to navigate local specifics (e.g., language, dialects, logistics, reputation of neighborhoods, etc.) as well as supported a nuanced understanding of the significance of the engaged businesses in the respective context.

2.2.3.2 Triangulation

Triangulation ensured that the research analysis built on a diverse set of primary and secondary data (Baxter & Jack, 2008). This allowed me to investigate the research subject from multiple perspectives. Among others, it included statements by the research participants (interviews), observed behavior in mundane settings (participant observations), my intimate experience with the research context (analytic autoethnography), and publicly accessible documentation produced by research participants and third-party organization (secondary documentation). This enabled me to cross-check observations across different data sources. For example, statements made by the research participants that their business functioned as a community hub were cross-checked with the subjective experience of the researcher, observations of customers and community members behavior in respective spaces, analysis of statements made by members of the same business on podcasts, and appraisal of photographic evidence of relevant activities published by the respective business over an extended time period. Triangulation also revealed additional details and nuances of described activities and helped to build a more fulsome understanding of the research subject.

2.2.3.3 Peer debriefing

Peer debriefing aims at ensuring the involvement of other researchers in "extensive discussions about the findings and progress of an investigation" (Spall, 1998, p. 280). It included my participation and presentation of this research at the week-long Innovation and Sustainability Transition Summer School hosted by School of Business and Economics at the UiT The Arctic University of Norway in Norway in 2018. I also participated and presented my research at a two-day workshop on craft brewing in Italy in 2018, which leading researchers in the field of beer economics and geography in organized in collaboration with The Gran Sasso Science Institute (GSSI) and the Regional Science Association International (RSAI). Moreover, I presented part of my doctoral research at the International Sustainability Transitions Conference in 2018 and 2019, the Canadian Society for Ecological Economics Conference in 2019, and the Beyond Business as Usual conference in 2019. Two of these conference presentations were cohosted with a total of three craft breweries that were actively involved in designing, preparing, and presenting insights from this research as part of the presentation. I also participated in an in-depth workshop on ethnographic methods and data analysis to ensure the credibility of findings and interpretations. Finally, this research benefited from regular consultation with my PhD advisory committee on the substantive and procedural aspects of this study.

2.2.3.4 Member checking

Lastly, member checking involved the solicitation of feedback from research participating and industry experts (Birt, Scott, Cavers, Campbell, & Walter, 2016). First, to more accurately represent research participants' experiences and enable the co-construction of findings, I conducted informal testing of findings with research participants. Facilitated through *at hoc* discussions when interacting with participants after the initial interview, this helped, for example, to improve conceptions of different levels of competition in the industry (see also Table 2.14). Also, I organized two formal meetings to present some of the findings (i.e., conception of knowledge flows and entrepreneurial journeys) to research participants in 2019 and 2020. Also, industry experts that did not participate in this research were engaged through a conference presentation at the international Master Brewers Conference in Canada in 2019.

2.2.4 Research limitation and the researcher's positionality

The methodology that I presented in this section has limitations that are both general, as they pertain to the research design, and specific, as they concern my positionality in this process. As outlined above, the goal of this research was to "provide thick, detailed descriptions of actual actions in real-life contexts that recover and preserve the actual meanings that actors ascribe to these actions and settings" (Gephart, 2004, p. 455). Accordingly, this research did not aim to discover facts about the 'true' reality to scrutinize the validity of hypotheses or reveal contradictions and hidden interests in social arrangements. Therefore, the presented findings cannot be generalized beyond this research and the studied cases; nor do the findings offer a definite or exhaustive account of all meanings present in the cases.

The outlined methodology is also subject to more specific limitations related to my positionality and active role in navigating the research process. My intimate knowledge of the two case studies, which I purposefully selected, significantly influenced how I engaged and navigated the respective contexts and what circumstances I deemed interesting. The intimate understanding that I have developed about both cases emerged from the experiences I gained through living in both contexts for multiple years. I assume that this has helped me to better understand certain cultural aspects around beer and brewing in both settings (e.g., the influence of prohibition on the Canadian context and the relevance of the purity law for the German context). Yet, I gained such experiences without the benefit of a purposefully guided process. Therefore, becoming aware and utilizing these experiences were subject to my intentional reflection, which is an ongoing and incomplete process.

During this research, my place of residence coincided with the geographical location of the Canadian case study, and due to the resulting geographical distance to the German case, my investigation into the examined phenomenon differed significantly between the two. For example, site visits to the German case were limited to a few occasions (see Section 2.2.3.1). These circumstances have impeded my efforts to build relationships of similar quality and engage with German breweries in ways comparable to my involvement with the Canadian case study. Due to my involvement in the Canadian case (for example, most of the activities listed in Table 2.9 were conducted in Canada), I may have gained access to insights and action contexts that are uniquely related to my positionality. While noticing these implications, I can only speculate that I may or may not present the meanings that German participants ascribe to their actions differently in comparison to the meanings that Canadian participants associated with their actions. However, this binary differentiation between the cases distorts the variance within each case and may very well not resonate with the interviewees' experience in either context. For example, some interviewees immigrated or moved to the respective case study. Therefore, despite their place of residence, it is important to acknowledge that each participant is characterized by their positionality that cannot be removed from their actions. When drafting the different chapters of this thesis, I found it to be helpful for my writing to actively remind myself, think about and reflect upon the various businesses that I engaged through this research and with them, the respective individuals. This strategy brought to life vivid experiences that I have gained through this research against which I reflected upon for my writing to inquire about the research participants' perspective on the issue in question. The field notes and thick descriptions I complied throughout this research offered helpful guidance for this process (see Figure 2.1 and Table 2.1).

It is also important to state that the brewing industry, in general, is considered to be a male profession (Tak, Correll, & Soule, 2019). Also, craft breweries in both contexts were predominantly, yet not exclusively, operated by white males, which reflects my identity, and this sameness may have created comfort for some of the participants. These circumstances may have made me 'blind' to comprehend actions and associated meanings incompatible with my identity. Some of the research participants reflected during the interview upon the lack of diversity in the industry and signaled support for or mentioned initiatives that they supported to bring a voice to minorities. The women, person of color, and second language speakers that I interviewed did not mention instances where they felt excluded from knowledge sharing actives that I examined through this research. However, I did not explicitly ask for these instances or sought to interview minorities. Instead, in all interviews, I

explored aspects of intra-organizational collaborations for which the underrepresented individuals that I interviewed offered various examples that were referenced in similar ways by the other interviewees.

In combination with my immersion in the research context (see Section 2.2.1.3), my positionality also influenced my relatedness to research participants in significant ways. For example, I was able to create experiences through which I could relate to the different participants, which all had in common a passion for the research topic. My ability to engage in technical discussions over the advantages, disadvantages, and best practices of specific brewing procedures may have also increased participants' willingness to engage in conversation related to my interview questions. This made the interactions and the research process enjoyable as I was able to signal compassion through the use of specific terminology and jargon, which helped me to allude to presumably shared experience in conversation.

My biography may have also been influenced the communication with research participants at different and potentially unnoticed levels (e.g., verbal, physical, emotional, etc.). My interactions with research participants and how I made sense of them were mediated by my German ethnic identity and place of residence in Canada. First, I experienced language barriers in both contexts. In the Canadian case, because English is not my first language, it is possible that linguistic nuances that the interviewees expressed were lost by me in the analysis of the Canadian case material. As I was more interested in border analytical themes and through the use of direct quotations of interviewees' statements, I hope that I addressed these limitations sufficiently. In the German case, I noticed that I was not fluent in German brewing terminology, which required me to do some quick learning after the first interviews to address this observation. Second, my ethnic identity may have also influenced my interactions with research participants in another subtle way. Here, it is crucial to consider that the German brewing tradition has shaped the Canadian context (Lamertz et al., 2016), and more recently, North American craft brewing has started to transform the German brewing sector (Schricker, 2016). In relation to this, my positionality may have been laden with the notion of perceived opinion leadership. While some research participants in the Canadian case may have assumed that I held insider knowledge of German brewing tradition – be it related to brewing processes, beer styles, or culture – participants in the German case may have presupposed my intimate knowledge of new trends and intimate understanding of the craft brewing movement in North America. Whenever I noticed such stereotypical reckoning, I tried to emphasize nuances and offered my sometimes-

contradicting personal experiences. These experiences also made me more aware of some of my own assumptions, and I have curiously explored how they materialized throughout this research.

Chapter 3

The Role of Metanarratives and Sensemaking in Narrating Change for Sustainability

Abstract

Narratives are central to the organization and transformation of society due to their ability to maintain stability and promote change. This dual ability is realized by metanarratives as they articulate and reiterate the organizing principles that underpin social arrangements and shape the development of related storylines. Narratives can also be mobilized to justify and legitimize change processes through sensemaking that articulates alternative perspectives and verbalizes new realities into existence. However, previous research has not explicitly examined the reciprocal interdependence of these processes, and a nuanced understanding of how new narratives are constructed by and among organizations is still missing. Responding to this gap, this research empirically explores how small businesses draw on organizing principles for making sense of their attempt to transform industrialized production and consumption systems into more sustainable versions. The examined industry transformations in the brewing sector in Canada and Germany show how metanarratives shape these processes by making tacitly held understandings explicit in language, externalizing alternative organizing principles around 'the art of making' and 'cooperation as a means to prosper.' The case studies illustrate how studied small businesses creatively draw on these organizing principles to make sense of new action contexts in a way that challenges industrial and competitive industry arrangements; these alternative metanarratives support small businesses to create new meaning categories around 'aesthetics' and 'affective work' (i.e., creating and managing emotions), and establish a 'collaborative ethos' as well as 'relational identities.' This research demonstrates that the constructed narratives of change that guide industry transformations toward sustainability do not emerge in a vacuum and that both alternative organizing principles of metanarratives and the sensemaking of actors are mutually dependent.

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3.1 Introduction

Narratives have gained increased attention in research on the organization and transformation of society due to their ability to maintain stability and promote change (Vaara et al., 2016; Wittmayer et al., 2019). Narratives, in this context, are linguistic, constitutive descriptions of events and phenomena that provide sequential ordering and give meaning to the actions of actors in ways that – despite not always being explicit or fully developed accounts – can reproduce a set of values, beliefs, and practices which may invigorate change or reconstruct the status quo (Vaara et al., 2016). Narratives can be mobilized for maintaining the status quo and restraining variability through the use of so-called metanarratives – grand narratives that provide an interpretative framework for actors to make sense of novelty based on core assumptions that inform value judgments (i.e., organizing principles). As actors draw on metanarratives and their organizing principles that speak to established beliefs and values, they form understandings of new situations based on existing categories of reference, which thus provokes a response consistent with conventional practices (Garud et al., 2011; Schildt et al., 2020; Vaara et al., 2016). As a discursive construction, narratives can also be mobilized for instigating change processes. Here, narratives become the means through which individual and collective sensemaking is verbalized as actors encounter new possibilities through action which may prompt them to change existing frameworks to "understand the future in ways consistent with their redefined reality" (De Rond et al., 2019; Maitlis & Christianson, 2014, p. 90; Weick et al., 2005).

   Changing contemporary narratives that guide small business actors and orient their activities may offer significant opportunities for generating profound change in support of sustainability (Campbell et al., 2019; Forssell & Lankoski, 2018; van der Leeuw, 2019). Previous research has demonstrated the pivotal role of narratives for constructing organizational identity, devising business strategy, encouraging entrepreneurship, and guiding transformational change of organizations (Dalpiaz & Di Stefano, 2018; Vaara et al., 2016). Yet, addressing grand challenges such as climate change and the decarbonization of the economy requires fundamental transformations of the current way society is organized, which starts with the narratives that guide action (Campbell et al., 2019; Etzion et al., 2017). Such narratives require new framings to justify the kind of activities and goals that empower actors to engage in 'new ways of doing' and contribute to environmentally sound, socially just, and economically prosperous ways to organize society (Blythe et al., 2018; van der Leeuw, 2019). For example, a society geared toward nature preservation, active mobility, and organic food production would require accompanying narratives that elevate these collective actions to compelling goals that

actors are eager to engage in and support. Constructing new narratives relies on the sensemaking of individual actors – the active process through which they encounter and understand new situations (Maitlis & Christianson, 2014). Yet, the ability of actors to collectively create narratives of change that construct storylines of sustainability transformations is not well understood (Wittmayer et al., 2019). Previous research has not explicitly examined the reciprocal interdependence of these processes "to better understand how new narratives are created and how individual actors or broader communities engage with this emerging narrative to mobilize for change" (Vaara et al., 2016, p. 548).

This research response to this gap by empirically examining how small businesses employ and construct narratives of change in their attempt to transform industrialized production and consumption systems toward sustainability. The focus of this research is on the action contexts in which businesses engage in sensemaking, how metanarratives inform this process, and how the created new meaning categories enable narratives of change to form alternative organizing principles. By following a qualitative case study research design, I explore these aspects in relation to craft breweries – businesses that are small in size, independently operated, and inspired by non-industrial production methods. Based on primary and secondary data, this research illustrates how small business in Canada and Germany draw on alternative organizing principles that have emerged with the "craft beer revolution" in the United States (Garavaglia & Swinnen, 2018b, p. 3) to make sense of novel action contexts and create new meaning categories to discursively construct new industry realities that guide and accelerate this movement.

This article offers an empirical demonstration of how small businesses collectively create meaning for pursuing new ways of doing while contributing to sustainability transformations. This research illustrates how small businesses develop narratives of change to generate meaningful accounts for purposeful action. The findings have broader implications for research on how narratives can foster transformations toward sustainability: First, they call attention to the ability of individuals and collectives to creatively align and realign narratives of change with their actor roles to construct future visions that are advantageous to their realities. Second, this research details the role that alternative organizing principles play in emancipating otherwise overlooked actors to express new value systems and discursively construct change for sustainability. These insights offer new avenues for future research to examine the interdependencies between metanarratives and sensemaking in the process of narrating change for sustainability.

In the next section, I review the conceptual considerations for understanding the dual ability of narratives and how sensemaking and organizing principles are at work in transforming social arrangements or maintain the status quo. After describing the methods, Section 3.4 presents and discusses how small businesses mobilize organizing principles such as 'the art of making' and 'cooperation as a means to prosper' to make sense in new action contexts that challenge industrial and competitive industry arrangements and generate new meaning for narratives of change. In conclusion, I reflect on opportunities to mobilize narratives in support of organizational change for sustainability.

3.2 Narratives of change between sensemaking and metanarratives

Narratives of change guide actors and their actions to support sustainability transformations as such stories narrate how to achieve a desired future state through a specific course of action (Luederitz et al., 2017; Wittmayer et al., 2019). Narratives situate and order the sequence of actors and their action temporally in relation to an imagined future (Ricoeur, 1984; van der Leeuw, 2019) while representing a specific way of knowing reality that is socially negotiated between individuals and collectives (Blumer, 1969; Dailey & Browning, 2014). Narratives of change emerge from sensemaking of individuals and collectives in action contexts where novelty becomes intelligible by way of communication that verbalizes a situation into existence, making it comprehensible by others and building the bases for its meaningful engagement (Weick et al., 2005). Yet, more often than not, the need for sensemaking is limited as narratives are sensegiving devices (Vaara et al., 2016). Actors readily comprehend a situation by relying on so-called metanarratives that exist outside of particular action-contexts and provide individuals and collectives with "taken-for-granted categories and organizing principles by which they select and implement courses of action" (de Clercq & Voronov, 2011, p. 324). These considerations point to the key challenge "of how locally situated narrating can bring about any liberation and emancipation from dominant" metanarratives (Herman, Jahn, & Ryan, 2005, p. 288). The following sections explore this tension by focusing on the role of sensemaking (Section 3.2.1) and metanarratives (Section 3.2.2) in change.

3.2.1 Sensemaking generates alternative narratives for promoting change

Sensemaking describes the social process through which actors decipher clues about new instances through actively "constructing the very situations they attempt to comprehend" to inform action (Maitlis & Christianson, 2014, p. 50). For example, Fritz Maytag who bought Anchor Steam – an old, economically struggling brewery – founded the first craft brewery in 1965 as a small, local business

in an industry where only large corporation operate successfully, which required him to construct the company's character as he started operation and to constantly redraft the initial story to better describe the business identity and core activities (Acitelli, 2013). Comparing it to interpretation, Weick (1995, p. 13) states that "sensemaking is about the ways people generate what they interpret." Accordingly, sensemaking is an active process that requires "reflection-in-action" as actors engage in an action context in which a novel situation is encountered and realities are constructed (A. D. Brown et al., 2015; Schön, 1983, p. 50). Sensemaking is a retrospective activity to the extent that actors generate a plausible understanding of a situation through dialogue and narration that gives birth to salient categories which in turn unearths new meanings and observations (A. D. Brown et al., 2015; Cornelissen, 2012; Schildt et al., 2020).

Sensemaking is the "primary site where meanings materialize" through articulating experience and composing narratives that bring order into the experienced (novel) situation (Weick et al., 2005, p. 404). Here, narratives bring to life people's personal experiences and interpretations thereof, through articulating perspective on, arrangements of, and the context in which actors (inter)act (Maitlis & Christianson, 2014). They help people to align their experiential foundations of social life with the situation in which they are embedded (Garud et al., 2011; Schiff, 2012; Weick et al., 2005). For example, the first craft brewery – Anchor Steam – contrary to conventional practices at the time did neither package nor distributed its product, did not have the means to rely on marketing for advertisement, and kept to traditional production methods albeit being considered uneconomic. Fritz Maytag's goal with Anchor Steam was simply to produce "a product locally for local consumption", which required a new narrative to make sense of these experiences and give rise to a new reality (Acitelli, 2013, ch. 1). If the personal experience and the contextual realities have grown apart to the extent where alignment is unattainable, sensemaking enables actors to mobilize narratives of change in support of new justifications to legitimize configurations that are more suitable to the imaginary future of a specific group of actors (Schildt et al., 2020; van der Leeuw, 2019). In this way, sensemaking supports narratives of change as actors can foreshadow the alternative, "sought-after society" within action contexts that otherwise would be marginalized by and subject to conventional narratives (Wittmayer et al., 2019, p. 2). Accordingly, sensemaking calls attention to the action context as a focal point out of which new narratives of change can emerge that may support sustainability transformations (see Figure 3.1).

3.2.2 Narratives externalize organizing principles of metanarratives that guide action

Narratives externalize and reconstruct organizing principles that guide action and constitute action contexts as they "reproduce dominant values and ideologies" (Vaara et al., 2016, pp. 448–449). In his seminal book on knowledge in a postmodern society, Lyotard (1984) illustrated this with the abstract concepts of freedom, reason, and the state, which operate as organizing principles in the metanarrative of scientific progress. Accordingly, these organizing principles are abstract notions that allude to collective beliefs rather than constituting stories of daily life (Herman et al., 2005). Metanarratives are recursive as the organizing principles that guide actors' understanding of a situation through established categories also shape the action context that enables sensemaking; therefore, a storyline conveys values and beliefs to the same extent to which they precede it (Robichaud, Giroux, & Taylor, 2004; K. Weber & Glynn, 2006). While the organizing principles that guide sensemaking and their reproduction have received less explicit attention in research on narratives (A. D. Brown et al., 2015; Vaara et al., 2016), they significantly shape how actors respond to novel situations and whether change is instigated or "business as usual" prevails (Wright & Nyberg, 2017, p. 1634). For example, the characteristics of the first craft brewery – Anchor Steam – gave rise to new organizing principles – small size operation, independent ownership, traditional production methods – that allowed newly founded breweries to deviate from what was at the time considered business as usual in the brewing industry (Acitelli, 2013). A "crucial element" of metanarratives are their organizing principles that enable actors to discriminate between interpretive frames to make sense out of the "limitless array of social experiences" as their "capacity to act depends to a great extent on having an evaluative framework […] a set of fundamental principles and values" (Béné et al., 2019; Somers, 1994, p. 617). More specifically, the belief systems that materialize through the organizing principles not only determine how an action context is perceived (Galbraith, Clark, & Benitez-Galbraith, 2016), but also their repetition through narratives shape whether a story is interpreted as illustrating change or advocating for the status quo (Dailey & Browning, 2014).

The pervasiveness of organizing principles has spurred investigations into various metanarratives (Lyotard, 1984). For example, narratives around economic development often externalize organizing principles of the metanarrative that concerns neoclassical economics by articulating, among others, economic growth as the primary objective (Longhurst, 2015). Yet, "economic growth is a gendered construct … from which emanates others such as the reinforcement of the entrepreneur's image as a man, the difference between male and female entrepreneurs, the focus on the individual and the

objectivist ontology" (H. Dean, Larsen, Ford, & Akram, 2019, pp. 25–26). These construct functions as an organizing principle and shapes, for instance, how researchers confront women's economic performance, which generates stories that further marginalize women and perpetuate inequalities.

Bringing these insights on sensemaking and narrative together suggests that narratives of change externalize principles that explicitly or implicitly challenge conventional logics and beliefs. This tension, in turn, begins to constitute new metanarratives. Narratives of change are positioned in relation to conventional storylines that function as "legitimisation strategies for the preservation of the status quo with regard to power relations and difference in general" (Beckert, 2016; Herman et al., 2005, p. 287; van der Leeuw, 2019). Thus, narratives have a series of critical roles: 1) they externalize organizing principles of metanarratives that, in turn, 2) shape sensemaking in action contexts, out of which 3) new narratives of change can be generated (Figure 2.1). Accordingly, narratives of change, to be identified as such, need to embrace and externalize fundamentally different principles than the ones that are embedded in conventional storylines in order to generate transformative change. However, narratives of change often emerge and multiply across contexts without central organization which emphasizes the agency of actors in drawing on organizing principles while simultaneously engage in sensemaking to unravel and generate meaning in a new action context (Cooren, 2010; Vaara et al., 2016; Wittmayer et al., 2019). Despite being conceptualized in the literature, this phenomenon of reciprocal interdependence between sensemaking and metanarratives lacks empirical examination, which impedes efforts to comprehensively understand the collective ability of actors to craft, negotiate, and mobilize new narratives for change. The next section reports on the methods to address this research gap and describes the selection of the craft brewery movement as an illustrative case for exploring the role of metanarratives and sensemaking in narrating change – specifically in this case, change for sustainability.
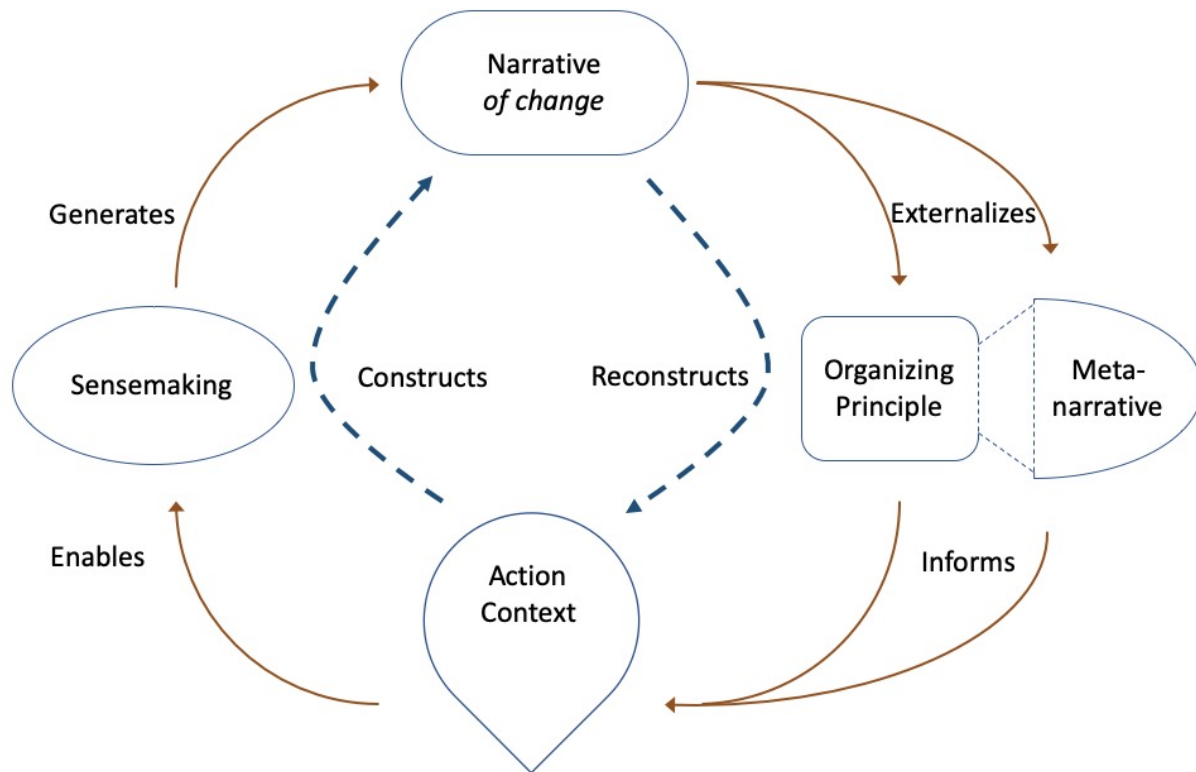
Figure 3.1: Stylized depiction of the relationship between narratives and action contexts
The blue (doted) arrows illustrate the bidirectional relationship between narratives of change and the action context: actors in action contexts generate new meaning (see sensemaking Section 3.2.1) and construct new narratives that externalize principles and inform new action (see Section 3.2.2). The brown arrows illustrate that conventional narratives externalize principles that may not be conducive to alternative arrangements as they reflect metanarratives and thus reconstruct actions that maintain the status quo.

3.3 Methods

This research empirically examines the action contexts in which craft breweries construct narratives of change as they engage in the sensemaking of novel activities and draw on organizing principles of metanarratives. Combining triangulated qualitative case study research with secondary data analysis, this research examines the actions through which craft breweries developed shared narratives of change. This approach was adopted to address the circumstance that "narratives are often spread without particular intentionality or deliberate action" by those that generate them; also actors appropriate them for making a situation meaningful for themselves (Vaara et al., 2016, p. 496; Wittmayer et al., 2019). These dynamics speak to the potential of narratives, as discussed in Section 3.2, to co-orient activities and the sensemaking of it (Cooren, 2010). Put differently, actors look for meaning "simultaneously upstream and downstream of the interaction without losing it" (Latour, 2010, p. xvi) when they do something "for another next first time" (Garfinkel, 2002 cited in Cooren

2010, p. 36). Triangulation between the case study research and secondary data analysis captures how the pre-existing organizing principles of metanarratives that are created outside of the research context inform sensemaking within the case studies.

3.3.1 Research context and selection of relevant cases

This research focuses on two local contexts, Canada and Germany, and examines how craft breweries in each context engage in narrative construction. Craft breweries, defined as small, independently owned businesses that are inspired by traditional brewing practices, have considerably disrupted the conventional arrangements in the brewing industry (Acitelli, 2013; Elzinga et al., 2015). Unlike conventional, industrial breweries, craft breweries offer a highly differentiated product without distributing it widely, do not rely on increased production capacity to utilize economies of scale, and also do not engage in extensive marketing to reach consumers (Acitelli, 2013; Cabras & Bamforth, 2016). As such, they defy the very success factors of longstanding incumbents in the brewing industry, which is primarily characterized by a "highly concentrated market structure [and] homogeneous output" which made for an unlikely context for new entrants to emerge (Datta, 2017; Elzinga et al., 2015, p. 243; Gammelgaard & Dörrenbächer, 2013).

Yet, the number of craft breweries has mushroomed in many countries during the last decades (Garavaglia & Swinnen, 2018a). For example, in the United States, their number increased from less than eight craft breweries in 1980 to over 7,400 in 2018, which collectively account for more than 13 percent of the industry's production volume and over 24 percent of retail dollar sales (Brewers Association, 2019; Elzinga et al., 2015; Garavaglia & Swinnen, 2017). Accompanying these trends are new narratives of change in which craft breweries emphasized new values, such as locally embedded production, collaboration among craft breweries, as well as diversity and inclusivity (J. Gatrell et al., 2018; Mathias et al., 2018). This has established a "moral landscape" of production, relating manufacturing to local heritage, and reconfiguring social practices of consumption (Fox Miller, 2017, p. 6; J. Gatrell et al., 2018).

Germany and Canada were chosen as a case study context because the two countries saw craft brewing emergence in significantly different conditions. One significant difference in Canada is a period of prohibition that occurred at the beginning of the 20th century which fundamentally shaped the brewing industry by enforcing restrictions on business possibilities, making it one of the most regulated food sectors in the country (Giesbrecht, 2017; Lamertz et al., 2016). In contrast, a major factor influencing the emergence of craft breweries in Germany was the nation's adoption in 1906 of

the *Reinheitsgebot* – a beer purity law that initially restricted brewing ingredients to barley, hops, yeast, and water – which led to relaxed regulations that promoted product quality and focused the country's public health approach on moderate consumption (Lam, 2014). The market concentration is very high in Canada, with the largest two internationally-owned beer corporations controlling over 50 percent of the market share (Couillard, 2019). Craft breweries, which were only permitted to open after 1984, account for 6 percent of the market (Lamertz et al., 2016; Weersink et al., 2018). Comparatively, Germany has maintained a fairly fragmented and regionally diversified market, with small breweries accounting for over 75 percent of the market (Depenbusch et al., 2018). Also, because of the continued existence of such business models, the craft brewing trend (where breweries use ingredients not permitted by the purity law and produce beer styles that are not considered traditional in Germany) has gained less traction with estimates suggesting that approximately 1 percent of the market share is accounted for by North American-inspired breweries (Drinktec, 2019).

In both contexts, craft breweries aspire to similar goals that mirror dynamics in the United States (see, for example, Elzinga et al., 2015; J. Gatrell et al., 2018) as they work on diversifying and pluralizing conventional arrangements and practices. Moreover, in both cases, craft breweries relied on each other to circumvent context and industry-specific challenges, similarly to dynamics in the US (see, for example, Acitelli, 2013; Mathias et al., 2018; Nilsson et al., 2018). Probably the most visible indication for this collegial attitude in both contexts is the existence of 'collaborative brewing initiatives,' which initially emerged in 2006 in the United States (Kraus et al., 2019). These initiatives center around partnership, with two or more craft breweries collaborating in the design, production, and distribution of a product.

3.3.2 Unit of analysis and selection

The unit of analysis is the action context in which breweries engage in sensemaking activities that give shape to subjective meaning and shared meaning systems (Goldkuhl, 2012; Guba & Lincoln, 1994; van der Leeuw, 2019). The analysis focused on daily activities to understand "mundane rather than crisis-led sensemaking," responding to a critical research gap in the literature (A. D. Brown et al., 2015, p. 272). Moreover, as shown in Section 3.2, understanding action contexts that enable sensemaking also requires capturing relevant organizing principles of metanarratives (Wittmayer et al., 2019). To examine how action contexts are shaped by organizing principles, the following two iterative steps were conducted.

In the first step, primary data was collected on relevant action contexts through interviews with key informants. In total, 30 semi-structured interviews were conducted in 2018 and 2019 with owners and employees of craft breweries and industry experts (see Appendix D). The interview script focused on 1) business structure and orientation, 2) learning, sourcing and application of knowledge, and 3) external relationships. The participant selection was informed by purposeful sampling to identify "information-rich cases" (Patton, 2015, p. 264). Also, participant and non-participant observation were carried at 36 occasions to investigate informal interaction at events and day-to-day operations (Kawulich, 2005; LeCompte & Schensul, 2013). Identification of respective situations was informed through interviews and secondary data analysis.

In the second step, secondary data was collected to complement and inform step one. This included the scanning of 29 brewery websites and the collection of 6,104 photographs from social media accounts of breweries to capture self-published, visual depictions of action contexts. Photographs are particularly useful as they "offer a snapshot in time that momentarily freezes a phenomenon, process or practice," which may not be accessible to primary data collection or encompasses insights that cannot be readily verbalized (Vaara et al., 2016, p. 551). Also, 246 episodes from nine United States-based podcasts were identified for distilling organizing principles of existing metanarratives that would be of relevance in the analyzed context (see Appendix E). Including nonfiction podcasts allowed for observing discussions among experts about technical challenges, practices, and approaches. As the target audience of these podcasts is practitioners, this data allowed to identify organizing principles that are not necessarily articulated through a conversation yet are expressed by it (for example, collaboration can be displayed by two of more brewers collectively discussing technical processes involved in achieving a given result in different breweries without making this collaboration the subject of the conversation). The selection of relevant podcasts was informed by interviews and snowball sampling that started from a small iteratively compiled collection while adding and removing sources based on suggestions and cross-references (Spence et al., 2016).

Organizing principles (second order theme) | **Codes** | **Definition** | **Explanatory coding (action contexts)** | **Meaning category (first order theme)**

Organizing principles (second order theme)	Codes	Definition	Explanatory coding (action contexts)	Meaning category (first order theme)
The art of making — Ensure work is done for the purpose of doing it, appreciate the aesthetic value inherent in skillfully and masterfully crafting artifacts, and mobilize affective work for empowering people to engage with the art of making	Ingredients	Breweries transform different kinds of yeast, bacteria cereals, hops, fruits, spices, vegetables, etc. into agents that provide a district aroma and flavor to the final product	Sourcing resources	**Aesthetics** — To express aesthetic value, diverse inputs are required for crafting a diversified product and industry landscape through skillfully engaging heterogeneous processes and articulating local characteristics in the art of making
	Technology	Breweries transform different techniques, traditions, process, equipment, working procedures, time, etc. into an agent that draw attention to a specific aspect of the production process	Processing resources	
	Location	Breweries transform geographical indications, terroir, location, etc. into agents that illuminate the origin of specific brewing components		
	People	Breweries transform farmers, growers, makers, artists, customers, residents, workers, etc. into agents that have a significant impact on the final product	Being of service	**Affective work** — To enhance alternative social roles and new situations, affective work is needed to empower individuals and collectives in engaging with the art of making
	Relationships	Breweries transform connections with organizations, friends, colleagues, places, culture, etc. into agents that provide motivations for why a product is produced		
	Personal relationships	Sensory experiences that embody new perspectives on lived experiences	Individual focus	
	Customer relationships	Education focused interactions that intend to demystify beer		
	Community relationships	Space making through adopting a brewery as location for communal relatedness	Collective focus	
	Regional relationships	Interactions that bring a region to life through spatialization		
Cooperation as means to prosper — Ensure work is done for the benefit of all, enhance a collaborative ethos to be advantageous to and take advantage of shared resources, and mobilize a relational identity to prosper from cooperation	Equipment	Borrowing and lending of equipment and the use of inhouse technology for the benefit of another brewery	Input	**Collaborative ethos** — As small breweries are limited in their resources, a collaborative ethos is required that supports everyone to leverage the needed inputs, develop proficiency in necessary processes, and generating high-quality outputs to advance the overall performance of the sector
	Ingredients	Giving or borrowing of brewing ingredients and products to another brewery	Process	
	Product	Sharing how-to knowledge to improve another breweries performance and product quality, or to help overcome a challenge		
	Endorsement	Breweries partner for the production of a product or organization of an event	Output	
	Composition	Brewery workers background differs and so does their perspective on their profession		**Relational identity** — As small breweries become established in a given context, they need to develop a relational identity to signal how they situate themselves within existing social arrangements and how they steward this collective identity
	Orientation	Breweries offer different goods and services and serving different communities within a given context	Internal business dynamics	
	Organization	Breweries have different business models and tell different stories allowing them to co-exist in the same context		
	Region	Socio-spatial context as unique and different across space	External business dynamics	

Figure 3.2: Analytical procedure

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3.3.3 Data analysis

The gathered material was analyzed through a combination of thematic and content analysis (Vaismoradi, Jones, Turunen, & Snelgrove, 2016). Thematic analysis was used to identify organizing principles of metanarratives from the secondary data that reflected the underlying shared meaning. Thematic analysis is particularly useful for this purpose because it does not focus on statements within the analyzed material, but rather on understanding the themes that are often implicit within the data to "capture the essence and spread of meaning" (Braun & Clarke, 2019b, p. 845). Second-order themes were developed by adopting a reflexive approach to thematic analysis (Braun & Clarke, 2019a) which involved to 1) iteratively familiarize oneself with the data, 2) generate initial assumptions about themes, 3) test and revise themes, 4) name and define themes (Braun & Clarke, 2019b) (see for illustrative quotes Appendix F). While the analyzed situations are subject to potentially multiple metanarratives, I focused on the thematic analysis on understanding organizing principles that pertain to the context of this research. Accordingly, themes had to be meaningful in the context of craft brewing (as opposed to the brewing industry in general) and primarily relate to phenomena observed in the analyzed action contexts (as opposed to applying to craft breweries in general). The analysis identified two organizing principles (see Figure 3.2).

The results from the thematic analysis guided the qualitative content analysis of the case study material to generate codes and groupings of sensemaking for narratives of change (Zhang & Wildemuth, 2009). First, open coding was used to extract text passages from the gathered material that related to the two organizing principles of 'the art of making' and 'cooperation as a means to prosper.' Second, a list of all codes was subsequently generated to identify suitable groupings of action context (Elo & Kyngäs, 2008). Action contexts were analyzed to determine meaning categories that support the construction of narratives of change. Meaning categories were extracted by producing domain summaries that generated semantic descriptions of the key features in each group of codes. Following this procedure, 17 codes were grouped into nine action contexts, which were summarized into four second-order themes (see Figure 3.2).

3.4 Results and discussion: from organizing principles to sensemaking and narratives of change

The analysis identified two organizing principles that are at work in the action contexts in which craft breweries make sense of alternative practices and develop narratives of change. They include 'the art

of making' and 'cooperation as a means to prosper.' From the analysis, 17 codes emerged that helped classify nine action contexts in which sensemaking among craft breweries was observed to establish four meaning categories that help synthesize narratives of change (see Figure 3.2). The following sections describe this process in greater detail by drawing on both case studies simultaneously, as the same narrative can be generated from phenomenologically different actions and experiences (Muñoz & Cohen, 2018; Taylor Aiken, 2019).

3.4.1 Organizing principle: the art of making

The thematic analysis identified 'the art of making' as an organizing principle. Based on the analysis, this principle can be defined as: *Ensure work is done for the purpose of doing it, appreciate the aesthetic value inherent in skillfully and masterfully crafting artifacts, and mobilize affective work for empowering people to engage with the art of making*[2]. This principle points to a change in how practitioners sense the meaning of what brewing encompasses as a profession. 'The art of making' involves a withdrawal from understanding brewing as a mechanical process and requires brewers to create a new way of generating meaning from practice. In the case studies, the need for a new organizing principle that could inform sensemaking was expressed by statements such as:

> *"The only thing that counted in the industry was quantity. The production output was the only topic that brewers were discussing. No one would ask 'what beer styles are your brewing.'"* (IG1)

The analysis identified nine codes related to the organizing principle 'the art of making' and five action contexts that span from the supply side to the production space of craft breweries and include the context in which businesses are embedded (see Figure 3.2). The sensemaking that takes place in these contexts generated two distinct meaning categories for new narratives of change that, in turn, externalize the organizing principle 'the art of making.' Sections 3.4.1.1 and 3.4.1.2 examine how these meaning categories are constructed in action contexts.

3.4.1.1 Aesthetics as a meaning category of narratives of change

Qualitative content analysis revealed how craft breweries engage in sensemaking across three action contexts and collectively craft a meaning category around aesthetics for developing narratives of

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[2] See also Appendix F for illustrative expressions of this principle as well as scholarly contributions related to this principle (e.g., Garber, 2013; Kiem, 2012; Sennett, 2008; Zhan & Walker, 2019).

change. This meaning category can be summarized as: *To express aesthetic value, diverse inputs are required for crafting a diversified product and industry landscape through skillfully engaging heterogeneous processes and articulating local characteristics in the art of making*. The action context in which related sensemaking materialized were classified along the resource flows that craft breweries mediate, from 1) sourcing to 2) processing resources, and 3) being of service to local spaces.

The organizing principle 'the art of making' informs the rationale of action and purpose for businesses that were interviewed, specifically as they engage in the three action contexts. Interviewees articulated this by stating that "we're not just a business trying to make money" (IC6) and that the business purpose "is not primary economically oriented" (IG2), suggesting other goals that the brewery aspires to. This allows breweries to be "very committed to beer diversity in Northern Germany" (IG8), embracing a business purpose that is "really geared towards producing the highest quality beer and also to be a part of this community" (IC1). Moreover, they focus on "making some of the most unique beers in Ontario" (IC5) and creating a "new tradition" by "shaping the industry in new ways … to remember its history while staying curious … so that diversity prevails in the brewing landscape" (IG7). This alternative framing and engaging with the business purpose shaped the sensemaking among breweries and enabled them to generate new meanings from alternative action and arrangements.

The analysis identified five codes that show how craft breweries develop new 'story agents' in the sensemaking process to articulate the importance of aesthetics across the action contexts of sourcing, processing, and servicing. As the illustrative quotes in Table 3.1 shows, breweries actively create meaning by bringing into dialogue the mobilized ingredients, technology, locality, people, and relationships and articulate their relevance for the final product. By relying on these new 'story agents' for explaining why and how alternative practices are carried out as well as articulate the often-embodied sentiments, values, and affections related to alternative practices, craft breweries narrate a new reality into existence. As an interviewee stated, this new language and understanding "brings attention to local makers which a lot of people don't know… it's a unique experience going out to [local a farm] and picking [ingredients] and having an appreciation of like: 'holy shit, this is where it starts'" (IC2). Similarly, a German brewer stated: "Initially the highest priority was the quality [of ingredients], but I realized… that with organically certified ingredients, you can create a superior product from a flavor standpoint" (IG4). This new reality that small breweries verbalize is

attuned to their ability to exert influence on action contexts and shape narratives of change by emphasizing aesthetics as a meaning category.

Table 3.1: Exemplary quotes of how craft breweries animate new agents for telling a story that narrates an alternative socio-spatial reality into existence

Illustrative Quotes	Codes (story agents)	Action context
"This wet hop harvest pale ale is made with locally grown Cascade hops from [local grower] and Ontario malt from [regional maltster]. Our brewers teamed up with [neighboring brewery] to develop this recipe, then we all took a trip to the farm, picked some fresh Cascade hops and added them to this tasty collaboration brew. Bursting with fresh citrus and dank hop notes, this wet hop pale ale will knock your socks off!" (WC1)	Ingredients Locality People	Being of service Processing
"We did a beer that we called 'Stone Age Beer' that we developed with a customer who is an archeologist that told me about an ancient recipe he had come across… so we recreate that recipe with some tweaks and specific ingredients, and the people loved it. It was like magic with crazy colors and people really got into the story" (IG10)	Technology People Relationships	Processing Servicing
A post on social media shows a brewery worker labeling a new product release and the accompanying text reads "X is busy labeling our next release. Old Lazy Goat is a barrel-aged golden sour refermented on crabapples & aged on mulberries [with] 100 Meter local fruit." (PC1)	Ingredients Technology People	Sourcing Processing
"The first time [German brewer – A and American brewer – B] met they were both studying in Berlin. Years later, they met again at [US brewery] ... They are linked by their passion for the VW-Camper, Johnny Cash and real Hop Bombs. When our first brew was due in October 2015, B came to Hamburg to join this adventure … It is an honour … Especially since A 'saw the light' at [brewery of B]. Their Beers have impressed and inspired him so deeply that we decided to leave the US and go back to Germany to open up [German brewery name]." (WG1)	Locality People Relationship	Being of service

The new language and conceptual categories around aesthetics (see Table 3.1) also created a key challenge for craft breweries in aligning their sensemaking with the reality of their industry. Product standardization and consistency are well-established meaning categories embedded in narratives that have guided industrialization processes (L. Busch, 2000; Friedmann & McMichael, 1989; Wiskerke, 2009). While these categories did not make sense from the experiences of craft breweries, this challenge materialized differently in the two examined contexts. In Canada, aesthetics of brewing and the significance of breweries as meaning-makers in communities had disappeared entirely in the 20th century as the industry became dominated by a highly standardized product (Lamertz et al., 2016; Weersink et al., 2018). Large beer corporations heralded standardization and consistency as achieving mastery in industrial production because these concepts helped transformed a variable beverage into a shelf-stable and highly consistent product. Aesthetics as a meaning category provided the interviewed craft breweries with a new vocabulary to challenge this understanding by reinterpreting the goal of product consistency as being focused on consistent, high-quality small-batch brewing where iterations of a product brand may vary depending on the expressions of the involved 'agents' (see Table 3.1).

In Germany, 'craft' brewing never disappeared from the landscape, and small-batch brewing maintained its relevance. At the same time, the 'purity law' had diminished the variety of acceptable beer styles by limiting permitted ingredients and thus the 'agents' in Table 3.1 (Depenbusch et al.,

2018; Eble & de Vries, 2018). In response, craft breweries reinterpreted this law by shifting the emphasis from 'pure' to 'natural' ingredients to legitimize divergence from it (IG13; Deutsche Kreativbrauer e.V, 2019). These actions explicitly challenge large beer companies that commonly use flavor extracts and undeclared finings as they rely on industrial production methods. Also, because of its continuous existence, the term 'craft' brewing lacked novelty in Germany. Here, the emphasis on the involved 'agents' (see Table 3.1) enabled the new breweries to foreground the creative aspect of brewing and establish so-called 'creative breweries' (German transl. "kreativ Brauerei") as a synonym to its North American cousin.

These findings highlight the creative ability of small businesses to mobilize intentional action for constructing narratives that compose and recompose their identity and social arrangements to solve specific problems. This also speaks to the broader influence of small businesses and their ability to support the development of alternative food networks through these processes (Forssell & Lankoski, 2015; Kirwan, 2004; Marsden & Smith, 2005; Parrott et al., 2002). Aesthetics in this context, bring attention to approaches otherwise marginalized by the commodity- and efficiency-focused industrialization, helping to appreciate artisanship, tradition, purposeful innovations to support more sustainable practices in organizations and value the environmental characteristics of a specific place for foodstuff (Parrott et al., 2002; Shrivastava, Schumacher, Wasieleski, & Tasic, 2017; Wiskerke, 2009).

3.4.1.2 Affective work as a meaning category of narratives of change

Qualitative analysis also revealed how craft breweries facilitate and elevate affective work as a meaning category to substantiate narratives of change. This meaning category can be summarized as: *To enhance alternative social roles and new situations, affective work is needed to empower individuals and collectives in engaging with the art of making.* The action contexts in which related sensemaking materializes can be classified according to the ability of breweries to shape affective experiences (i.e., creating and managing emotions) through 1) individual and 2) collective engagement.

The organizing principle 'the art of making' influences how the interviewed businesses catered to people's affective experience as the principle mediates value creation and appreciation (i.e., what is created and what it is valued for). The interviewees articulated this by stating variations of "it is our responsibility to explain why it tastes different [in comparison to industrial products] and why this is the original" (IG3) and "when people come into the brewery, we make sure to explain the beers

properly [and to] talk about how excited we are to be making them" (IC5). This speaks to the need for craft breweries to supervise how individuals and collectives engage with and make sense of craft brewing and how the emerging uncertainties in situations and interactions enable craft breweries to gain meaning through affective work.

The analysis identified four codes that capture how craft breweries actively mediate and shape the affective experiences of people toward their endeavor. While they are interrelated, as the coded activities build onto each other, the codes can be organized according to the respective action contexts in which individual and collective experiences materialize (see Table 3.2).

Affective work in relation to individual experiences focuses on actively curating the sensemaking ability of their customers as they engage with craft brewing as a new approach to manufacturing (see Table 3.2, action context: individual). In both contexts, craftspersonship[3] has been marginalized through industrialization, which requires affective work by craft breweries to (re)condition their customers. Interviewees explained that this is accomplished by developing personal relationships with customers. One way of building trust when explaining their alternative approach to manufacturing is to offer free samples of their product. Accompanying conversations focus on understanding the (pre-conditioned) preferences of customers to develop a starting point for their journey into the aesthetic expressions of craft breweries – which is often a strategy to avoid a condescending explanation of what this new approach of manufacturing implies. This supports customers to have "fun to drink our beer and that helps them to develop a different understanding" (IG2). The goal of changing the underlying assumptions of customers relied on the ability of breweries to create a welcoming environment where "people will get the right experience when they come here" (IC5). As the quotes in Table 3.2 highlight, this includes both the physical environment and the social arrangements that organize it. In both cases, breweries facilitate personal experiences by framing their space directly or indirectly as 'friendly' (e.g., dog-friendly, family-friendly, etc.) and inclusive (e.g., catering to otherwise marginalized groups) in an effort to break established stereotypes around beer drinking. Also, interviewees empathized their "goal to demystify the whole concept of brewing and to let people in on what goes into brewing" (IG3) by offering brewery tours to small groups and

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[3]This term is intended to emphasize that artisanship can be pursued by people of different gender, race, and ethnicity whereas the common denomination of craftsmanship may insinuate a binary understanding.

educational seminars as well as food pairings courses that frame their product as a culinary experience.

Table 3.2: Exemplary illustrations for how craft breweries engage in affective work to shape individual and collective experiences

Illustrative Quotes	Codes	Action context
"We get a lot of people who are like "I saw the street sign [that says brewery], what does that mean? Do you do brew here?' And we talked to them about what goes into the beer, why it tastes different … And then we always provide them with samples, and we let them try different things. It's been fun to watch people go from asking for a [tasteless lager] then going up to our [ale] with the biggest flavors and then becoming just its biggest fans. To see that progression has been really great." (IC4) "Many [customers] haven't been to a craft brewery, so we let them try different styles, and then you ask 'what do you like, more malty or fruitier? … to get into a conversation and find something they like." (IG10)	Develop personalized relationship	Individual
"We are like an incubator, where people try new things that they haven't tried before and they learn that the term 'beer' is something else than what they thought it means." (IG6) We have [program name] to really be involved in the local community: there's a charitable aspect where we're giving back, but also an educational component where we're raising awareness to the women in the industry and trying to promote more women because there are always these stereotypes." (IC1)	Facilitate personalized experiences	
"The brewery turned into a local meeting spot for a lot of people … [that have] met here just through shooting the breeze over a few beers, have become friends, and then more people joined and become friends. [Customers] are going on vacations together and doing charity cycle rides together." (IC8) "We're like almost like a community center where people are meeting and talking to their neighbors … breweries are [now] playing way bigger roles in their communities and the sense of pride people are feeling when they come here." (IC5)	Mature collective experience	Collective
We consider ourselves as the city's brewery that's why our products are named after the different neighborhoods … this means that people really identify with our product and they have real dialogues about how their neighborhood is unique… we also support local organizations. To do something good for the city and give something back to people." (IG1) "We work with local makers, so maples season harvest is around April, so we team up with a local maple farmer to make maple-based [beer style]. Same with honey [to showcase] the tangible products within our community." (IC2)	Advance spatialized relationships	

Affective work in relation to collective experiences focused on maturing and advancing emotional connection among people and their relationship to a specific place (e.g., the business or a locality) (Heaphy, 2017). In both cases, the interviewed breweries suggested that their affective work would only have partial influence if at all, over managing collective experiences around the brewery by stating variations of "beer just helps conversation and builds community and it just seems to happen" (IC3). Yet, they do assume an active role in enabling emotional attachment with their business and their place by working with local organizations on specific social issues or co-hosting events and presenting themselves as a business that people can identify with. As such, breweries assume an active role in local place-making through affective work as they craft spatialized stories around their product (see Table 3.1) and build socio-spatial relationships (see Table 3.2). These relationships become patterned through individual and collective experiences in the process of developing an affinity toward a locality and its makers.

Narratives of change gain meaning through affective work as they curate individual and collective experiences with alternative practices and social arrangements. This draws attention to craftspersonship, as craft brewing "finds its value in affect, defined primarily as the power to act" that emphasizes the people involved in its creation instead of viewing "capital as the maker" (Bratich, 2010, p. 308). The analysis illustrates that this power to create situated meaning is not held by individuals but realized through collective action between makers and users of material artifacts that gain cultural significance through activities that "activate[s] thinking" (Hawkins, Marston, Ingram, & Straughan, 2015, p. 338). Affective work elevates makers and users to creators of meaning. Yet, no single individual or group has the interpretational sovereignty to tell right from wrong or (in)validate preconceived notions or social arrangements. Accordingly, the notion of aesthetics is shaped through social interaction in the process of creating a product and embodying it with meaning.

As craft brewing leverages affective work as a meaning category, it is chiefly concerned with "material and cultural production" (Fox Miller, 2017, p. 9; Kiem, 2012). This enables the analyzed small businesses to multiply their efforts by making the narration of an alternative reality subject to collective storytelling. However, in this case, an emphasis on pluralism cannot be simplified into a counter-movement agenda, which has been suggested by others (Herman et al., 2005; Wittmayer et al., 2019). Instead, the examined actors crafted narratives of change because they gain meaning from organizing principles (e.g., 'the art of making') to make sense of new ways of doing (Davies, 2002) and not merely by challenging a particular manufacturing process and compete with its advocates.

3.4.2 Organizing principle: cooperation as a means to prosper

The thematic analysis also identified 'cooperation as a means to prosper' as an organizing principle at work in craft brewing businesses. Based on the analysis, the principle can be defined as: *Ensure work is done for the benefit of all, enhance a collaborative ethos to be advantageous to and take advantage of shared resources, and mobilize a relational identity to prosper from cooperation*[2]. This principle points to a change in how actors sense the meaning that is generated from industry affiliation. 'Cooperation as a means to prosper' deviates from the conventional understanding that businesses in the same sector are necessarily in competition with one another. Instead, this new organizing principle allows craft breweries to generate new meaning from industry-internal collaborations. In the

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[2] See also Appendix F for illustrative expressions of this principle as well as scholarly contributions related to this principle (Drakopoulou Dodd, Wilson, Mac an Bhaird, & Bisignano, 2018; e.g. Ettlinger, 2003; Mathias et al., 2018; Sennett, 2012)

case studies, the need for a new organizing principle that could inform sensemaking of cooperation was expressed by statements such as:

> *"Everyone benefits when there are others there that do the same thing" (IC4) and*
> *"if anything, it's about building a stronger community" (IC6). "[Because] anyone*
> *who starts brewing enhances the [German] beer market" (IG3).*

The analysis identified eight codes related to the organizing principle 'cooperation as a means to prosper' and the five action contexts that span from the input to the process and output dimension of the analyzed businesses, including their internal to their external relationships (see Figure 3.2). The sensemaking that takes place in these action contexts generated two distinct meaning categories for new narratives of change that, in turn, externalize the organizing principle' cooperation as a means to prosper.' Sections 3.4.2.1and 3.4.2.2 examine how these meaning categories are constructed in action contexts.

3.4.2.1 Collaborative ethos as a meaning category for narratives of change

The qualitative content analysis revealed how craft breweries create meaning around a collaborative ethos across three action contexts that mediate related sensemaking. This meaning category can be summarized as follows: *As small breweries are limited in their resources, a collaborative ethos is required that supports everyone to leverage the needed inputs, develop proficiency in necessary processes, and generate high-quality outputs to advance the overall performance of the sector.* The action contexts in which related sensemaking was observed related to the 1) inputs, 2) processes, and 3) outputs of the analyzed businesses

The organizing principle' cooperation as a means to prosper' influenced how breweries engage across the three action contexts as it informed the attitude that individuals display when engaging with one another. Interviewees articulated that when they started their business the "most important initiative was 'together and not against one another'… and we needed to break the ice for doing this with people who only knew the old [industry]" (IG2) and that "I am just amazed how open and supportive the industry is. I've never been in an industry like this" (IC3). Accordingly, the organizing principle changed the understanding of social arrangements between small breweries and emphasized peer recognition and mutual support in the process of creating a collaborative ethos that enabled the sharing of tangible and intangible resources.

The analysis identified five codes that speak to areas where the collaborative ethos among craft breweries materialized (see Table 3.3). Identified activities were carried out ad hoc to circumvent encountered challenges or were planned to advance existing efforts; over time they collectively established an elaborate quid pro quo system among breweries in geographical proximity. For example, referring to the process of securing the needed ingredients or equipment for production, an interviewee stated "yesterday, I noticed that I was short on [ingredient] for today's brew day, so I just call [IC3] up to see if I could borrow some" (IC13). Another interviewee stated

> *"[brewer from small brewery] came by the other day and borrowed some small barrels, or he comes by for a bag of [ingredient]… I also know the brewer from [transnational cooperation] and he helped me out once when I needed a specific type of glass bottles… I also visit [larger craft brewery] sometimes because they have a good laboratory set up so they can analyze things that I can't …this all is done through informal channels" (IG9)*

Similarly, in both case studies, interviewed breweries offered many examples of how they borrowed expensive equipment from, or loaned it to, other breweries, or completed capital intensive analyses for each other. For example, "[IG7] helped me out big time recently when I screwed up my analysis and they were able to redo it because they've got this expensive machine… I offered to pay for it, but they were just 'no just bring us some beer'" (IG10) [IG4, IC2, IC3 articulated similar sentiments]. Aside from circumventing challenges on an ad hoc base, breweries also work together to collectively purchase equipment [IG2 and IG4], plan shared delivery service [IC5 and IC7], bulk-ordered ingredients [IG6, IG10, IC11, IC6, IC12], or timed their manufacturing process to use equipment or reuse ingredients from another brewery [IG5, IC1, IC5, IC10]. Moreover, in both case studies, breweries very frequently collaborate in the manufacturing of products by organizing so-called 'collaboration brews' between befriended breweries or because they were "fans" of a brewery as stated by one interviewee

> *"so far, we have done ten [collaboration brews] this year, with breweries in the region but also with breweries from [out of province] and the US. And you pick their brain as much as you can when you have those meetings, what trends they're seeing … [and] share brewing techniques" (IC5).*

Also, in both case studies, breweries collectively organized annual festivals to promote the local brewery scene or host small events to release a product of a collaboration brew [IG1, IG3, IG7, IC1, IC6, IC8] (paraphrased examples are provided in Table 3.3). While the interviewed breweries noted the benefits of establishing such a support system they also rationalized collaboration brews as a marketing tool. At the same time, they readily acknowledged that

> *"I don't know if anyone even wants to ask that question [if customers value collaboration brews] because [we] just like getting together with friends to drink and make a great beer" (IC1)*

> *"I really enjoy [these collaborations] because they stimulate creativity, you always learn something, think outside the box and get inspiration from outside … and again there is the fun factor" (IG9).*

Accordingly, the observed activities nurtured the comradery among brewers, and as breweries narrated this collaborative ethos into existence, it (re)created a geographically bounded, tight-knit group of businesses with an emphasis on the intrinsic value of having a support system that works to the benefit of all. This sensemaking took place through informal interaction or 'non-markets' as breweries relied on trust and reciprocity of giving and receiving favors among the network of craft breweries over time. The collaborative ethos enabled breweries to creatively solve other problems, for example, when resolving trademark infringements between breweries within the same region (IC11) or from different regions (IG8) through friendly conversation or collaboration brewing for a special event.

Table 3.3: Forms of collaborations facilitated through the collaborative ethos

Paraphrased examples	Codes	Action context
• Giving ingredients to another brewery that may have accidentally run out of them or needs them for a specific recipe • Circulating yeast between breweries to allow for multiple used instead of disposing it after single-use or ordering in bulk for other breweries	Ingredients	Input
• Providing a brewery with technology that is only needed during the set-up of brewing equipment or for specific circumstances • Conducting product analysis for another brewery that may have lost records for a specific product	Equipment	Process
• Showing another brewery how to master a specific beer style or developing a business plan • Consulting another brewery on whether or not to make a specific equipment upgrade	Practices	
• Collaboration to develop new or cherish established friendships between brewers by partnering for the production of a new beer Collaboratively hosting an event at one brewery to showcase the regions brewing excellence	Product	Output
• Inviting another brewery into the facility of the hosting brewery to present their product and business to the public or sell their beer through the taproom • A brewery shares the activities of another brewery by reposting and endorsing their activities publicly	Endorsement	

The collaborative ethos establishes a shared reality where breweries believe in needing each other to operate viable businesses while they flexibly divert from and adhere to this social imagery. The analysis revealed that breweries compose and recompose spatial and moral arrangements when necessary to shape the context of action. The so imagined future does not neatly fit the "moral landscape" and "cultural superiority" that definitions of craft brewing suggest (Fox Miller, 2017, p. 12). In both case studies, as illustrated above, craft breweries drew on the resources of large breweries and transnational beer corporations in their proximity to circumvent challenges. Moreover, the moral high ground that scholars may position initiatives on as they seemingly challenge established social arrangements – for example, around market competition (Mathias et al., 2018; Wittmayer et al., 2019) – does not align with the experience of the analyzed businesses. The analysis revealed that craft breweries exercised moral flexibility to engage or refrain from engaging in the activities listed in Table 3.3. In doing this, they transcend the narrow framing of "a David versus Goliath like battle" with craft breweries indenting "to damage and defeat rivals – incumbents" (Mathias et al., 2018, p. 3109). Instead, the interviewed breweries crafted narratives of change that externalizes organizing principles for developing an evaluative framework to discriminate social experiences instead of adopting market category-based judgments, as interviewees suggested:

> *"Yes, apparently you need to have an image of your enemy, of your competitors,*
> *to survive in the market … but we don't have an image of the enemy. Of course,*
> *we have emotions… and we really like some of the other craft breweries, and*

some are just really distribution oriented because they have investors and for them, it's not about creating unique products it's just about marketing" (IG2)

The industry has changed since I started to work at [brewery name] … [now] you also have these giant people just coming and it's all about making money… and that's just part of the growth of the industry… If I talk to the owner I'll have a pretty good idea if they're just doing this because it's a business venture… for example, [brewer's name] is a great guy but I'm not going to hang out and have anything in common with the owner of [that brewery]" (IC6)

Accordingly, narratives of change are non-teleological; they do not precede action but are the outcome of a course of action that is intentional, creative, and situational, directing and redirecting the construction of narratives (Joas, 1992). Narratives of change are generated through social (inter)action, deliberation, and experimentation that modify the context of meaning-making and what action actors perceived as meaningful. This interpretive flexibility of actors challenges the often-binary distinction between the old and new industry or between incumbents and new entrants as they are inextricably linked through social interaction (Boonstra & Joose, 2013). Instead, actors can simultaneously engage in multiple (cooperative) relationships that operate under divergent or complementary narratives, and social interactions remain unchanged or are adapted to enable or avert new action.

3.4.2.2 Relational identity as a meaning category for narratives of change

The qualitative content analysis of the case material revealed how craft breweries purposely positioned themselves – spatially and conceptually – to complement existing initiatives of other businesses. The analysis points to a meaning category around relational identity, which can be defined as follows: *As small breweries become established in a given context, they need to develop a relational identity to signal how they situate themselves within existing social arrangements and how they steward this collective identity.* Related action contexts were sensemaking materialized included 1) internal and 2) external business features.

The organizing principle' cooperation as a means to prosper' influenced how the interviewed businesses perceived the social context in which they positioned themselves. Interviewees articulated the importance of having other breweries in close proximity by stating that "[this product] is not like toothpaste where you pick one and stick to it. It's good when there's variety [in the region] and there

are things to choose from" (IC4) and "in this industry, labels and bottle shapes are not the [unique selling proposition] instead you have beer styles" (IG2). Also, interviewees in both case studies often referenced the industry in the United States, emphasizing that they considered their country "years behind" and the opening of more breweries in close proximity as "a good thing … [because] it pushes me as a business owner but also as a brewer to set myself apart from others and kind of raise the standards" (IC2). These quotes speak to the need for new sensemaking processes through which actors dynamically situate themselves in relation to other businesses within a given region.

The analysis identified four codes that capture the sensemaking processes related to the relational identity of actors within and outside of their business (see Table 3.4). The analysis revealed that the motivation to open a craft brewery often was supported by personal experiences abroad as well as new entrants relied on workers that had unrelated career paths outside of the brewing industry. While some interviewees mentioned that they gained relevant experience only by pursuing brewing initially as a hobby [IG5, IG6, IG10, IG11, IC3, IC4, IC6, IC7,], others transition into craft brewing from unrelated career paths because "the beer industry is so cool" (IC5) and left their jobs as managers, teachers, accountants, consultants, musicians, chefs, and researchers. In both case studies, this exposed them to uncharted territories for positioning and operating their business. Therefore, new entrants may view existing breweries as "benchmark and think 'at [brewery name] they do this or that pretty well' or 'why aren't they doing this or that'" (IG7). Similarly, new entrants may position themselves in relation to existing breweries, as an interviewee explain "the reason we chose this location, is that we looked at the overall map of the region and where all the breweries are located and we sort of saw an empty area at this end of the [city]" (IC3).

These sensemaking dynamics allow craft breweries "to really leverage each other's success… [and develop] different goals" (IG5). These attitudes enable the interviewed breweries to focus on differences as they compare themselves to similar businesses in the region. For example, "we get lots of reciprocal business… because [IC7] got more English styles… we have a lot of Belgian beers" (IC5) [also IG5, IC6] or emphasized differences in brewery models (e.g., neighborhood brewers, brewpub, distribution brewery) and suggested to "call them the beer community and culture" (IC8) [also IG5, IG8, IG10, IC2, IC5]. Moreover, as similarities between craft breweries emerge, interviewees stressed the importance of geographical differentiation as illustrated by this quote "we have a similar concept as [IG10] and [IG11] but we are really good friends and they focus on their local neighborhood so we don't compete with each other" (IG6).

Collectively, this allowed breweries to connect their manufacturing with a particular region because "beer was and will always be a regional product" (IG1). In both case studies, this created a referral network as craft breweries recommend customers to visit other craft breweries in the region to experience different beer styles as well as referencing each other if asked for who drives excellence in the region. Interviewees frequently stated the significance of different brewing regions for advancing their understanding and providing inspiration, or they "discovered the diversity of beer styles while traveling in Europe… and in the United States" (IG8) [similarly IG1, IG2, IG3, IG6, IG9, IG11, IC1, IC3, IC6, IC7, IC14, see also Table 3.4]. In both case studies, these experiences encouraged interviewees to explicitly model their business after craft breweries that operated outside of their own region (IG8, IG10, IC2, IC5, IC8).

Table 3.4: Forms of differentiations developed through a relational identity

Paraphrased Examples	Codes	Action context
Brewery workers background differs and so does their perspective on their profession. Workers may have formal education, changed career, or are self-trained as well as they differ in their minority status, age, gender, and social class	Compositional diversity	Internal business features
Breweries offer different goods and services and serve different communities within a given context. A brewery may rely on specific processes to produce different types of goods and services as they rely on different inputs (ingredients, equipment, people, etc.)	Orientational diversity	Internal business features
Breweries have different business models and tell different stories allowing them to co-exist in the same context. This includes businesses that operate as brewpubs, neighborhood, and microbreweries, regional brewery, etc., are inspired by a distinct tradition (e.g., German, Belgium, American, etc.) or practice (e.g., sour, barrel-aged, hop or yeast forward beer, etc.)	Organizational diversity	External socio-spatial features
Breweries mobilize the socio-spatial context as a unique resource. Breweries that operate in a given region create a distinct identity through adapting and shaping contextual characteristic (e.g., history, culture, tastes, ingredients)	Regional diversity	External socio-spatial features

Organizing principles can mobilize the ability of businesses to collectively engage in sensemaking to verbalize alternative arrangements into narratives of change. As illustrated above, business differentiation is nurtured in each case study through the dynamic relationship of existing craft breweries and newly opening businesses within a given context. This is enabled through a "differentiating exchange" among seemingly similar businesses as they position their business in relation to each other (see Table 3.4) (Sennett, 2012, p. 78). This type of social exchange requires reflexivity through interaction around material artifacts to build increased awareness and understanding of how actors differ (Stigliani & Ravasi, 2012). As demonstrated by the results, craft breweries in the same region are well versed in each other's products, and because of established friendships are capable of engaging in "mindful collective construction and refinement of new interpretations" (Stigliani & Ravasi, 2012, p. 1249). These shared experiences enable actors to better understand "their own interests, their own desires or their own values" (Sennett, 2012, p. 79). This

opens possibilities for actors to mobilize narratives of change that externalize organizing principles around cooperation to establish brewery-specific territories that allow for co-existence through differentiation. Sensemaking around 'cooperation as a means to prosper' enabled breweries to perceive each other as auxiliaries in creating beneficial conditions within their socio-spatial context to operate economically viable enterprises, instead of assuming the principles of market competition as organizing force.

3.4.3 Contribution: group affiliation and normativity in narratives for change

The findings bring into dialogue research on sensemaking and metanarratives by empathizing their interdependencies. While actors 1) draw on alternative organizing principles to comprehend and engage meaningfully in new action contexts, they 2) construct new narratives of change through sensemaking that creates new meaning categories for new actions to align current situations with the envisioned future (Figure 2.1). Bringing together conceptualizations of metanarratives and organizing principles with sensemaking and narratives of change through empirical research suggests the need for better understanding 1) the role of actors' positionality in mobilizing narratives of change to 2) achieve specific ends.

This research shows that narratives of change externalize organizing principles that are relevant to a specific actor group while their characteristics determine the shape and form of sensemaking. Put differently, "the 'how' of sensemaking can never be understood as inoculated from the 'who'" (De Rond et al., 2019, p. 1981). People and their networks are not interchangeable and the act of sensemaking cannot be separate from their idiosyncrasies. Sensemaking emerges from who people are and with whom they relate, and how they experience that relatedness. This perspective complements existing research that has primarily focus on how individual actors make sense and articulate narratives (Christianson, 2019; Maitlis & Christianson, 2014) and the role of context specifics and material artifacts in this process (Bien & Sassen, 2020; N. Jansson, Lunkka, Suhonen, Meriläinen, & Wiik, 2019). The empirical insights of this study demonstrate that the contextualization of organizing principles, first, is contingent on the characteristics of the actors that engage in sensemaking and, second, they shape the storyline that is constructed as actors and their action cannot be separated. In both case studies, small businesses conducted themselves very differently in comparison to each other and the incumbents while they drew on and contextualized organizing principles in ways that suited their realities. This positions small businesses as an actor with agency over their future (Westman et al., 2019) instead of conceptualizing them as reactive or assuming that

(simply) "narratives generate "the capacity to act and to give meaning to action"" (Collon, 2007 cited in Garud, Gehman, & Giuliani, 2014, p. 1182). This extends observations that individuals engage in unique ways in sensemaking that reflect their positionality (De Rond et al., 2019) to appreciate the role of group affiliation in shaping the ability of actors to construct narratives of change (Luederitz et al., 2017). Future research could expand on this understanding to examine how individuals and collectives align and realign narratives of change with their actor roles to reconstruct their interests and experiences in light of future imaginaries that are advantageous to their positionality.

The organizing principles that actors draw on to make sense in action contexts and that narratives of change externalize, provide room for new experiences through which actors internalize new "ideologies" that "shape how they view the world" (Schildt et al., 2020, p. 244). These considerations complement the extant literature that has assumed sensemaking as a largely apolitical process. The way how the analyzed actors crafted the respective narratives of change in response to their place-based experiences while articulating an alternative imaginary illustrates this "antagonistic relationship with dominant societal narratives" (Wittmayer et al., 2019, p. 4). Yet, this research shows that this agnostic relationship is not born out of the explicit goal to challenge existing belief systems. Instead, it is rather an attribute that emerges from the appeal of alternative organizing principles that resonate with the "values and expectations that people already hold" (Davies, 2002, p. 25). Thus, it is not the action per se that carries transformational potential (e.g., sourcing locally or supporting neighboring businesses), instead it is the collective ability of small businesses to intentionally and discursively align these activities with alternative organizing principles to instigate change processes. Future research could expand on this line of research to understand the role of metanarratives in emancipating otherwise overlooked actors and how they could purposefully draw on organizing principles in ways that enable them to express new value systems in support of sustainability transformations.

3.5 Conclusion

It is increasingly acknowledged that addressing grand challenges such as climate change requires new ways of organizing society. This requires new approaches to discursively align and justify the kind of activities and goals that empower actors to engage in 'new ways of doing' to contribute to fundamental transformations. To better understand how actors can collectively construct narratives of change – the storylines of sustainability transformations – this research examined the importance of metanarratives and their organizing principles in informing the sensemaking of actors in action

contexts. This study examined the 'craft brewing revolution' to understand how phenomena and their narration are exported across geographically disconnected regions. This involved examining the metanarratives that are shared among craft breweries in the United States, where the movement emerged in the 1960s and 1970s to identify organizing principles that may inform the opening of new breweries in two case studies, one in Canada and one in Germany. Building on qualitative content analysis of primary and secondary data, this research demonstrated how new actors drew on alternative organizing principles to give meaning to new activities and mobilize emerging meaning categories for constructing narratives of change that externalize new belief systems and with it new organizing principles.

The empirical research emphasizes the creative ability of small businesses to appropriate and redefine categories of conventional practices by reflecting on the historical conditioning of activities and reinterpreted them to condition future imageries. Moreover, the findings illustrate how the novelty of new meanings that establish narratives of change emerge from the actors' ability to contextualize organizing principles, composing and recomposing themselves in the process of engaging in new established ways of doing. Accordingly, narratives of change that guide sustainability transformations do not emerge in a vacuum as both alternative organizing principles of metanarratives and the sensemaking of actors are mutually dependent. It is the sensemaking ability of the actors and their emerging group affiliation that allows them to cast in a new light the actions that are new in the respective context while drawing on reminiscent situations in the past and other contexts

This research advances the extant literature by offering a novel approach for integrating metanarratives and organizing principles with sensemaking and narratives of change. Related avenues for future research could focus on how individuals and collectives align and realign narratives of change with their actor roles to construct future imaginaries that are advantageous to their positionality. Also, explorations are needed into the role of metanarratives in emancipating otherwise overlooked actors and their action to better understand how they could purposefully mobilize organizing principles to express new value systems for accelerating change for sustainability.

Supporting fundamental change for sustainability is contingent on the discursive abilities of unusual actors to mobilize action for crafting narratives of change that verbalize new realities into existence. To understand and support this process, future research will be required to more fulsomely appreciate

the creative ability of actors that gain meaning from a collectively reimagined identity to reshape social interaction in the process of developing new meaning-systems.

Chapter 4

Knowledge Flows and Sustainability Niche Construction: Examining the Craft Brewing Movement in Canada and Germany

Abstract

Sustainability niche construction refers to processes through which individual and collective actors transform the context in which they operate via experimentation. Such processes create conditions conducive to the emergence of alternative practices, values, and beliefs. Niche construction is contingent on tangible and intangible assets that support actors, such as small businesses, to innovate and experiment with alternative arrangements. Most research on sustainability transitions has employed historical case studies to examine the role of tangible assets in niche construction, such as technologies and policies. However, intangible assets, especially knowledge, have received little attention and still lack empirical examination in ongoing niche construction processes. This article shows how craft breweries, defined as small and independently owned businesses that are inspired by traditional and non-industrialized practices, mobilize knowledge to construct sustainability niches in the highly industrialized and competitive environment of the brewing industry. This research examines two international case studies to detail how small businesses continuously translate between tacit and explicit forms of knowledge, so-called knowledge conversion, to create conditions that are supportive of alternative arrangements. The results illustrate how this conversion supports small businesses in the brewing industry to 1) respond to and transform the context in which they operate, 2) collectively formulate goals that shape the directionality of change, and 3) bring tangible assets into service for experiments to realize emergent possibilities. Moreover, this research demonstrates how knowledge conversion can enable industrial grassroots niches in which small businesses pioneer sustainability efforts, even in the absence of direct support of innovation policies that provide subsidies, research funding, or support knowledge sharing.

4.1 Introduction

Efforts to transform whole industries towards sustainability, from production to consumption, require the right niche milieu to flourish (A. Smith et al., 2010). A niche can provide a protective space, shielding such efforts against negative outside pressures (A. Smith & Raven, 2012; Verhees, Raven, Kern, & Smith, 2015). It can nurture experimentation with new ideas and artifacts, supporting learning and altering underlying assumptions to create sustainability solutions (Boon & Bakker, 2016; van Mierlo & Beers, 2020). A niche can also empower actors to accelerate change towards sustainability as experiments penetrate the surrounding context and contribute to the transformation of conventional logics through novel practices, values, and beliefs (Raven, Kern, Verhees, et al., 2016; Schot & Geels, 2008).

Actors contributing to niche construction can be individual agents, e.g., the owner of a business, or collectives, e.g., the entire business as an organization or a group of firms (L. B. Fischer & Newig, 2016; March & Simoni, 1993). Niche construction is contingent on actors to mobilize tangible and intangible assets in protecting experiments from outside pressures (Coenen et al., 2010; Longhurst, 2015). The scholarship on sustainability transitions has conceptualized the mechanisms through which this occurs and the actors that support it through historical case studies of technological innovations (e.g., in energy and transportation systems) (Markard, Raven, & Truffer, 2012). Previous research has emphasized the active role of policy instruments (e.g., subsidies and feed-in-tariffs) and tangible assets (e.g., research funding, venture capital, pilot projects) in system transformation (Hermans, Van Apeldoorn, Stuiver, & Kok, 2013; Lopolito, Morone, & Taylor, 2013; Raven, Kern, Smith, Jacobsson, & Verhees, 2016; Raven, Kern, Verhees, et al., 2016; Turnheim & Geels, 2019). However, few studies have looked beyond technology-centered niche construction in transforming industries to explicitly study how underlying processes rely on intangible assets such as experiences and expertise and the role of experimental learning (Caniglia et al., 2017; Järvi, Almpanopoulou, & Ritala, 2018; Kuokkanen et al., 2018; Loorbach et al., 2020). This is especially true for knowledge as a relational and intangible asset (Macpherson & Holt, 2007) that is a prerequisite for any innovation (Bergek, Jacobsson, Carlsson, Lindmark, & Rickne, 2008; Binz, Truffer, & Coenen, 2016; Muller & Zenker, 2001). Often, knowledge is conceived of as rather static, conceptualized as cognitive frames in 'local' practices and routines or as 'global' discursive frames (Raven & Geels, 2010; Schot & Geels, 2007; Sengers & Raven, 2015). For understanding how it can support actions that underlie niche construction, a more dynamic conceptualization of knowledge is needed. Furthermore, it is still

unclear how actors can mobilize knowledge to access tangible assets such as technologies, networks, or business models.

This article empirically explores the dynamic role of knowledge in niche construction processes and how it supports actors to collectively protect and encourage sustainability experimentation. By analyzing two geographically bounded business networks, this research examines knowledge conversion processes among craft breweries that have generated significant transformation in the brewing industry. Through primary and secondary data analysis, we seek to understand how small businesses can construct and modify the conditions under which they operate to support alternative arrangements, practices, and beliefs. More specifically, we ask: What can transformation processes in the brewing industry in Canada and Germany teach us about how small businesses mobilize intangible assets such as knowledge to support sustainability niche construction?

The contribution of the article is to systematically examine the role of knowledge (i.e., an intangible asset) in supporting private organizations to collectively engage in niche construction. This research moves beyond the retrospective analyzes of historical cases through which previous studies have explored the outcomes of niche construction and the underpinning mechanisms. Instead, we focus on ongoing niche construction and the interrelated processes to highlight the involved agency and how actors and their actions are at work in shaping and modifying the conditions that determine the development of niches. By foregrounding the processes involved in niche construction, this research offers a nuanced conceptualization of how knowledge supports interactive learning in sustainability niches. The results demonstrate that organizations mobilize knowledge for constructing niches in response to the context in which they operate by formulating meaningful goals to collectively shape the direction of change, and by bringing tangible assets into service for experiments to realize new possibilities. This suggests that private organizations can engage in niche construction in a grassroots fashion, with small businesses pioneering sustainability initiatives through shared action and strategies to create fundamentally different industry arrangements.

In the following section, we conceptualize processes and knowledge in relation to sustainability niche construction. Next, we provide a brief background of the studied industry before examining the case studies, detail how the research was conducted, and present the research findings. In the discussion, we turn to the research question and provide a more nuanced conceptualization of the role of knowledge in sustainability niche construction processes.

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4.2 Conceptualizing knowledge conversion in sustainability niche construction processes

Sustainability niche construction refers to those processes that actors mobilize to transform the context in which they operate through experimentation by creating conditions conducive to alternative practices, values, and beliefs (Laland, Boogert, & Evans, 2014; Schot & Geels, 2007). The interdependency between the influence of a particular context on the (inter)action of actors and how these actors drive its transformation is at the core of niche construction. Below, we discuss sustainability niche construction processes (Section 4.2.1), and the key role knowledge flows play in this context (Section 4.2.2).

4.2.1 Sustainability niche construction processes

Sustainability niches require extensive support to generate fundamental change. Niches are disadvantaged as they require new markets, user habits, and different technological infrastructure than incumbents do, and often lack supportive research and development, policy and regulations, and cultural arrangements (A. Smith & Raven, 2012). The scholarship on niche construction has identified three mechanisms that *shield*, *nurture*, and *empower* the niche against unfavorable conditions (Raven, Kern, Verhees, et al., 2016; Schot & Geels, 2008; A. Smith & Raven, 2012). *Shielding* refers to processes that hold off outside pressures from interfering with the niche context through policy incentives, incubators, and proactive environmental groups (A. Smith & Raven, 2012; Verhees et al., 2015). *Nurturing* signifies "processes that support the development of the path-breaking innovation" through articulating expectations about future technology performance, building cross-sectoral networks, and learning processes (Schot & Geels, 2008; A. Smith & Raven, 2012, p. 1027). And, *empowering* refers to enabling the niche to compete "within unchanged selection environments" or to changing that environment to favor the niche (A. Smith & Raven, 2012, p. 1026). Previous research has primarily focused on the role of these mechanisms in enabling niche construction (Kemp, Schot, & Hoogma, 1998; Kern, Verhees, Raven, & Smith, 2015; Verbong, Geels, & Raven, 2008; Verhees, Raven, Veraart, Smith, & Kern, 2013). Yet, because of the primary focus on retrospective analyses of historical cases, policy intervention, and technology-focused change, such research has provided limited insights into ongoing niche construction where agency and intangible assets present "analytic and epistemic challenges" to understanding related processes (Kuokkanen et al., 2018, p. 1514).

We draw on philosophical pragmatism to shed light on the role of intangible assets (e.g., knowledge) in ongoing niche construction processes in the context of non-technical innovation (e.g., craft brewing) (Ansell, 2011; Farjoun, Ansell, & Boin, 2015; Ferraro et al., 2015). A pragmatist lens can advance niche construction theory by providing an analytical angle which emphasizes the role of individual and collective actors in constructing sustainability niches, as pragmatism suggests that a) actors act on the context in which they operate while generating changes in that context, b) (inter)actions make niches meaningful for actors that reconstruct their vested interests under new circumstances, and c) creative action generates new possibilities through learning. Drawing on these considerations, we suggest that niche construction processes are responsive, interpretative, and emergent (see Figure 4.1).

- **Niche construction is responsive:** A pragmatist perspective emphasizes that any innovation is constituted in relation to its context (Dewey, 1922; Mead, 1934). As actors respond to contextual changes, they define and make possible the scope of activities within the niche. Thus, protecting niches through policy interventions might not be the most critical element. Looking at niche construction processes through a pragmatist lens, the inquiry shifts to how actors construct niches in response to a given context to carve out a safe space for experimentation.

- **Niche construction is interpretive**: A pragmatist perspective emphasizes that (inter)action among actors creates meaning (Blumer, 1969). Therefore, it is not the expectations about (future) technology performance that instigate or guide niche construction. Rather meaning-making supports niche construction and "that these meanings are handled in, and modified through, an interpretative process" (Blumer, 1969, p. 2). Pragmatism makes it possible to shift the focus to how actors collaboratively create meaning through learned behavior that guides and nurtures experimentation (see Ansell, 2011 on evolutionary learning).

- **Niche construction is emergent**: A pragmatist perspective emphasizes that experimentation helps discover and generate new possibilities for niche construction (Ferraro et al., 2015; Herrigel, 2010). It is through experimentation and reflexivity that actors creatively improve niche performance as they mobilize assets for overcoming contextual constrains. This "leads to the modification of goals as actors encounter and

experiment with means that alter the context of action and change the range of possibilities" and collectively improve the niche (Herrigel, 2010, p. 19).

4.2.2 Knowledge conversion flows in sustainability niche construction

The ability of organizations to drive change in support of sustainability through niche construction is contingent on their own knowledge and their access to the knowledge of others (Asheim & Coenen, 2005). Knowledge has often been regarded as the most important asset that is available in niches "because learned knowledge can guide niche construction" and orient experimentation toward a "particular direction of transformative change" (Ingram, 2018; Laland & Brown, 2006, p. 77; S. L. Morgan, 2011; Stuiver, Leeuwis, & Douwe van der Ploeg, 2004; K. M. Weber & Rohracher, 2012, p. 1042). Knowledge supports new niches through dynamic processes of learning, which often requires translation and adaptation of practices across different contexts (Boisot, 2011; Nonaka & von Krogh, 2009; Schwartz & Sharpe, 2010). This means that actors can mobilize knowledge for envisioning a desirable future and for contextually realizing efforts through experimentations (Ryle, 2009; Schön, 1983).

In processes of niche construction, knowledge can have two main forms: tacit and explicit (Binz & Truffer, 2017; Coenen & Díaz López, 2010; Raven & Geels, 2010). Here, tacit knowledge refers to personal knowledge, generated from individual experiences and embedded in skills, expertise, beliefs, and values (Gertler, 2003; Polanyi, 2009). Explicit knowledge refers to abstract and codified knowledge that can be verbalized, assessed, and stored (Binz & Truffer, 2017; Coenen et al., 2010). While research has primarily focused on structuring and comparing explicit knowledge in niche construction (e.g., Raven & Geels, 2010), the importance of tacit knowledge for sustainability has gained increased attention for learning and realizing fundamental change (Boiral, 2002; Fazey, Fazey, & Fazey, 2005; S. Wells & Quartey, 2017).

From a knowledge perspective, a core challenge emerges from the ability of organizations to convert tacit knowledge and explicit knowledge in the process of niche construction (see also Binz & Truffer, 2017; Coenen et al., 2010). This conversion is crucial for translating iteratively between experiences and skills (tacit knowledge) and establish instructions and guidelines (explicit knowledge) (Hård, 1994). According to Geels and Deuten (2006, pp. 226–267), this requires translation of "local knowledge into robust knowledge, which is sufficiently general, abstracted and packaged, so that it is no longer tied to specific contexts" (Geels & Deuten, 2006; van Mossel et al., 2018). This has directed previous studies to primarily focus on conversion processes that make tacitly

held knowledge available to a broad range of organizations in various contexts to support experimentations to spread and intensify (Raven & Geels, 2010; Schot & Geels, 2007; Sengers & Raven, 2015). However, to support the confidence of organizations in and their ability to realize sustainability experimentation, conversion also needs to involve translation of explicit knowledge into tacit knowledge, embedding abstract principles in a particular context (Hansen & Nygaard, 2014; Loorbach et al., 2020; Peng et al., 2019).

Thus, attention needs to be paid to the conversion process between and within the two forms of knowledge. To analyze knowledge conversion in niche construction, this research draws on Nonaka and Takeuchi (1995), who conceived of these processes in terms of dynamic knowledge flows, including socialization, externalization, combination, and internalization (see also Canonico, De Nito, Esposito, Pezzillo Iacono, & Consiglio, 2019; Nonaka, 1991; Nonaka & Teece, 2001; Rice & Rice, 2005; Sulaiman, Thummuru, Hall, & Dijkman, 2011). Others have argued that when applying this seminal conceptualization, more attention needs to be given to social interactions among individuals and collectives (i.e., firms) as a source of knowledge generation (Lindkvist, Bengtsson, & Wahlstedt, 2011). Building on these contributions and bringing them into dialogue with research on niche construction, the four knowledge flows can be characterized as (see Figure 4.1):

- **Socialization** describes the conversion from tacit to tacit knowledge, referring to the learning process that allows people to gain knowledge through participating and being there, enacting knowledge, and aligning practical skills and techniques (Nonaka & Takeuchi, 1995, pp. 62–64). Socialization also involves sharing of habitual behavior and the related mental models (Raman & Mohr, 2014; Schot & Geels, 2008).

- **Externalization** describes the conversion from tacit to explicit knowledge, referring to the learning process involved in making personal knowledge accessible to others through conceptualization (Nonaka & Takeuchi, 1995, pp. 64–67), figurative speech, comparison, and the use of symbols to articulate tacit knowledge. This also involves articulation of symbolic and cultural meanings as well as expectations of future benefits and visions (Coenen et al., 2010; Schot & Geels, 2008).

- **Combination** describes the conversion from explicit to explicit knowledge, referring to the learning process that allows people to structure and organize already available knowledge through collecting, combining, synthesizing, and disseminating it (Nonaka & Takeuchi, 1995, pp. 67–69). This involves generalization and codification of practices and principles

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as well as aggregation of articulated knowledge to create a shared knowledge base (Borghei & Magnusson, 2018; Dijk, 2014; Geels & Deuten, 2006).

- **Internalization** describes the conversion from explicit to tacit knowledge, referring to learning processes involved in internalizing already existing knowledge, for instance, learning-by-doing, practically applying, embodying, and operationalizing abstract knowledge (Nonaka & Takeuchi, 1995, pp. 69–70). This also involves translating generic knowledge into practical application changing learned behavior and practices to accomplish specific objectives (Hansen & Nygaard, 2014; Raven & Geels, 2010).

To understand how knowledge conversion supports niche construction processes, this research examines the craft brewing movement. The next section frames craft brewing as an incipient sustainability niche and demonstrates how it contributes to the transformation of the industry.
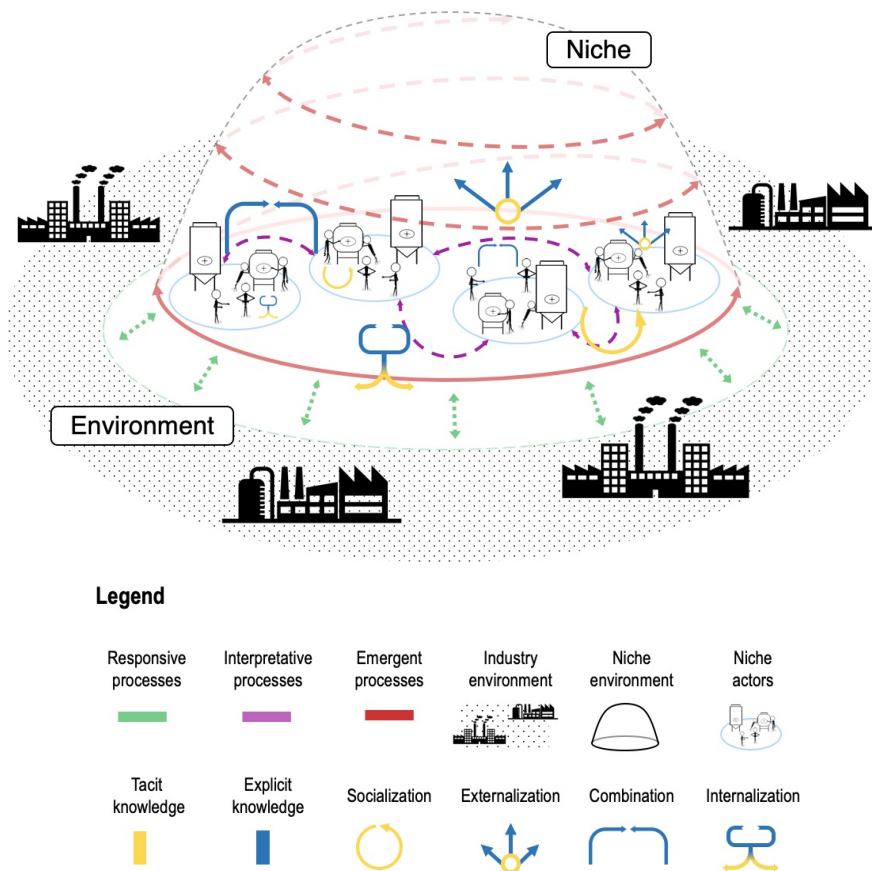
Figure 4.1: Knowledge conversion in sustainability niche construction processes
The figure presents a stylized visualization of conversion flows between tacit (yellow) and explicit (blue) forms of knowledge within niche construction processes that respond to contextual changes (green arrows), create meaning among niche actors (purple arrows), and generate new possibilities through experimentation (red arrows).

4.3 Craft brewing: an incipient sustainability niche

The brewing industry constitutes a sector of the food production system that has seen significant destabilization with the emergence of the craft brewing. The industry and its incumbents are characterized by intense industrialization, internationalized supply chains, and high levels of product homogeneity across regions with four transnational corporations dominating the global market (Ascher, 2012; Garavaglia & Swinnen, 2017; Howard, 2014). Environmental initiatives that industry incumbents publicize primarily serve their growth engines by reducing costs or increasing sales (P. Jones et al., 2013), such technology-focused improvements have been noticed as serving efforts to maintain the status quo (Blythe et al., 2018).

Craft breweries emerged in the United States in the 1960s and developed an alternative approach to conventional industry practices across continents (Garavaglia & Swinnen, 2018a). Craft breweries are small businesses that are independently owned and inspired by traditional and non-industrial production methods. In 1980, 40 major breweries controlled 97.4 percent of the market in the United States, and the eight existing craft breweries had no market share (imports accounted for 2.6 percent) (Elzinga et al., 2015). In 2018, despite a steady decline of per capita annual beer consumption that decreased from 87.4 liters in 1980 to 73.8 liters in 2017 (Gourvish, 1994; Kirin Holdings, 2018), a total of 7,450 craft breweries operated, making up 99 percent of all breweries with a market share of over 13 percent (Brewers Association, 2019; Garavaglia & Swinnen, 2017). Similar dynamics can be observed in other countries such as Australia, Canada, Columbia, Germany, Japan, Italy, Mexico, Netherlands, and Spain (Garavaglia & Swinnen, 2018a; M. Patterson & Hoalst-Pullen, 2014).

Craft brewery-driven niche construction can be framed as "transformative innovations" that enable "shared activities, ideas and objects across locally rooted sustainability initiatives that explore and develop alternatives to incumbent and (perceived) unsustainable regimes that they seek to challenge" (Loorbach et al., 2020, p. 254). Related sustainability experimentation by craft breweries while often studied only as isolated initiatives, may include, for example, relocalizing production and consumption (Fox Miller, 2017), sourcing ingredients locally (Ness, 2018), revitalizing distressed city districts (Barajas et al., 2017; Reid, 2018), generating local multiplier effects on money spent locally (Dangaran et al., 2016), developing local heritage and culture (Argent, 2018; Feeney, 2017; J. Gatrell et al., 2018), as well as driving local employment and strengthening regional economic opportunities (Dangaran et al., 2016; S. R. Miller et al., 2019). At the same time, it is said that the emergence of craft breweries has given rise to a trans-local network, enabling "a rising tide lifts all boats mentality

that facilitated a 'united front' with 'unified goals'" (Mathias et al., 2018, p. 2101, emphasis in original). This shared identity has and is enabled through an ethos of cooperation among craft breweries within an industry that is otherwise fiercely competitive (Datta, 2017; Depenbusch et al., 2018; Lamertz et al., 2016). Yet, it remains unexamined if and how these dynamics contribute to the transformational change that is needed for societies to make progress on sustainability. In the sections that follow, we delve deeper into the dynamics of related niche construction processes to illuminate the knowledge conversion that is at its core.

The next section reports on the case studies, justifies their selection, and elaborates on the research methods to examine how knowledge conversion flows between and within tacit and explicit forms support niche construction in the brewing industry in two local contexts.

4.4 Methods

This research draws on case study analysis to understand how actors mobilize knowledge conversion flows for niche construction (R. Elliott & Timulak, 2005; Macpherson & Holt, 2007; Yin, 2009). This interpretive research approach allowed, first, to capture knowledge as an "idiosyncratic, emergent and active process" that involves tinkering and doing as well as the shared beliefs and habitual actions that are produced and reproduced across niches (Boschma, Coenen, Frenken, & Truffer, 2017; Macpherson & Holt, 2007, p. 186; Raven & Geels, 2010). Second, it allowed us to adopt analytic induction as a method for analyzing gathered material with the aim to empirically test existing conceptualization of knowledge conversion in the context of niche construction (Bansal & Roth, 2000; Martyn Hammersley, 2010).

4.4.1 Research context and case selection

The 'case' in this research is a specific regionally-bounded brewery network (Baxter & Jack, 2008). Although nouns such as 'case' suggest a tangible entity with definite boundaries, the focus of this research was on "the process of 'formulating' a system" of interest, making the boundaries of a case subject to the research (Ison, 2008, p. 140, original emphasis). Two case studies were conducted, one in Canada and one in Germany. The following section offers a description of the varied context before specifying the research methods.

Beer is of cultural significance both in Canada and in Germany (Depenbusch et al., 2018; Weersink et al., 2018; WHO, 2018). Prohibition at the beginning of the 20th century in Canada as well as in Germany the nation's adoption in 1906 of the *Reinheitsgebot* – a beer purity law that initially

restricted brewing ingredients to barley, hops, yeast, and water – have created significant differences in how respective governments and civil society approached beer in more recent history (Depenbusch et al., 2018; Weersink et al., 2018).

In Canada, the brewing industry is amongst the most heavily regulated, and special licenses are required from federal and provincial governments for operating a brewery (Macneill & Bellamy, 2019). Also, the distribution, retail, marketing, and pricing are government regulated. The province with the highest population, Ontario, for example, has the most ridged regulation, limiting distribution to two retailers, the government-operated liquor store and the Brewers Retail; the latter accounts for over 78 percent of sales, is majority-owned by two transnational corporations and is accused of disadvantaging smaller breweries (Lamertz et al., 2016; Weersink et al., 2018). These dynamics, combined with mergers and acquisitions, have created a concentrated market that is dominated by two transnational corporations (Giesbrecht, 2017). In 1984, for the first time after prohibition, the operation of small breweries was permitted in Canada, giving rise to businesses that modeled after craft breweries in the United States (Lamertz et al., 2016). In Canada, craft breweries benefit from progressive federal taxation of beer that favors lower alcohol content and smaller production volume. By 2015, 540 microbreweries operated with an individual annual output of fewer than 5,000 hectoliters, and collectively they accounted for 6% of the Canadian market share (Weersink et al., 2018).

In contrast, Germany has regulated beer consumption and production through taxation instead of special licenses, in line with the purity law, which has been translated into a beer taxation law. It has maintained a fairly fragmented beer market with a strong focus on regional diversification through progressive taxation that benefits smaller producers, and tied-house agreements (i.e., contracts between breweries and their distributing bars) safeguard regional distribution systems (Adams, 2006; Depenbusch et al., 2018). Craft breweries, as known in North America, have gained popularity in recent years, but because of the continued existence of breweries with small production volume, their growth is less pronounced (Depenbusch et al., 2018). While the number of breweries had decreased to 639 by 1990, there has been a resurgence since 2003, and it increased to 1,058 in 2015 (Depenbusch et al., 2018; Gourvish, 1994). In 2015, small breweries accounted for 76.2 percent of the market, with two-thirds producing fewer than 3,000 hectoliters (Depenbusch et al., 2018). A rough estimate suggests North American-inspired breweries make up 1 percent of the market share (Drinktec, 2019).

The niche construction by craft breweries which contributed to the transformation of the Canadian and German beer industry, although being highly industrialized, has not resulted from technological-centered change or brewery-specific innovation incentives (e.g., subsidies, feed-in-tariffs). Instead, it emerged from an alternative mindset that redefined the purpose and practice of brewing (Datta, 2017; Depenbusch et al., 2018; Lamertz et al., 2016). Accordingly, this research examines niche construction that is not driven by policy instruments or technology, but by the ability of small businesses to engage in this socially mediated process.

4.4.2 Unit of analysis and selection

In each case, the unit of analysis is the niche construction process in which breweries engage in by creating, articulating, and utilizing knowledge through individual and collective actions (Baxter & Jack, 2008). The unit of analysis was examined through studying craft breweries, relevant events and activities, and the role of supporting organizations and platforms. The selection involved an iterative four-step procedure. The first step involved the purposeful selection of relevant craft breweries in each case study to identify "information-rich cases for in-depth study … from which one can learn a great deal about issues of central importance to the purpose of the inquiry" (Patton, 2015, p. 264). In total, 30 semi-structured interviews with key informants were conducted between 2018 and 2019 (ORE #22768; see Appendix G for the interview questions and Appendix H for the list of interviews). The second step involved participant and non-participant observation, which were carried out at 36 occasions to investigate informal interaction at events and day-to-day operations (Kawulich, 2005; LeCompte & Schensul, 2013). The identification of respective situations was informed through interviews and secondary data analysis. In the third step, secondary data was gathered from 29 brewery websites (this also informed step 1) and respective social media accounts (6,104 photos and video posts from 28 breweries) to capture self-published accounts and visual depiction of relevant activities. The fourth step involved triangulating the results across the two regionally-bounded networks to improve the credibility of observed niche construction activities in the specific context. Also, interactive meetings with selected craft breweries were carried out to ensure the trustworthiness of the research (Koch, 1994; Lincoln & Guba, 1986; Zhang & Wildemuth, 2009). Across all four iterative steps, the focus was on identifying typical units of analysis to select ordinary illustrations for how knowledge supports niche construction empirically (Patton, 2015; Seawright & Gerring, 2008).

4.4.3 Data analysis

Analytic induction was followed to analyze the gathered material. This required an iterative procedure involving data gathering, analysis, as well as developing and summarizing insights to guide the iteration of this process (Bansal & Roth, 2000; Martin Hammersley, 2011). For the first iteration, gathered material was coded through qualitative content analysis (Elo & Kyngäs, 2008) according to the four categories derived from the literature (i.e., socialization, externalization, combination, and internalization) to identify relevant descriptive activities. This also allowed to contextualize the generic categories and identify where supporting data was insufficient to determine contextual applicability. This informed the next iteration of primary data collection. Also, suggestions from key informants to other (secondary) data sources were considered (e.g., websites, social media presence, podcasts, and online platforms) to complement the previous step, and reflections that emerged from the analysis informed the next iteration. The third iteration focused on completing and adjusting the identified material across the four categories. The analysis shifted toward examining categorial variability to inductively identify new analytical subcategories to better discriminate between different activities that support specific knowledge conversion flows. For this, all activities within a category were compared against each other to identify analytical groupings and define subcategories based on shared purpose and activities. Consistency and accuracy of subcategories, developed following this procedure, were improved through iteratively analyzing all gathered material and by modifying, reformulating, merging, and separating definitions. The application of categories and subcategories to the gathered material was not mutually exclusive.

4.5 Results

The analysis identified general and specific knowledge conversion flows that breweries mobilize for advancing core activities of niche construction. This section draws on both of the examined contexts simultaneously to distill how organizations generate, share, and utilize knowledge conversion flows, to what ends, and by what means. This is not to suggest uniformity between the cases but to lay the foundation for a nuanced understanding of how actors mobilize intangible assets in support of niche construction.

4.5.1 Socialization of knowledge

Socialization of knowledge supports actors as they share and advance skills, expertise, identity, and collective confidence or belief in the niche. Exemplary observations that speak to the process and

objectives of socialization activities are provided in Table 4.1. Related activities support actors to collaboratively engage people and organizations that are new to the niche, refine shared values and procedures that develop collective ways to get oriented and take action toward shared goals, and create a more robust network through building trust and shared experiences. The analysis also provided details on the variance of context in which socialization takes place through relationships that emerge between actors, as illustrated in Table 4.1. This context includes formal education settings, the work environment within a given organization, and social gatherings through events and social clubs.

Based on these observations, analytic induction revealed four groupings of socialization activities based on differences in the learning process and objectives, including (see Table 4.5 for definitions for each subcategory):

(1) *Formal socialization,* which enables the pursuit of predetermined objectives through a defined process. While formal socialization may teach abstract knowledge and help individuals gain proficiency, it also creates an environment that allows people to learn, reflect and embody tacit knowledge (see quotes (1) in Table 4.1);

(2) *Casual socialization,* which allows the accomplishment of objectives unrelated to the intended learning outcomes. Here sharing and embodying tacit knowledge relies on relationships between actors or within a business, supporting learned behavior through which meaningful interaction among niche actors is enabled (see quotes (2) in Table 4.1);

(3) *Informal socialization*, which creates a learning environment that is not guided by formal objectives. It includes participation in social events, 'being there' and 'taking part' ensuring shared personal experiences and relationality among actors across context (see quotes (3) in Table 4.1); and

(4) *Intimate socialization*, which facilitates the pursuit of specific objectives without a formal process. Here socialization enables the acquisition of tacit knowledge through a gradual learning process, as individuals and organizations observe and collaboratively engage with their peers and experts in executing an action (see quotes (4) in Table 4.1).

Table 4.1: Socialization of knowledge in niche construction

		Exemplary quotes Canada	Exemplary quotes Germany
Knowledge conversion flows: Socialization	(1)	"I did level one, two, and three of the beer sommelier course. Part of the last level is to write a beer recipe and brew it at a brewery. So we did that. After that experience and going through the creative process of writing a recipe, I'm appreciating everything that goes into the process from the beginning to that final pint that you drink." (IC2)	"I completed a brewery and malting apprenticeship and a university degree in brewing. I also worked for large beer companies, but through my studies, I realized that beer as a product is what really fascinates me and the experimentation with it. You can't do that at a large company because they produce a product for the mass-market that is to everyone's and no ones' taste. That motivated me to start a small brewery to be closer to the product and the customer." (IG4)
	(2)	"In terms of craft beer and brewing, none of us beyond the brewer have had professional experience. So, we all had to learn this by working with other breweries to gain that experience. When I joined the team five years ago, I took a job at a craft beer bar in the area to work as a bartender because I knew that in our brewery, I would focus on the front of house and I learn about what it means to order beer, how much you go through, the serving and all of that." (IC4)	"The passion for craft brewing emerged during my time in North America when I worked for [brewhouse manufacturer] and visited craft breweries to sell equipment. As a side effect, I often spent the evenings with the brewmasters and conversed about and tasted different beers which reminded me of why I became a brewer in the first place: to enthuse people with this product but this got entirely lost in Germany." (IG9)
	(3)	There was a really great homebrewing group and being with this group and tasting each other's beer and talking about it and knowing that we were all on a certain level and then seeing members of the group open breweries and being successful, and knowing that I was sort of already playing at their level, that really gives you a lot of confidence. It was like an incubator" (IC3)	"We had this homebrewing group, and once in a while, we got invited to have a booth at these craft beer events that were organized by a brewery in the area. I was obsessed with it and it was going really well. So, I thought this could be successful. And then seeing other homebrewers being successful made me want to step into it." (IG10)
	(4)	"When I was working abroad, I made friends with a guy who started his own craft brewery, and once I help him out with yeast that I was growing in our research lab. In return, he offered me to brew my beer at his brewery professionally. And just on a whim, I went from homebrewing to professional brewing." (IC7)	"I still remember the early days when we had our beer brewed by a brewery and the truck arrived with 32 skids of beer, and it was then that we realized how much beer we would be sitting on that expired in six months and we asked ourselves "who would buy all that?" Two weeks later, we had sold all the beer. So, when we built our brewery we decided to install the bigger system because of that experience." (IG8)

4.5.2 Externalization of knowledge

Externalization of knowledge enables actors to articulate a shared understanding and verbalize a common identity to develop a collective narrative for the niche. Observations that illustrate the versatile ability of actors to articulate tacitly held knowledge are provided in Table 4.2. The activities demonstrate the importance of a shared language within the niche, which is informed by an alternative outlook on organizational practices. This not only allows actors to craft new narratives about and from the niche and articulate an ethos that verbalizes organizational objectives. It also enables actors to position the niche in relation to the context by working toward shared goals.

Analytic induction revealed four groupings of externalization activities independent of whether they are linked through a course of action or realized independently, including (see Table 4.5 for definitions for each subcategory):

(1) *Figurative externalization*, which establishes a 'niche language' by creating unique terms and meanings. It enables actors to employ metaphors such as "the rising tide lift all boats" (IC6) to articulate the collaborative ethos within the niche (see quotes (1) in Table 4.2);

(2) *Conceptual externalization*, which was observed in instances where actors merge existing terms into a new phrase that over time can become synonymous with the referenced activity and no longer need explanations. In both contexts, individual breweries develop specific terms to refer to 'collaboration brews' or collaborate with niche outsiders as they source local ingredients as illustrated by the quotes (2) in Table 4.2;

(3) *Visual externalization*, which articulates knowledge that defies verbalization through photo and video sharing applications (e.g., social media platforms). Here, actors are able to decipher tacit understandings and communicate aspects of their identity, beliefs, and practices to other niche members and beyond (see description (3) in Table 4.2); and

(4) *Symbolic externalization*, which transcends the immediate activities that support the sharing of tacitly held knowledge by speaking to broader frames of reference and allowing to display norms and values of the niche (see quotes (4) in Table 4.2). For example, in both contexts, businesses partnered with charity organizations or supported social causes through fundraising not only to bring attention to the particular issue but as a symbolic activity to externalize held beliefs.

While some activities that make tacitly held knowledge explicit may rely on specific means of externalizations (compare quotes (1-4) in Table 4.2), others rely on a combination of different activities. In the latter case, for example, 'collaboration brews' that were observed in both case studies describe a process in which one or more breweries collaborate in the production of a product. Often the products created through these collaborations themselves are used to communicate different aspects of the niche (see quote (2) in Table 4.2), are supported by the participating breweries that visually document the activity on social media (see description (3) in Table 4.2), and are released at special events or festivals that ensure a supportive context for externalizing held values or beliefs beyond the immediate activity (i.e., releasing the new product)(see quote (4) in Table 4.2).

Table 4.2: Externalization of knowledge in niche construction

		Exemplary quotes Canada	Exemplary quotes Germany
Knowledge conversion flows: Externalization	(1)	On the allegory of the 'beer passport': "It's similar to visiting different wineries in one area. It's the same with me, if I go to Vermont, I want to visit a bunch of breweries that are in the area. So that's where it's advantageous to have multiple breweries in a small area because now that person, that beer tourist if you will, is going to all those spots. By working with other breweries and having a beer passport where you collect stamps, it puts us all on a map; I think it's a really good thing." (IC1)	On the allegory of the 'Natürlichkeitsgebot' [natural law]: "Why is it permitted under the purity law [German: Reinheitsgebot] to use technical additives without declaring them but natural ingredients like oats are prohibited? The purity law is dead and needs a fundamental redesign as suggested by the 'natural law' so that you can brew beer with anything that is natural food, but plastic [i.e., Polyvinylpolypyrrolidone] should not be part of it." (IG3)
	(2)	"This [name of product series] focuses on working with local makers. Like maple harvest season is around April, so then teaming up with a local maple farmer to make a maple porter. The local hop producer is owned by two families, so we collaborated with them during hop harvest to bring to people's attention that hops are grown here. From a sustainability perspective, we try to use as many local ingredients that grow in the area." (IC2)	"The [name of product] is a collaborative project among our craft breweries." (IG9) "[Name of product]! Is a joint project among breweries in [city] that is based on a lost tradition from the 1950s. It is unique in the world and we are very proud to join for the first time with our [beer style]" (social media post by IG2)
	(3)	IC3 reposts a picture on a social media platform that was formally posted by IC6 with the following message "IC6 thanks for being a friend" (PC1).	One brewery posts a selfie that also includes a brewer from another brewery to a social media platform to advertise shared participation in a festival (PG1).
	(4)	"We have 82 barrels in house, and we wanted to kind of showcase our beer along with beer from some of the other breweries [in the region] … we organized a festival for barrel-aged beer … that put us on the map. And we pour some amazing beers from [brewery name] and [brewery name] and some of the bigger names in Ontario." (IC5)	"I would compare beer festivals with the feeling that you have on a school trip. Basically, all the brewers from around here participate and we all have fun together, everyone gets along, and we have a great time. We organize tap takeovers, collaborate for the [city] beer day, or last week we had a festival on so we all got together again" (IG8)

4.5.3 Combination of knowledge

Combination of knowledge supports actors in the pooling of expertise and generation of formalized knowledge to establish and share common practices and approaches. Observations that illustrate how actors collect, organize, and share explicit knowledge are provided in Table 4.3. Knowledge conversion flows enable actors to creatively solve challenges that emerge in the process by relying on shared understanding across different organizations involved in the niche networks, spanning local and trans-local contexts and being facilitated through personal relationships, technology, and associations. The analysis revealed related conversion flows to primarily coalesce around technical problems; they also help to establish benchmarks for environmental efficiency (e.g., water consumption), waste diversion (e.g., all of the interviewed breweries worked with farmers to reuse spent grains as animal feed), and reduction of emissions (e.g., some breweries collaborated for ordering ingredients, sharing equipment, or operating a shared delivery vehicle to distribute their product).

Analytic induction revealed four groupings of knowledge conversion flows based on the process of communication and whether an unknown or known problem is addressed, including (see Table 4.5 for definitions for each subcategory):

- *Cumulative combination*, which supports actors by seeking out peers to add their expertise to a solution repository for an encountered anomaly. This may be recorded in writing or is memorized. Across the analyzed material this was more often the outcome of a somewhat unstructured ad hoc process (see quotes (1) in Table 4.3);

- *Integrational combination*, which allows actors to combine insights with the purpose of creating a complete understanding and formalize the process of how to address a specific problem or accomplish a certain output. Sources for such integration are informal meetings and conferences, but also content discussed in podcasts or internet forums (see quotes (2) in Table 4.3);

- *Creative combination*, which enables actors to synthesize existing knowledge to create a new approach to a problem or help develop a new way of doing things. This may involve extended consultation, revisions, and tinkering until a satisfying result is achieved (see quotes (3) in Table 4.3);

- *Disseminative combination*, which allows actors to efficiently and effectively share niche expertise among them through public or private channels. This may include op-eds and magazine articles, periodical literature, books as well as open and closed online forums (see quotes (4) in Table 4.3).

Table 4.3: Combination of knowledge in niche construction

		Exemplary quotes Canada	Exemplary quotes Germany
Knowledge conversion flow: Combination	(1)	"I mean the cool thing about the craft industry is we're pretty tight-knit. I'm friends with a lot of other head brewers or owners. I will bounce questions and problems off them, and we will chat about like, 'hey, have you ever had this happen? What did you do about it?'" (IC1)	"I talk to IG9 because I wanted his opinion on whether or not to bottle beer, because initially, we didn't want to get into it … I know [IG9] from the time when we worked for different brewhouse manufacturers, and we regularly meet during the regional beer festivals. I just called him up to get his opinion." (IG5)
	(2)	"I am also a member of the Master Brewers Association of the Americas and they a really good online forum. You can post questions on it [answers are reviewed for accuracy] and they have a daily digest with the highlights and I read it every day" (IC1)	"We also have internet forums where brewers can ask each other questions, for example, can anyone help me and explain how I adjust the hysteresis on my bottling line to use it for my 0.750 bottles? So, the internet community is a very good basis to find relevant knowledge and develop your professional expertise." (IG6)
	(3)	"I was spending at least 60 to 70 percent of my day just repacking grain [for the homebrewing shop]. I was getting really frustrated. A year ago, I went to a conference and participated in as many seminars as I could fit into the schedule to just talk to people and discuss what I'm doing, and they told me how they do it. Back home, I was like, okay, so a lot of these people are not pre-bagging. The welder next door and I came up with this whole bin contraption that is movable, and we designed a custom racking system so that I don't need to repack grain." (IC6)	"We supervised an undergraduate thesis on the process of hop additions after fermentation to better understand the impact of time, temperature, mixing. We already knew many things, but the specific influence and combination of variables were not entirely clear. It was surprising for me to learn that lower temperatures increased hop solubility." (IG5)
	(4)	"I'm a member of is the Master Brewers Association of the Americas, which is really good. They do a lot of technical conferences, and they publish a technical journal. This is good for getting the staff talking about the science behind brewing and even our customers read it in the taproom." (IC7)	"We have a closed group on [website] and we have a shared online folder for the members of the German Creative Brewer Association [German: Deutsche Kreativbrauer e.V.] to discuss and organize different topics and to facilitate the exchange among us" (IG13)

4.5.4 Internalization of knowledge

Internalization of knowledge supports actors as they translate, contextualize, and recompose learned behavior to recreate and differentiate niche construction across contexts. Exemplary observations that illustrate the different ways through which actors shape, orient, and realize niche construction are provided in Table 4.4. Internalizations of knowledge are enabled through niche experimentation that supports actors to tinker with artifacts and reflect upon interventions and observed changes to deliberate future action to modify the context. As the exemplary quotes in Table 4.4 illustrate, activities that convert explicit to tacit knowledge enable actors to devote attention to the action that they consider meaningful, reflect on its appropriateness to achieve specific goals, and allow learning to emerge from experimentation.

Analytic induction revealed four groupings of knowledge conversion flows based on the location of knowledge that is being internalized (outside or inside of the organization) and the nature of the context in which activities unfold (known or new), including (see Table 4.5 for definitions for each subcategory):

(1) *Contextual internalization*, which enables actors to rely on internally held explicit knowledge to guide action in a new context. Actors may have access to this knowledge through past experiences of individuals who provide generalized insights to orient internal decision-making while the embodiment is mediated through the circumstances that shape new action (see quotes (1) in Table 4.4);

(2) *Referential internalization*, which allows Actors to mobilize explicit knowledge that is available within the organization for better judging a given (known) problem to prioritize objectives or design an appropriate response. Here, actors need to embody transferred knowledge by adjusting abstract principles and benchmarks to contextually relevant procedures (see quotes (2) in Table 4.4);

(3) *Inspirational internalization*, which supports actors as they draw on an idea or model that is successfully working in a different context for realizing it within a new situation. This requires actors to adjust and refine explicit knowledge based on the tacit understanding of contextual characteristics to enable its application under changed circumstances (see quotes (3) in Table 4.4); and

(4) *Supportive internalization*, which empowers actors to engage in external collaborations for gaining access to explicit knowledge that, if adjusted to the respective circumstances, can help resolve a problem at hand. This requires the organization aiming to embody explicit knowledge to learn-by-doing for understanding how instructions relate to the new context and how adjustments may support the internalization of processes (see quotes (4) in Table 4.4).

Table 4.4: Combination of knowledge in niche construction

		Exemplary quotes Canada	Exemplary quotes Germany
Knowledge conversion flow: Internalization	(1)	"Comparing the process here [craft brewery] with my experience at large breweries, it's similar, but you have to understand the difference in scale. For me, water recovery was a priority from the start because I've worked at other [small] breweries where it [cooling water] went down the drain. … Based on my experience [at large breweries], I also designed the brewhouse to minimize pipework to not lose heat when transferring liquid." (IC2)	"I worked in the townships of South Africa before opening the brewery … we translated the gardening projects that we initiated there [townships] into the city by collaborating with the neighboring school to start the gardening project on the brewery rooftop, which honestly is not a new thing … It is more than just increasing self-sufficiency because it provides people a sense of community and local identity, which opens new opportunities for people." (IG2)
	(2)	"One important experience was when I observe a brew day at [brewery name]. I spent a good day with them, brewing, cleaning, whatever, and just seeing how their process works and how the bigger equipment works … I won a homebrew competition at another brewery and brewed my recipe on their system, seeing how they do it, how it's different from the other brewery, that reinforced my understanding of what is the typical operating procedure for this or that." (IC3)	"I worked with [brewery name] in the States, they are the role model for the industry. I'm fascinated by how they became independent from the electricity grid, they recycle more than 99 percent of their waste. That puts our actives into perspective: we use renewable energy and purposefully decided to use bottles that are compatible with the disposable bottle system and won't become landfill after one use. We slowly moving toward the goal of [brewery name] and we now have our first hybrid vehicle." (IG9)
	(3)	"A few of us [founding team] visited [a nearby town], and we stopped by [brewery name] and I was really blown away by how many people were going through there and just the cool vibe and what was going on there; I thought, well, we have a tourist town nearby [where we live], we could do the same thing as long as we find cheap enough rent." (IC5)	"Before we opened our brewery, I was inspired by this [brewery name] in London, UK. One of their operating principles is to focus on local and just do well in your own neighborhood. It has value for people to say 'I'm going to my neighborhood brewery.' When I was in London, I met and discussed the model with the founder and it was really impressive. Seeing that, I thought that's how we should do it here." (IG10)
	(4)	"In the beginning, we were trying to figure out our financial model. We talked to another brewery in the area, and they shared a lot of their numbers and sales figures, which allowed us to build our financial model to anticipate what we were going to sell. We've been really lucky. People want to help." (IC4)	"A whiskey-craft beer truck contacted us because of our successful crowdfunding campaign and they were also thinking of fundraising money this way. So we openly shared our insights, what it actually takes, and what goes into it and guided them through it." (IG6)

Table 4.5 a synthesis of the subcategories of socialization, externalization, combination, and internalization. Building on this nuanced understanding of knowledge, the next section discusses its role in supporting actors to engage in responsive, interpretive, and emergent actions in niche construction.

Table 4.5: Summary of knowledge conversion flows in niche construction

Category	Definition	Subcategories	Description
Socialization	Socialization describes the conversion from tacit to tacit knowledge through shared experiences. It requires participation in the action that is being learned and social interaction.	Formal	Learning occurs when engaged in a structured syllabus with predetermined objectives and pedagogy.
		Casual	Learning is unplanned and acquired by pursuing an unrelated objective.
		Informal	Learning is unintentional and happens when participating in the gathering of social groups and events.
		Intimate	Learning occurs by pursuing a specific objective without any structure that guides how it is achieved.
Externalization	Externalization describes the conversion from tacit to explicit knowledge through articulation. It requires dialogue among people to verbalize (tacit) knowledge that is embodied in people and activities.	Figurative	Using a phrase that caries in addition to its literal definition a separate meaning like a metaphor or double entendre.
		Conceptual	Creating an abstract simplification that describes a specific perspective or process.
		Visual	Visualizing something internal to the niche by making it accessible to outsiders through depictions.
		Symbolic	Using symbols to display shared understandings and identity by communicating more than what is perceived on the surface.
Combination	Combination describes the conversion from explicit to explicit knowledge by integrating and processing available (explicit) knowledge. It requires syntheses, operationalization, and communication to formalize support.	Accumulative	Collecting abstract knowledge by reaching out and adding someone else's expertise to an existing repository.
		Integrational	Combining knowledge to complete the understanding of a specific action.
		Creative	Synthetizing existing knowledge to create a new way of doing.
		Disseminative	Disseminating systematized knowledge through established communication channels.
Internalization	Internalization describes the conversion from explicit to tacit knowledge through learning-by-doing. It requires the embodiment of knowledge through enacting relevant action and engaging in social interaction.	Contextual	Appling the already learned in a new context (also learning-by-doing).
		Referential	Learning in different contexts provides a reference to better understand a given situation at hand.
		Inspirational	Implementing a concept or idea in a new situation that has been observed to work in a different context.
		Supportive	Implementing a new activity by mobilizing support from a third party that has experience in mastering the activity at hand.

4.6 Discussion

This research details the diverse and dynamic role of conversion flows between tacit and explicit forms of knowledge in constructing sustainability niches. As illustrated by the results, knowledge conversion and niche construction are interdependent: conversion flows actively construct spaces for sustainability experimentation, and maintaining such spaces reinforces knowledge conversion (Klerkx et al., 2011; Sulaiman et al., 2011). Previous research on niche construction has often marginalized tacit forms of knowledge due to difficulties involved in capturing and articulating it (Stuiver et al., 2004) which has resulted in a rather static conceptualization of knowledge based on the context of application, for example, in routines and guidelines (e.g., Raven & Geels, 2010; Schot & Geels, 2007). Moreover, explicit knowledge has often been treated as de-contextualized knowledge in research focused on the mechanisms that underpin niche construction outcomes (Geels & Deuten, 2006; e.g., Sengers & Raven, 2015). Contrary, the results of this study demonstrate the fundamentally social and, thus, contextual and place-based notion of knowledge in niche construction processes.

Imparting explicit knowledge in others or absorbing it is contingent in the first place on socialization to support individuals to develop an understanding of the phenomenon in question for comprehending codified guidelines or standards in context (Gertler, 2003; Howells, 2012). Moreover, in line with other research on knowledge flows, we contest the de-personalized notion of explicit knowledge in niche construction, which is often referred to as technical knowledge stored in standards and textbooks. As emphasized through our detailed account of knowledge conversion flows in niche construction, knowledge is fundamentally about individuals that create and mobilize knowledge through experiences and meaning-making that are shaped by social interactions (Amin & Cohendet, 2005; Rutten, 2017).

In response to these observations, we offer a systematic approach to understanding the role of tacit and explicit forms of knowledge in niche construction processes. The findings contribute to previous research by demonstrating that knowledge conversion supports experimentation and niche construction along a dynamic continuum of embodied (tacit) and abstract (explicit) knowledge (Boiral, 2002; Howells, 2012; Nonaka & Takeuchi, 1995). Yet, translation between tacit and explicit forms is not unidirectional (i.e., embodied knowledge is codified to inform new experiments). Knowledge conversion flows that rely on socialization, externalization, combination, and internalization are dynamic (Peng et al., 2019), and so is niche construction that involves responsive, interpretive, and emergent processes (see Figure 4.1). Therefore, we argue that the role of tacit knowledge cannot be confined to the often mentioned but rarely examined, routines and rules that too often distort explicit knowledge as the only knowledge that is readily accessible, instantaneously understood, and smoothly applied (Sengers & Raven, 2015).

Building on these considerations, this section explores how knowledge conversion flows support niche construction processes (see Sections 4.6.1.1 to 4.6.1.3). Section 4.6.2 synthesizes these insights to contribute a more nuanced understanding to existing research on niche construction by highlighting the ability of actors, in particular small businesses, to collectively set priorities and coordinate niche construction within an industry beyond supportive policy instruments.

4.6.1 Niche construction as a responsive, interpretive, and emergent process

Below, we discuss how actors mobilize knowledge to construct niches in response to a (hostile) context (Section 4.6.1.1), generate meaning from and for experimentation (Section 4.6.1.2), and creatively access tangible assets to create new experiments (Section 4.6.1.3).

4.6.1.1 Responsive niche construction: How knowledge flows support actors to create safe spaces for experimentation

The results demonstrate how knowledge conversion supports actors in developing and modifying their context to construct a favorable milieu for alternative arrangements. The way that actors perceive a given situation will arouse a response that is deemed suitable within that context (Joas, 1992; Weick et al., 2005). Knowledge conversion flows support actors in reconstructing situations in ways that make it possible for them to engage in alternative actions and provoke experimentation, which may otherwise not be deemed appropriate.

The results show that externalization of tacitly held knowledge can create the necessary precedents that shape the internalization of new practices, give rise to an alternative reality, and construct conditions conducive to the niche (Kuokkanen et al., 2018). In particular, figurative, conceptual, and visual externalization support the shielding of the niche while also creating an appropriate response to the immediate context in which craft breweries operate. The context of the Canadian case has been shaped by ubiquitous mass-market products that have successfully erased regional differences between breweries and replaced them with brand loyalty of customers toward transnational corporations (Lamertz et al., 2016). While this has marginalized small breweries, figurative externalization enables actors to develop metaphors like the 'beer passport' enabling a response that provokes alternative behavior. Similarly, in the context of the German case, the omnipresent purity law was perceived as constraining the artisanship of small breweries (Eble & de Vries, 2018). In response, the formulated 'natural law' opens a new space for experimentation while acknowledging the historical significance of the criticized regulation. Actors capitalized on the constituted safe space for operating differently through contextual and inspirational internalizations that mobilize explicit forms of knowledge to reshape possibilities for alternative action. In the Canadian and German contexts, actors drew on brewery models from outside of the case studies, which served as a guiding example for operating a business based on alternative principles. This example demonstrates how knowledge conversion supports actors to stretch "the socially accepted (and constructed) boundaries of possibility" as breweries bring an alternative reality into existence and reestablish "ontological and epistemological multiplicity" (Longhurst, 2015).

These observations stress the importance of knowledge as an intangible asset for niche construction while emphasizing the ability of actors to actively shape the context that they are part of. Combining these considerations in light of the analyzed case studies, this research contributes to a better

understanding of how actors are able to foster systemic change. As niche construction is a response to the context in which actors are embedded, craft breweries drive this process through diversifying the existing landscape of production and consumption.

4.6.1.2 Interpretative niche construction: How knowledge flows support meaning-making among actors

The results demonstrate that niche construction is non-teleological (Joas, 1992). In other words, "goals or ends are not external, fixed, or given things that actors strategize to achieve … [they are] interactively, deliberatively, and experimentally derived" (Dewey, 1916; Herrigel, 2010, p. 19). Knowledge conversion supports interpretive action through which actors collaboratively coordinate niche construction and creates shared meaning that directs and nurtures experimentation. In particular, casual, informal, and intimate socialization supports 'niche novices' to become versed in the niche through building meaningful relationships with experts (Hermans et al., 2013). Actors collaboratively externalize these tacit understandings through activities that speak to broader frames of reference (see symbolic externalization) (Boon, Moors, & Meijer, 2014). For example, by collaboratively organizing events, narratives become actualized that portray collective benefits as emerging from improvements of individual actors (Mathias et al., 2018). Through this shared meaning-making, actors recompose conventional arrangements (of the industry) and reinterpret competition as a contest of artistry instead of viewing it from the perspective of a market economy. This shared understanding informs the cumulative and disseminative combination of explicit knowledge as actors support each other by sharing knowledge to help formulate shared goals and solve problems that emerge through niche construction (Järvi et al., 2018). These observations emphasize knowledge as a key asset for actors to engage with interpretive action to understand and shape the orientation of the niche.

The niche goals observed through the empirical case studies are broader and span across areas that are currently not well captured in the literature on niche construction, which is often limited to examining expectations about (future) technology performance (Borghei & Magnusson, 2018; Hermans et al., 2013; Lopolito et al., 2013). Research on grassroots niches led by civil society (outside of industries) has broadened this focus. In this context, scholars argue that goals and the direction of change are shaped by social purpose, identity, and a sense of belonging (Kirwan, Ilbery, Maye, & Carey, 2013; Seyfang, Hielscher, Hargreaves, Martiskainen, & Smith, 2014). Similarly, this research demonstrates that knowledge conversion can support actors, much like grassroots niches, to mobilize their values

and identity through collaborative processes to generate "alternative practices and activities that challenge incumbent societal regimes" (Loorbach et al., 2020, p. 252).

4.6.1.3 Emerging niche construction: How knowledge flows support actors to creatively generate new niche possibilities

This research demonstrates the importance of knowledge conversion for supporting actors in mobilizing and accessing tangible assets for niche construction. Actors generate access to tangible assets in the processes of solving concrete problems that afford "conceiv[ing] of an alternative and new range of goals and possibilities" (Herrigel, 2010, p. 20; Joas, 1992). As stated previously, access to resources is a crucial challenge for small businesses to effectively contribute to sustainability (Burch et al., 2016; Stubblefield Loucks et al., 2010). This is complicated in the analyzed cases as craft brewing is a technically advanced industry, requiring capital intensive equipment and advanced scientific understanding (e.g., chemistry, engineering, logistics, etc.) (Cabras & Bamforth, 2016). The analyzed organizations creatively circumvented emerging problems by mobilizing knowledge conversion to make tangible assets accessible (e.g., equipment, capital, networks, ingredients, etc.). For example, brewers who were socialized in homebrewing clubs (see informal socialization) experimented with upscaling homebrewing systems to commercial operations, instead of downscaling large industrialized brewery equipment. This challenges the common assumption that opening a small brewery is necessarily a capital intensive endeavor (>1 Mio USD) (McKean, 2012). Furthermore, this emphasizes the important role of tacit knowledge in improving the ability of actors to creatively solve problems.

Similarly, the collaborative ethos that craft breweries collectively externalize enables small businesses to benefit from otherwise inaccessible resources, as illustrated by this quote: "*We had to calibrate our fermentation tanks for the Revenue Agency, but this requires an expensive device, so one person in our network recommended us to contact a brewery in the area, and so we called them up and explained who we are because they didn't know us and they just let us borrow it for free*" (IC3). In this way, knowledge conversion can generate tangible network effects for actors that benefit from existing assets through a "pay-it-forward mentality that encouraged helping, rather than hindering, new entrants" (Mathias et al., 2018, p. 3105). Access to such tangible assets is enabled through a 'deep niche network' that is maintained through the combination of knowledge (see integrational and creative combination). The analysis revealed how actors drew on this network for solving the shortage of ingredients by borrowing from other small businesses. Accordingly, actors can

collectively maintain and improve niche functions (i.e., the services, goods, and opportunities), generating new possibilities through creatively solving problems imposed by the inaccessibility of tangible resources.

These observations call attention to the genealogy of tangible and intangible assets that support actors to overcome problems in niche construction. A key contribution resulting from these insights is that new possibilities for niche creation are dependent on the ability of actors to create access to assets rather than on their mere existence. Understanding how assets are made available calls for future research to shift the focus from examining conditions that enable or constrain access to tangible assets (e.g., the existence of networks, funding, pilot projects) to researching how actors creatively bring tangible assets into service of new experiments.

4.6.2 Industrial grassroots niches foster sustainability beyond policy support

Actors can collaboratively engage in niche construction within the realities of markets and industrialized sectors. The focus on knowledge conversion flows among craft breweries reveled dynamics that are otherwise reported in research on grassroots innovations (Ornetzeder & Rohracher, 2013; Seyfang & Smith, 2007). In the analyzed cases, actors expressed social and cultural meanings that depart substantially from conventional understandings: 1) actions inform and are informed by ideals; 2) initiatives develop from and engage community groups; and 3) motivation for supporting niche activities is derived from peer recognition and a sense of belonging, all of which are features of grassroots-led change (Seyfang & Smith, 2007; Wolfram, 2018). Yet, the examined actors only generate income through commercial activities that are enabled through the niche (as is the case for market-based innovation). Accordingly, the analyzed cases provide evidence for the existence of industrial grassroots niches that necessitates both collective coordination and market processes.

The concept of industrial grassroots niches brings to the fore the collective ability of small businesses to generate 'transformative innovations' that develop viable alternatives to industry incumbents (Loorbach et al., 2020). The empirical research of this study highlights that actors engage in niche construction as they formulate shared goals and solve problems outside of conventional industry approaches and, as a result, generate alternatives arrangements (Järvi et al., 2018). By examining knowledge conversion flows, we demonstrated that actors are capable to self-organize, draw on their collective ability in generating novel arrangements, and shape the direction of change beyond mere monetary incentives. These findings offer a more nuanced understanding of a common assumption in the literature that "public policy must play a central role in shaping the directionality of

transitions through environmental regulations, standards, taxes, subsidies, and innovation policies"
(Geels, 2011; Köhler et al., 2019, p. 3; Lopolito et al., 2013; Schot & Geels, 2007; Verhees et al.,
2015). Our research also contributes to the emergent scholarship on transformative entrepreneurship
that emphasizes the ability of small businesses to accelerate sustainability transformations to better
understand how actors can transform the industry that they are part of (Burch et al., 2016; Westman et
al., 2019).

4.7 Conclusion

This article has systematically explored the role of knowledge in sustainability niche construction
processes. Drawing on empirical research, we examined how knowledge conversion between tacit
and explicit knowledge is mobilized by craft breweries – small independent businesses – that drive
niche construction in Canada and Germany. Instead of separating tacit and explicit knowledge forms
based on activities (e.g., practical intervention and sharing of codified insights), the developed
framework emphasizes that knowledge supports experimentation and niche construction along a
dynamic continuum between embodied and abstract forms of knowledge. Building on this dynamic
understanding, we illustrated how conversion flows (socialization, externalization, combination, and
internalization) are at work in niche construction processes. Knowledge conversion flows support
actors to 1) respond to and transform the context in which they operate, 2) collectively formulate
goals that shape the direction of change, and 3) bring tangible assets into service for experiments to
realize new possibilities. Both forms of knowledge – tacit and explicit – are equally important for
constructing niches as they help actors to develop deep networks to engage novices and experts, a
shared language to articulate values and beliefs, collective intelligence to codify guidelines and
practices, as well as experimental approaches to recast social arrangements. We argued that it is not
knowledge per se but the dynamic conversion between tacit and explicit forms, that is at the center of
niche construction processes. Knowledge flows support actors in generating systemic change,
challenging incumbent arrangements, and accessing tangible assets in constructing the conducive
milieu for sustainability experiments to flourish.

Acknowledging the equal yet differentiated importance of knowledge conversion flows offers new
perspectives on the potency of niches in supporting change toward sustainability. Future research can
mobilize these insights to examine the ability of a given niche to build shared knowledge assets and
develop learning processes – or why it fails to do so. This article calls attention to the creative ability
of private actors to instigate and advance niche construction beyond the support of innovation policies

and incentives. As demonstrated, small businesses can coordinate niche construction in a grassroots fashion with success or failure being determined by their collective ability to set priorities and shape directions of change through sustainability experimentation.

Chapter 5

Entrepreneurial Action for Sustainability Strategies: Reconstructing the Journey of Two Small Craft Breweries

Abstract

Sustainable entrepreneurship has been well-founded and conceptualized in research as a process through which businesses can creatively provide environmental, social, and economic value. Even so, the literature is largely missing empirical examinations that systematically explore the journey through which entrepreneurial actions support sustainability strategy formation and evolution. Such empirical examination would provide crucial insights into how entrepreneurial action direct organizational change toward sustainability. This research reconstructs the entrepreneurial journeys of two small businesses in the brewing industry to detail the emergent qualities of sustainable entrepreneurship. The findings demonstrate how sustainability strategies evolve from purposeful and open-ended journeys where intentional entrepreneurial action reflexively mobilizes contextual opportunities into an emergent strategic orientation. The discussion develops these observations to inform a process approach to understand how entrepreneurial actions support sustainability strategy, emphasizing the need for reflexive relationships between business goals, bridging elements that help navigate resulting tensions, and a dialogical approach to learning

5.1 Introduction

Entrepreneurs in small businesses can significantly contribute to transforming society toward environmental, social, and economic sustainability (Gomez et al., 2015; Muñoz & Cohen, 2018). Particularly sustainable entrepreneurs are increasingly recognized for their potential to support society to develop along more sustainable trajectories (Burch et al., 2016; Muñoz & Cohen, 2018; Schaltegger, Lüdeke-Freund, & Hansen, 2016). For this potential to be realized, sustainable entrepreneurs need "strategic orientation with respect to the introduction and implementation" of new practices and attitudes to develop solutions that address the underlying roots of unsustainability (Baumgartner & Rauter, 2017, p. 81; Kurucz et al., 2017). While many examples exist illustrating what sustainable entrepreneurship can accomplish (Choi & Gray, 2008; Schaltegger et al., 2016); less is known about the process of how entrepreneurs develop sustainability strategies to navigate the challenges involved in orienting their business toward sustainability (Galpin & Hebard, 2019; Wiesner, Chadee, & Best, 2018; Zollo et al., 2013).

How entrepreneurs develop sustainability strategies for and from evolving their business to enable fundamental change, in particular in small enterprises, remains elusive (Fortis, Maon, Frooman, & Reiner, 2018; Muñoz & Cohen, 2018; Zollo et al., 2013). While the majority of large, multinational corporations have developed control mechanisms to implement sustainability strategies effectively, smaller businesses often lag behind in such efforts (Crutzen, Zvezdov, & Schaltegger, 2017; Haanaes et al., 2011). Reasons for this difference could be the simpler organizational structure, lack of resources, and lower levels of stakeholder pressure, that taken together, may explain why small businesses operate "on a day-to-day basis and do not plan or act strategically" (Barbosa, Castañeda - Ayarza, & Lombardo Ferreira, 2020; Kraus, Kauranen, & Reschke, 2011, p. 65; Lewis, Cassells, & Roxas, 2015; Stubblefield Loucks et al., 2010). Yet, small businesses that exhibit a strong entrepreneurial orientation, as they innovate, proactively address challenges, and take risks, are more apt to implement sustainability strategies (J. Jansson, Nilsson, Modig, & Hed Vall, 2017). This draws attention to how entrepreneurial action supports small businesses to develop "sustainability-oriented behavior and how this is reflected in their strategic ambition" which has been identified by many as a critical area for future research (D. Fischer, Brettel, & Mauer, 2020, p. 87; Fortis et al., 2018; Muñoz & Cohen, 2018; Zollo et al., 2013). This question of 'how' draws attention to action processes and "practice in sustainable entrepreneurship… [that is] a neglected area of study" (Muñoz, Janssen, et al., 2018, p. 327; Zollo et al., 2013); moving away from definitional 'what' questions that describe the

manifestation of sustainability strategies (e.g., Ageron, Gunasekaran, & Spalanzani, 2012; Engert & Baumgartner, 2016; Wilson, 2015) and motivational 'why' questions that explore the driving values and beliefs in entrepreneurs (e.g., Eide, Saether, & Aspelund, 2020; Tollina & Vejb, 2012).

To address this gap, this research provides an in-depth examination of the role of entrepreneurial action in realizing sustainability strategies that inform and are informed by "business opportunity developed through co-evolving social dynamics in sustainable ventures" (Mcmullen & Dimov, 2013; Muñoz & Cohen, 2018, p. 316). This research examines the entrepreneurial journey through which an enterprise evolves toward sustainability by conducting a detailed, in-depth study of two small businesses in the brewing industry. The qualitative and longitudinal case studies demonstrate the interrelated process of how entrepreneurs intentionally design, collectively enact, and contextually realize action in the process of crafting sustainability strategies. This research seeks to address the question of how entrepreneurial action supports small businesses in the formation and evolution of sustainability strategies

This research makes significant contributions to research on sustainable entrepreneurship and sustainability strategy. Our empirical analysis contributes to a more nuanced understanding of the entrepreneurial journey and how strategic orientation toward sustainability emerges in small businesses over time, beyond chronological determinism. Based on the results, we argue that entrepreneurs form and evolve sustainability strategy through reflexive and deliberate action, strategic bridging between emerging tensions, and multi-stakeholder dialogue. The findings open new avenues for research focused on the recursive nature of entrepreneurial action and sustainability strategy for better understanding small business journeys toward sustainability.

The remainder of this article is organized as follows: Section 5.2 elaborates on how sustainable entrepreneurship can support sustainability strategy. Section 5.3 reports on the engaged scholarship methodology of this research as well as elaborates on case specifics and case selection. Section 5.4 details the results through thick descriptions of the two reconstructed entrepreneurial journeys. The discussion, in Section 5.5, returns to the research question and reflects on key entrepreneurial elements in developing sustainability strategies in small businesses.

5.2 Entrepreneurial action for sustainability strategy

Research on sustainable entrepreneurship and sustainability strategies addresses different yet interdependent organizational dimensions. The former emphasizes the actors involved in utilizing

economic opportunities for value generation through action in support of ecological integrity and social justice (Gibbs, 2006; Schaltegger & Wagner, 2011). The latter encompasses the social, environmental, and economic goals that inform organizational development and guide businesses' long-term orientation to generate corporate and social value (Epstein & Roy, 2001; Galpin & Hebard, 2019). Bringing together these research strands allows us to capture how individuals and collectives skillfully mobilize action in the process of realizing strategic change for sustainability (Baumgartner & Rauter, 2017; Wiedner, Barrett, & Oborn, 2017). In this section, we explore the integrated notion of *entrepreneurial action for sustainability strategy*, which sees both concepts as interdependent and mutually reinforcing dimensions of the entrepreneurial journey towards sustainability.

Sustainability strategy is often differentiated into strategy formulation and implementation with the assumption that "strategy should precede action" (Engert, Rauter, & Baumgartner, 2016; Galpin & Hebard, 2019, p. 169). Based on these considerations, research has focused on the management level to develop supporting tools and models for businesses to "strategically insert, operate, and control sustainability throughout their activities" (Barbosa et al., 2020, p. 9; Baumgartner & Rauter, 2017) or analyze discrepancies between formulation and implementation (Centobelli, Cerchione, Esposito, & Shashi, 2020; Engert & Baumgartner, 2016; Hengst, Jarzabkowski, Hoegl, & Muethel, 2020). Complementary scholarship has emphasized the "idiosyncrasies" of people, relationships, and interactions involved in the journey that entrepreneurs engage in when strategically orienting their businesses (Papagiannakis et al., 2014, p. 267). Such research suggests the journey of a business toward sustainability as an "evolutionary process," emphasizing the actors and their actions involved in strategy development and refinement (Zollo et al., 2013, p. 243). Similarly, conceptualizations of entrepreneurship have suggested opportunities to "emerge out of the enactment process itself" instead of assuming entrepreneurs to have *a priori* knowledge of strategic orientation (Alvarez & Barney, 2010, p. 573). Accordingly, entrepreneurial actions for sustainability strategy need to be both deliberate and reflexive to help businesses navigate the challenges involved in realizing organizational change (Neugebauer, Figge, & Hahn, 2016; Zollo et al., 2013).

Sustainable entrepreneurs ultimately need to balance economic, social, and ecological sustainability (also known as the triple bottom line) (Bansal, 2002; Belz & Binder, 2017; J. K. Hall, Daneke, & Lenox, 2010). Yet, these aspects "tend to compete for dominance" and therefore are often subordinated under a single strategic goal (e.g., environmental protection and social justice are subordinated to profitability) (de Clercq & Voronov, 2011, p. 335; Klewitz & Hansen, 2014). While

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this has led to a dualistic treatment of tensions with the assumption that they are only resolved through win-win approaches, trade-offs, or constraining of competing interests, little attention has been given to how conflicting goals can be achieved simultaneously to accommodate the three interrelated aspects (Hahn, Preuss, Pinkse, & Figge, 2014; Van der Byl & Slawinski, 2015). Embracing tensions between sustainability aspects through a paradoxical lens suggests strategies as dependent on the ability of sustainable entrepreneurs to address emerging conflicts through business operations, thereby elevating "environmental and social concerns as an end in themselves, [and] not just as a means to the end of profit maximization" (Hahn et al., 2018, p. 235). This positions entrepreneurial actions as an integral part of strategy formation and evolution, to orient business operations in ways that help address contradictions inherent to sustainable ventures (Soderstrom & Heinze, 2019; Wannags & Gold, 2020).

Stakeholder dialogue plays a mediating role in strategy formation and evolution by helping to negotiate the strategic orientation and frame of reference, and engaging new actors that may support the realization of business goals (Colbert & Kurucz, 2007). Research on large corporations has shown that dialogue with external stakeholders has primarily instrumental value for marketing, reputation building, and proactively addressing risks (López & Monfort, 2017; Van Huijstee & Glasbergen, 2008), while internally the dialogic ability of managers helps built shared strategic orientation across subsidiaries and develop a business culture conducive to the envisaged strategy (Engert & Baumgartner, 2016; Galpin, Whittington, & Bell, 2015; Mazutis & Slawinski, 2008). In contrast, strategic dialogue with external stakeholders may be rendered less relevant to small businesses due to the lack of resources for deliberate reputation building and the dominant focus on highly personalized internal engagement (Abimbola & Kocak, 2007; Stubblefield Loucks et al., 2010). Yet dialogic actions represent a "core mechanism" for fundamental organizational change that drives the entrepreneurial journey toward sustainability, because of the ill-defined process and goals, and dilemmas and conflict are inherent to its undertaking (Argyris & Schön, 1978; Mazutis & Slawinski, 2008, p. 438). Entrepreneurial actions for sustainability strategy are thus dialogic in nature, holding the potential to create new opportunities through conversations proactively (Fletcher, 2006; Hofstra, 2007; Kurucz, Colbert, & Wheeler, 2013).

This brief review demonstrates that entrepreneurial action is integral to sustainability strategy and essential to navigating the business journey toward sustainability. Yet, it is not clear how sustainable entrepreneurship and sustainability strategy are empirically linked through the entrepreneurial journey

toward sustainability. In particular, in small businesses this journey is poorly understood; insights into how deliberate and dialogic actions create emergent possibilities over time that enable strategic orientation to embrace context-specific tensions remain elusive.

5.3 Methods

This research builds on a comparative, longitudinal case study of two craft breweries to understand the role of entrepreneurial action in evolving businesses toward sustainability (R. Elliott & Timulak, 2005; Mcmullen & Dimov, 2013; Yin, 2009). This approach was adopted to generate "thick, detailed descriptions of actual actions" that support the entrepreneurial journey and "recover and preserve the actual meanings that actors ascribe to these actions and settings" as this constitutes an under-researched area (Belz & Binder, 2017; Gephart, 2004, p. 456). This also addresses the risk involved in process tracing or logic models to oversimplifying the entrepreneurial journey as a linear process (Etzion, 2018; Fletcher, 2006). Moreover, it offers a direct response to the call for mobilizing empirical research to solidify inductive theory development that has shaped sustainable entrepreneurship over the last decade (Muñoz & Cohen, 2018) and addresses the lack of "comparative studies into management control, strategy and sustainability" that focus on small businesses (Crutzen & Herzig, 2013, p. 182). A critical case sampling strategy was followed to purposefully select two small businesses that would "yield the most information and have the greatest impact on the development of knowledge" (Patton, 2015, p. 256). This allowed the study to address the "fact that the sustainable entrepreneur is not as prevalent" as other types of entrepreneurship (Muñoz & Cohen, 2018, p. 315). The research process was organized around a three-step procedure that involved 1) context selection; 2) case selection; and 3) data gathering, analysis, and synthesis.

5.3.1 Research context

The brewing industry was selected as the topical area. While this sector has become highly industrialized and competitive over the last century, the inception of craft brewing entrepreneurs in the previous three decades changed production and consumption around the world (Elzinga et al., 2015; Garavaglia & Swinnen, 2018a). The term craft brewing refers to a business with relatively small production size, that is privately owned, and where production methods are inspired by historical procedures and non-industrial approaches (Acitelli, 2013; Brewers Association, 2014). Two observations supported this aim; first, entrepreneurial action of craft breweries move beyond technological aspects and extend to the business purpose, involving co-creation and contextual

realization of purposeful social change (J. Gatrell et al., 2018; M. Patterson et al., 2016). Second, these dynamics are not limited to a small number of laudable initiatives (as it might be with other purpose-driven entrepreneurs such as B Corp certified organizations), but essentially define the core identity of the majority of craft brewing entrepreneurs (E. Jones, 2018; Ness, 2018; M. Patterson et al., 2016). Therefore, understanding how these entrepreneurs generate meaning from and implement sustainability provides valuable insights into the role of knowledge and action in forming and evolving sustainability strategies.

Canada and Germany were selected as the research contexts as craft brewing has become an influential challenger to the dominant, large-scale, heavily industrialized model of beer production in both contexts. This selection ensured contextual variation between selected cases. The globally connected brewing industry developed along significantly different trajectories in Germany and Canada, creating different settings for craft breweries to emerge and operate while beer considered a culturally significant beverage in both contexts (Depenbusch et al., 2018; Weersink et al., 2018). The Canadian context continues to be shaped by prohibition that banned production and sales of alcoholic beverages in the early 20th century, and prohibited the operation of small breweries until 1984; mergers and acquisitions have resulted in two transnational corporations that account for 50 percent of the market share in 2018 (Couillard, 2019). In Germany, the *Reinheitsgebot* – a beer purity law that initially restricted brewing ingredients to barley, hops, yeast, and water – was adopted nationwide in 1904, which restricts brewing ingredients to barley, hops, yeast, and water. Furthermore, tied house agreements (i.e., exclusive contracts between breweries and pubs) contributed to the creation of a comparatively fragmented market that has been continuously shaped by regional breweries as well as small breweries (defined by production volume of <10,000 hectoliters). In Germany, the 1,058 small breweries operating in 2015 accounted for 76 percent of the market share (Depenbusch et al., 2018). Yet, in both contexts, craft breweries that have been founded are modeled after similar business models that emerged in the late 20th century in the United States.

5.3.2 Case selection

Cases were identified by examining two geographically bounded brewery networks in Southwestern Ontario (Canada) and Northern Germany. In each network, semi-structured interviews that lasted, on average, 1.5 hours (10 and 11 interviews in the Canadian and German network respectively) and site visits (13 in each network) were carried out in 2018 with relevant breweries that were identified through internet search and document analysis. Based on this initial research, one brewery was

selected in each network based on its relation to its respective context (similarity in breaking new ground) and to each other (difference in years of operation) (see Table 5.1 for a comparative overview of both businesses).

Table 5.1: Overview of the two analyzed businesses

	Case A Germany	Case B Canada
Founding date	1906	2013
Number of employees	Three family owners, three full-time employees, 12 part-time employees	Nine worker-owners (three of which have a full-time position), occasional hour-based employees
Business form and model	Family-owned brewpub that produces two traditional beer styles as well as selected seasonal and craft beer styles. Ingredients are sourced regionally or are organic certified.	Worker-cooperative that produces a broad variety of different beer styles and sources some of the ingredients locally.
Context-specific challenge	Transforming a traditional brewery and restaurant with a strong focus on sustainability in a context where craft breweries only emerge as newly founded businesses.	Founding an employee-owned and operated craft brewery with a strong focus on sustainability in a context where co-operative breweries did not exist.
Examined time period	2009-2020	2013-2020

5.3.3 Data collection, analysis, and synthesis

This research employs engaged scholarship (P. Wells & Nieuwenhuis, 2017) to support the in-depth, interpretive analysis of the entrepreneurial journey through collaborative research where the data is iteratively collected and analyzed in collaboration with the research participants (Van de Ve, 2007). We combined retrospective with real-time analysis to examine an extended period of the journey (Case A: 11 years; Case B 7 years), with the last two years being observed on an ongoing basis (Mcmullen & Dimov, 2013). We gathered data primarily through semi-structured interviews, with the key respondents being business owners because of their multiple roles (e.g., management and staff) and knowledge about the strategic orientation of the firm. In total, eight semi-structured interviews were carried out, each lasting between 1.5 and 2h that focused on 1) business purpose and history, 2) process challenges and catalysts of the journey, and 3) external collaboration. To ensure the trustworthiness of the research, prolonged engagement, triangulation, peer debriefing, and member checking was conducted (Lincoln & Guba, 1985). We triangulated interviews with archival material, including newspaper articles, internal documents, and company newsletters, as well as two site visits conducted in 2018 and 2019 (see Table 5.2). Multiple iterations of feedback were carried out to accurately represent research participants' experiences and enable co-construction of findings to develop and refine data synthesis.

The gathered material was examined through qualitative content analysis to assign observations to relevant dimensions of entrepreneurship and strategy that were derived from the literature (Elo & Kyngäs, 2008; Mayring, 2000). To understand the "process of sustainable venturing as a holistic analytical unit" contributions to entrepreneurship and strategy have elucidated three dimensions, including content, process, and context (Baumgartner & Rauter, 2017; Colabi & Khajeheian, 2018; de Villiers Scheepers, Verreynne, & Meyer, 2014; Mazzei, 2018; Muñoz & Cohen, 2018, p. 316; Pettigrew, 1987). Yet, entrepreneurial action for sustainability strategy needs to address normative aspects, supporting intentional considerations (content), collaborative aspects (process), and contextual requirements (context) (Caniglia et al., forthcoming; Etzion et al., 2017; M. Stubbs, 2000). Accordingly, the three dimensions were defined as:

- Entrepreneurial actions that support **intentionally designed** sustainability strategy need to create environmentally and socioeconomically improved situations and increase future opportunities, which require their prioritization and proactive alignment (Schaltegger, Beckmann, & Hockerts, 2018; P. Wells, 2016).

- Entrepreneurial actions that support **collectively enacted** sustainability strategy need to move beyond the narrow focus on stakeholder wealth and re-envision what collective value creation involves, which requires questioning of established ways of doing and enacting alternative frames of reference (T. Busch, Hamprecht, & Waddock, 2018; D. Fischer et al., 2020).

- Entrepreneurial actions that support **contextually realized** sustainability strategy need to be embedded in and tailored to local needs and expectations, which require experimental approaches to learning and building of alliances (Dogan & Walker, 2008; M. Stubbs, 2000; Westman et al., 2019).

These three dimensions provide a dynamic framework for understanding the role of entrepreneurial action in navigating the business journey toward sustainability (see Appendix I for subcategories). To develop a dynamic storyline for each case, gathered material was coded using NVivo (QSR International, 2020) and subsequently organized and synthesized through thick descriptions (Geertz 1973; Denzin 2001). The particulars of the evolving case stories were assessed for how relevant concepts such as *prescriptive*, *co-created*, or *situated* knowledge manifested (see Appendix I), and how they supported entrepreneurial action in the process of strategy development. These

manifestations were identified, collected, and synthesized. The initially developed storyline was revised and rewritten based on follow-up interviews and meetings.

Table 5.2: Overview of the data collection process

	Interviews	Site visits	Internal documents	Newsletters	Social media posts	Newspaper reports
Case A (Germany)	4	2018-19	1	27	27	7
Case B (Canada)	4	2018-19	1	0	361	12

5.4 Results

This section explores two case studies to examine how entrepreneurial action supports sustainability strategy formation and evolution. The cases are presented along the three dimensions of intentional design, collective action, and contextual realization. Each of the case descriptions focuses on how entrepreneurial action was designed and carried out, who was involved, and how they were oriented and realized considering the context. The aim is not to provide an assessment of the implemented strategy. Instead, we offer thick descriptions of the entrepreneurial actions involved in strategy formation and evolution, focusing on the ascribed experiences and meanings

5.4.1 Case A: history and tradition 'stoke the flames' of organizational change

The brewery in Case A is a traditional German brewpub (in German, Gasthausbrauerei) that operates on-premise a brewery, distillery, and restaurant. The business, which has always been family-owned, was founded in 1906, and since 1984, it has been owned and operated by the third generation. In 1993, the owners added a brewhouse to the restaurant, followed by a distillery in 1999. In 2009, the current owners and their son engaged in action to restructure the brewpub to ensure long-term economic viability and, as a result, transformed the business toward sustainability. This process was complicated by the rich history of the business and the family ownership structure. Over the years, the restaurant menu had grown by offering an ever-expanding list of goods and services which, from the perspective of the family-owners, undermined its unique value proposition. Continued experimentation, reflection, and deliberate change processes enabled the entrepreneurs to orient the business as a purpose-driven enterprise along the guiding principle of transparency as well as to realize their aim to offer an authentic German brewpub experience and to keep the local beer culture alive.

5.4.1.1 Intentionally designing entrepreneurial action for sustainability strategy

The prioritization of the kind of action that would support working toward the business aim required extended conversations among the multi-generational owners to navigate the diverse and historically grown interests in the brewpub. The area that was prioritized for experimentation to redefine the value proposition of the brewpub was the restaurant's menu, which, at the time, "resembled the city's telephone book."[4] The reorganization and streamlining of the menu based on an ABC-analysis (i.e., Pareto-based rationalization method) generated extended discussions over which items to keep and which to remove. This process of negotiation was an "emotionally charged fight" involving "all sorts of things to bargain for on each and every item: 'If we stop offering the ham sandwich, Mrs. Müller won't come anymore.' But we all had forgotten that Mrs. Müller died long ago." These conversations and the experiences gained through the restructuring process led the owners to collaboratively develop a mission, which was formalized in 2015, to guide future action to position the brewpub as a "culinary and cultural island in the ocean of the arbitrary and petty regional cuisine and anonymity of industrialized production" (internal mission document). This mission focused on three business domains, including beverage, food, and cultural experiences (see Table 5.3). The mission tasked the entrepreneurs with demystifying beer as a product, focusing on regional and seasonal meal options, and furthering the use of the brewpub space to organize cultural events.

The restructuring of the restaurant's menu initiated change processes in other areas of the business that informed strategic action in support of the business' mission. For example, offering a reduced number of menu items allowed the use of fresh ingredients in the kitchen, which eliminated the need for extended freezer space and resulted in the removal of five commercial freezers and decreased energy costs. The family-owners also stated that the reduced menu slowed down the kitchen pace as staff members spent less time searching for frozen ingredients, which increased employee well-being. These changes created opportunities for locally sourcing ingredients and initiating collaboration with local farms. With the emerging reorientation of the restaurant and the strengthened local relationships, the entrepreneurs redesigned the menu in 2010. They started, besides explaining the company's history, to list all suppliers of the brewpub in the menu as well as on their website. This emphasis on transparency was well received by their customers and their suppliers as it created an additional platform for the promotion of locally grown produce. In 2011, the regional Ministry of Agriculture

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[4] Direct quotes are lifted from semi-structured interviews with the co-owners if not specified otherwise.

recognized the brewpub for these efforts by awarding its 'regional focus.' This award acted as a catalyst to elevate transparency as a guiding principle for transforming the business.

Entrepreneurial action across the three business domains (see Table 5.3) helped shape an alternative way to approach and operate the brewpub as the family-owners envisioned its "history and tradition not as preserving the ashes, but stoking the flames" (internal document). In the domain of brewing, the entrepreneurs situated "beer as a cultural asset to span a bridge from culinary enjoyment to cultural meaning." This informed experimentation with brewing courses and tastings and initiated collaborations with other breweries focused on sharing supplies, co-marketing of products, and participation in festivals, breaking with the historically grown concept of competition in the industry. This created opportunities to build and strengthen a business network focused on raising awareness for craft beer and reinvigorating the German beer culture. In the food domain, the brewpub assumed the role of a food hub with the revised menu popularizing locally food. Moreover, the entrepreneurs started to host a weekly farmer's market in the brewpub as a way to support the creation of an alternative food network. In the culture domain, the brewpub has established itself as a "cultural island" for unique concerts and literary evenings and has become a regular stage for some renowned German artists.

Table 5.3: Case A – Overview of the focus areas

Strategic focus areas	Strategic goals
Beverage experience	Offering: Hand-crafted beer Hand-crafted liquor Unique non-alcoholic beverages Unique hot beverages
Culinary experience	Focusing on: Regional cuisine and selected seasonal dishes Vegan and vegetarian-friendly High-quality ingredients Transparent supply chain
Cultural experience	Focusing on: Demystify craft beer Bring alive the business history Offering a German brewpub experience Creating a cultural island for concerts and educational events Providing high-quality service

5.4.1.2 Collectively enacting entrepreneurial action for sustainability strategy

Action in support of increasing the transparency of internal and external business processes supported the brewpub to interrogate and redefine social arrangements. From the perspective of the owner family, the brewery has been marginalized by the industrialization of the brewing sector. For example, standardization and distribution have concealed the local character of beer and deprived

small breweries of their cultural importance as a production site of material artifacts and social identity. Therefore, entrepreneurial action became focused on demystifying beer as a commodity and creating awareness and understanding among brewpub customers for the craft of brewing with the aim of establishing the brewpub as a competence center for beer. In 2015, the owners started to organize brewing classes that were not offered by any other business in the city or region. Also, they began to challenge the famous German purity law, which, despite the common understanding, permits the use of various technical additives. One of the owners criticized the law by saying "today 'beer' is far removed from the original product because it is highly industrialized. This is what we are trying to communicate through the brewing courses, and we tell people: 'support your local brewery and brew your own beer because you can't get a better product.'" This culminated in the brewpub's advocacy for the 'natural law' (as opposed to the purity law), which allows only foodstuff (e.g., barley, wheat, oats, fruits, etc.) in beer production and prohibits artificial auxiliaries, emphasizing traditional procedures as inspiration for brewing. In collaboration with other regional breweries and a local café and craft beer store, the brewpub is contributing to establishing a homebrewing community that started to host regular meetings in the brewpub in 2019.

The transformation of the brewpub opened up possibilities to build capacity in its stakeholders and redefine the process of value creation (i.e., who creates value and for whom value is created). For example, the addition of brewing classes and beer tastings emancipated customers of the brewpub to become producers of their own beer at home. Some of these customers began building elaborate homebrewing equipment as well as sharing and exchanging insights, stories, and creations with staff members of the brewpub. Similarly, the initiative to list food suppliers in the restaurant menu encouraged the local chapter of the international initiative 'Marktschwärmer' (English: Food Assembly) in early 2018 to collaborate with the family-owners to host a weekly farmer's market in the brewpub with up to 17 local farmers participating. However, in 2019, while the Slow Food Organization recognized the brewpub for their holistic and regional focused approach to food and beer and listed it in their culinary guide, the initiators of the farmer's market closed the initiative because of decreasing interest in the fall of that year.

The transformation process of the brewpub, while initiated through conversation within the owner family, has built on and integrated diverse actors in situating the brewpub as a purpose-driven enterprise. While this reorientation facilitated the recruitment of highly qualified and passionate employees, it also relied on their active involvement to create new ways for using the menu to better

link the brewery and the restaurant. Moreover, the employees also took the lead in identifying areas of improvement and working through the process of increasing the sustainability performance of the brewpub. This focus on the collective ability of the staff has, among others, resulted in harmonious work relationships between front-of-house and back-of-house staff, which is further supported by the sharing of tips, collective multiple-day company outings, and fair wages. Similarly, some of the menu items relied on active co-creation of products with other stakeholders. For example, the brewpub's own ice cream resulted from an experiment with the owners of a local dairy farmer who were looking to diversify their revenue stream. The collaboration with other breweries in the region has evolved into regular beer festivals that are organized on the brewpub premises and combine awareness-raising for the local craft beer scene with musical entertainment and educational presentation that focus, among other areas, on sustainable food production and charitable causes.

5.4.1.3 Contextually realizing entrepreneurial action for sustainability strategy

The initial discussions over the brewpub's menu in 2009 have, through experimentations and monitoring, evolved into formalizing the mission in 2015. Initially, small changes, such as listing suppliers in the brewpub menu and observing the resulting effects (e.g., positive response from customers, an award of the Ministry for Agriculture, etc.), have created a pathway oriented toward increasing transparency of business activities. This emergent strategy informed new change processes such as when the owners reflected on the public debate around a controversial herbicide (Glyphosate) in 2015 and started to scrutinize the supply change of the malted barley used in the brewery. The conversations among the owners initiated a search process for an alternative supplier through which the owners identified an organic certified family-owned maltster in Germany. Similarly, the aspiration of demystifying brewing emerged out of the increased emphasis on transparency, which also resulted in exposing the bright tanks of the brewery located in the basement by drilling holes into the restaurant floor. While the fourth-generation owner emphasized the influence of the North American craft brewing movement for the brewpub development (e.g., by offering small bottle releases of associated styles, etc.), the third-generation owner used the space created through the 'natural law' to experiment with historical German styles (e.g., rye beer). Yet, realizing the mission is considered a work in progress. For example, the last frozen food item was substituted only in 2018, and sourcing of organic certified hops for the brewery started in 2020.

The evolutionary process that evolved the brewpub toward sustainability has been informed by and created strong alliances with other small businesses in the region. For example, a friend of one of the

owners started a coffee roaster from which the brewpub sourced their locally roasted direct-trade espresso beans. They also collaborated in brewing a limited edition of a coffee-inspired beer style. Similarly, the beer tastings that were initially hosted in the brewpub were later also organized on the premise of other befriended businesses. The entrepreneurs also strengthened their ties with renowned artists that organized concerts under the rubric of 'Rock gegen Rechts" (English: rock music against the right). These relationships have helped to establish the brewpub as a significant music venue in the city, which was acknowledged by a newspaper calling for protecting the brewpub under cultural heritage law due to its rich history. Another example is the beer festivals that was born out of conversations with a local foundation that hosts a 'makers market' in which the brewpub participates. These activities informed the collaborative approach of the brewpub as one of the owners illustrated "normally we would have said why support another business, they are competitors – that's the old business culture […] Today, we believe that there is no competition and small breweries have to support each other." This collaborative approach also helped the entrepreneurs in changing their hop supplier as a befriended brewery established contact with one of the very few organic farms in Germany.

The above described entrepreneurial action, although setting the brewery on a new pathway, are embedded in and shaped by the personal experiences and beliefs of the multigenerational family owners. For example, the initial focus to reorganize the brewpub's menu and the explicit focus on the on-site produced beer and schnapps initiated a search for other high-value products. While this change processes challenged the lifework of the third-generation, it aligned with their deep belief that "people should get offered sound products and their money's worth." Similarly, the experience of one of the owners who worked for a consultancy that once consulted a large slaughterhouse on increasing efficiency gains generated the interest to experiment with alternative suppliers and seek out organic certified products. The change in suppliers also created space to experiment with alternative producers of soft drinks that are regionally based or certified to ensure traceability. This decision was also building on a decade long discussion between the owners over whether the brewpub should offer beverages from transnational corporations on their menu. Similarly, the emphasis on entertainment and hosting renown artists for concerts in the brewpub aligns with one of the owners' musical interests who organized concerts for his own band in the brewery as early as 2006 as well as it continues the rich tradition of the family business that, for example, in the late 1950s accommodated a movie theater.

5.4.2 Case B: transforming the business into a community-building initiative

The Case B brewery is a typical example of a North American craft brewery that operates, in addition to the on-site beer production, a small taproom that functions as the primary contact point with its customers. The brewery opened in 2016 as a worker co-operative brewery. While being the third craft brewery in the city, it was the first in the province that was founded through a co-operative business model. Accordingly, the brewery is owned and managed by its workers; meaning that every worker-owner participates in decision-making, the company's activities are to be focused on the local context in which it is based, capital flows are to remain local, and workers are to be part of the local community. The orientation of the business model emerged and set in motion productive discussions among the six worker-owners that established the brewery purposefully as a mission-driven enterprise. Continued experimentation has enabled worker-owners to collectively evolve the brewery and develop its mission, which was formalized in the company's bylaws in 2013. The bylaws position the enterprise as a community-building initiative, striving to achieve the two goals of providing "good jobs" as well as an accessible space for the community that offers an "outstanding product." The following sections detail this process through understanding the role of intentional design, shared agency, and contextual realization of sustainability experimentation.

5.4.2.1 Intentionally designing entrepreneurial action for sustainability strategy

Initial discussions to start the brewery emerged among the entrepreneurs in 2013, which helped to prioritize the kind of action that was needed to shape the business purpose. The initial motivation of the entrepreneurs was to design a business model that would align with their values, including the company's community engagement, work environment, and product. Accordingly, the co-operative business model emerged as a means to ensure that profits would stay local, would be shared by those who create the company's value, and would protect the brewery against the entrepreneurs' observation that if "a small local business gets successful, an outside company buys it out and all the jobs become low wage service jobs, and the money is extracted out of the community." Through navigating provincial and federal legislation, the worker-owners developed the company's bylaws to formalize the brewery's orientation and directed entrepreneurial action to three areas: the work environment, community initiatives, and the brewery's product (see Table 5.4).

The focus of the brewery in combination with the worker-owners' realization that "half the reason a beer tastes good is the atmosphere in which it is shared and we want to bring music, food, friends, and beer together to create that" (Newspaper interview, 2014) informed strategic action. For example,

to navigate the complicated provincial legislation and to write the bylaws, the worker-owners sought help from other co-operatives. These experiences shaped the collaborative approach of the brewery toward other businesses. Also, the bylaws required the worker-owners to prepare for the case of dissolving the company. This motivated the worker-owners to identify suitable charity organization to which remaining funds would be donated in the case of the business closure. As a result, the entrepreneurs had already discussed different local charity organizations that aligned with their values and goals before opening the brewery. With the opening of the brewery, they started to collaborate with these organizations and supported them through fundraisers. To create a community space, the worker-owners organized open houses to publicize the opening of the brewery. This initiative was maintained after successfully opening the business through weekly concerts and restaurant popups at the brewery to offer a "local gathering place and watering hole." To develop the brewery into a neighborhood bar, the entrepreneurs ensured that "a diverse array of beers" were offered with "a variety of flavors to appeal to a variety of palates" as well as participation in external events reached the "wider community [beyond] the small taproom." Similarly, in working toward the mission to offer "good jobs," the entrepreneurs took action to onboard new workers as worker-owners and decided to only start differentiating people's salary after everyone would be paid a living wage which was accomplished in 2019 as they were able to raise the hourly wage by over 30 percent in 3 years. As the brewery quickly developed into a neighborhood bar, the worker-owners ensured the availability of "a diverse array of beers on the board, something light, something dark so that there's a variety of flavors to appeal to a variety of palates."

Entrepreneurial action across three domains of activity (see Table 5.4) aimed to establish a meaningful workplace and support community development. This is also stated on the company webpage: "Workers and community supporters own the business and have a say in how things unfold here… to make our community a more vibrant place to live by celebrating the intersection of creativity and craft beer." In working toward this vision, the worker-owners opened the brewery to like-minded organizations as a meeting place, organized literary events, and supported local artists to host weekly music jams on the production floor. Also, the brewery offered every new employee that started to work at the brewery the opportunity to become a co-owner by purchasing a membership after accumulating a certain number of working hours. The membership is set at the "price of a good used car" to guarantee that people can save up the necessary funds while requiring a conscious decision to do so. To ensure continuous experimentation with new product recipes and beer styles, a

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limited edition is being released in the taproom of the brewery every Friday. Often these one-offs are the result of collaborations with local breweries or other befriended businesses.

Table 5.4: Case B – Overview of the focus areas

Strategic focus areas	Strategic goals
Employment	Ensuring: Meaningful workplace Worker-ownership Fair wages Redefining the meaning of work
Community hub	Offering: Concerts and literary events Social gathering place Culinary experiences Fundraisers to support charity organizations
Craft beer	Offering: A variety of different product styles Frequent experimentation Collaboration with other breweries Changing the conversation about beer

5.4.2.2 Collectively enacting entrepreneurial action for sustainability strategy

From the perspective of the worker-owners, the brewery articulates a political stance: It redefines what it means to work as well as reshapes the role of a business in community affairs. The organizational structure, with employees owning the means of production, redefines social arrangements of workers and owners, and the brewery's orientation toward hand-crafted, small-batch production challenges the Canadian brewing industry. The brewery leverages both angles through its community focus as "the beer is what gets people in the door, the co-operative aspect is what sometimes hooks people, and because of that we are able to have conversations about what it means to own your workplace, what it means to have agency over your hours, over the place you spent so many hours per day." The focus on craft brewing also entails an education component to raise awareness of this alternative approach to manufacturing. The worker-owners explained that often new customers assume that the brewery would offer the same major beer brands found in any liquor store and may request those on their first visit. This creates the need for the worker-owners to engage customers in conversations about the role of beer and brewing in society, explain what goes into to craft beer, and why it is different in comparison to industrialized products that, from the perspective of the worker-owners, lacks local significance.

The orientation of the brewery, along with its co-operative bylaws, created opportunities to ensure community-oriented value creation processes and built capacity for change in other businesses. To establish the brewery as a community-building initiative, the then six worker-owners, besides their

own investment through membership shares, sought support from 16 community investors, a local credit union, and raised additional funds through a locally-focused crowdfunding campaign. The brewery's outreach through events as well as by running the front- and back-of-house required the team to grow faster than anticipated and expanded the group of worker-owners to eight, created three fulltime jobs, and allowed the other worker-owners to flexibly allocate their hours as they saw fit. Also, the brewery actively supports other businesses to follow in their footsteps by supporting them in designing their own co-operative bylaws and navigating the "unnecessarily prohibitive, restrictive, and outdated legislation of the province." Also, they support other breweries in the region through sharing information that otherwise would be considered proprietary, occasionally providing training in the brewery, as well as helping out if a brewery comes short on ingredients.

The contiguous operation of the co-operative brewery is made possible through an extended network on which the worker-owners rely on for supporting entrepreneurial action. For example, the crowdfunding campaign raised over CAD $16,000 in funds from over 200 backers for a "people's fermenter," which was set aside for experimental brews that are served every Friday to allow the community to taste something different in addition to the seven rotating taps. Similarly, to propel their mission as makers of hand-craft, small-batch beer, the brewery initiated and organized every year a harvest festival in collaboration with other local craft breweries. This collaboration is a response to the City's official Oktoberfest that has given the exclusive rights to sell beer to a transnational corporation, freezing out the local craft brewing scene. The festival also supports and brings to the fore the comradery among craft breweries as many of them partner for this event to collaboratively produce a limited-edition product. While the initial plan of the worker-owners to open a brewpub did not come through, they now host a local food vendor once a week to "bring something interesting to the area." In this way, the brewery has become a place for social gatherings, offering a music venue to musicians, through weekend concerts and rehearsal space, as well as supporting like-minded local food businesses and providing the neighborhood access to unique culinary experiences.

5.4.2.3 Contextually realizing entrepreneurial action for sustainability strategy

The orientation of the brewery and the realization of its bylaws have gradually evolved through entrepreneurial action in the three business domains (see Table 5.4). Initially, the vision for the co-operative business evolved from the worker-owners passion for "craft beer and local food movements" with the goal to establish "a quirky craft brewpub in the heart of [city name] (crowdfunding campaign, 2014). Yet, because of various challenges, this vision was not realized. The

lack of affordable real-estate options "pushed [them] out of downtown," requiring "to downscale [the initial vision] and open up a microbrewery with a tasting room, and a space for community events" (newspaper interview, 2015) and to redevelop the business plan. Similarly, the provincial legislation caps fundraising for co-operatives at CAD $200,000, which posed another substantial challenge to the entrepreneurs. This required the worker-owners to look for used brewing gear to make the most out of their limited funds which, after purchasing and repurposing equipment, required additional piping and welding as well as refining of the brewing process to accommodate the "single most iconoclastic brewing system in [the province]" (industry guide). This experimental approach also informed and is informed by the process to develop the brewery into a community hub by hosting open house events before they opened, inviting community members to test different recipes, and informing participants about their unique business model.

The worker-owners have mobilized capacity internally and built strategic alliances with various organizations creating a support network for realizing their vision. The worker-owners combined a diverse array of expertise in welding, brewing, event organization, electrical work, and design, which allowed them to build the company based on internal talent as well as to seek the help of other organizations when expertise was missing. For example, before opening the brewery, one of the worker-owner bartended at a local craft beer bar to gain front-of-house experience. Similarly, for the financial modeling, the co-operative collaborated with a nearby brewery that shared their numbers and sales figures to help forecast sales volume. The worker-owners have also actively furthered this collaborative mindset among the craft brewing scene in the region by sharing equipment and ingredients with other breweries or organizing shared events. Similarly, because the initially panned brewpub could not be realized, the brewery is now hosting local food businesses every week as well as collaborating with local businesses and charity organizations for events. To advance their political vision, the worker-owners assess each collaboration to ensure they will be "working with like-minded and value-aligned organizations, so we try to focus on social justice causes very locally based because we're a co-op."

The entrepreneurial action that carved out a new space for the co-operative brewery to flourish is shaped by the individual experiences of the worker-owners. For example, the focus on craft brewing evolved from the search for a satisfying brewpub experience and the realization that "our city has a unique and vibrant history. We're growing and we're diversifying. Our beer should reflect that" which settled the worker-owners on the path to focus on diverse craft brewing products. While this

drew in similarly minded people when the group was forming at a local university, later, the worker-owners translated this ambition into the experimental beers that the brewery serves every week. Similarly, the focus on the co-operative model emerged from the university research of one of the worker-owners that examined the effects of transnational corporations on local communities.

5.5 Discussion

This research details how entrepreneurial actions for sustainability strategy emerge and evolve in two small businesses in the brewing industry. The case narratives are presented along three analytical dimensions constructed from strategic entrepreneurship, overlaid with a normative intent toward greater sustainability: actions that are **intentionally designed** with attention to creating environmental, social, and economic value; actions that are **collectively enacted** so that value is co-created and shared; and actions that are **contextually realized**, which integrates the purpose of the organization with the meaning structures of the host context.

The next step in interpretive research is to move to second-order concepts, or "the concepts of the concepts of social actors" (Gephart, 2004, p. 457). In the sections that follow, we examine how disparate entrepreneurial actions, that emerge from significantly different pathways, form and evolve sustainability strategies in the analyzed businesses. This observation is supported by research on sustainable entrepreneurship that has identified different starting points, or action contexts, for entrepreneurial action (Boons & Lüdeke-Freund, 2013; Luederitz, Westman, Mercado, Kundurpi, & Burch, 2020). Accordingly, entrepreneurial action that transforms operational procedures may emerge from technical changes (e.g., manufacturing) and organizational dimensions (e.g., changes to the business purpose) (Boons & Lüdeke-Freund, 2013). From this perspective, Case A, with the initial focus on modifying the resource throughput of the brewpub, and Case B with action first targeting the business purpose of the brewery, present two opposing ends of a spectrum of entrepreneurial action. (Luederitz et al., 2020).

Despite the difference between the cases, they collectively shed light on how disparate entrepreneurial actions support navigating the challenges involved in strategy formation and evolution. The two cases offer insights into how a process approach to sustainability strategy can support moving beyond the "dualistic divide between opportunistic business and altruistic charity" (Muñoz & Cohen, 2018, p. 311).

5.5.1 Sustainable entrepreneurship as a process approach to sustainability strategy

The following sections demonstrate how a process approach to strategy development can mobilize and be mobilized through disparate entrepreneurial actions. More specifically, we distill three elements that constitute an emergent process approach through which entrepreneurial action makes possible sustainability strategy formation and evolution. This synthesis posits that strategy formation and evolution 1) is mobilized through deliberative and reflexive action, 2) requires bridging of diverging orientations, and 3) is realized through dialogue and conversations.

5.5.1.1 Entrepreneurial deliberation and reflexivity as a process element of sustainability strategy

The formation and evolution of sustainability strategies require entrepreneurial action to be deliberate and reflexive. Contrary to the common assumption in research on sustainability strategy that strategies need to be first planned and then implemented (Neugebauer et al., 2016), the results provide evidence on the emergent nature of this process. For both of the examined cases, this holds true independent of where in the business initial change was realized to support the emergence of a new strategy. As shown by the results, entrepreneurial action in Case A focused initially on transforming the value proposition by streamlining the product assortment. In contrast, in Case B, the starting point emerged from changes to value capture by founding the venture as a co-operative business.

In both cases, the identification of the respective starting point required reflexivity from the entrepreneurs "to not only see beyond the taken-for-granted assumptions … but also to identify and act upon opportunities to change" (Suddaby, Viale, & Gendron, 2016, p. 228). Moreover, this necessitated entrepreneurs to be deliberative, "to act in the light of the consequence envisioned at the right time," which requires experience and careful judgment of the action context (Rowley & Gibbs, 2008, p. 365). Changes to the value proposition by reducing menu options in Case A questioned the previously held assumptions "that you have to offer people something [otherwise they won't come, which had] always resulted in the blind expansion of offered goods and services." Similarly, the deliberate decision to source ingredients locally and from organically certified suppliers emerged from the personal experience of the family owners and the envisaged consequences that conventional agricultural production has on the environment. In Case B, the entrepreneurs also entered uncharted territory when founding the brewery as a co-operative. The initial motivation for the business emerged from the worker-owners experience, and their longing for a community space as the owners suggested: "[We] have been waiting far too long for a quirky craft brewpub … [with] a relaxed,

unique environment. Well, we got tired of waiting for some ambitious entrepreneur to do the job so we decided to do it ourselves" (crowdfunding website). Furthermore, the strategic orientation of the brewery as a community-building initiative resulted from the deliberate action to host 'open house' events before the business started to operate. While such small or insignificant actions were primarily focused on anticipating preferences and engaging prospective customers, they also supported the formation of strategy through reflexivity.

5.5.1.2 Entrepreneurial action as a bridging device for sustainability strategy

Formation and evolution of sustainability strategy "is an exercise in managing essentially unresolvable tensions and paradoxes" (Etzion, 2020). The two cases offer insights into how entrepreneurial action can support this process by mediating tensions between potentially opposing interests through "selectively coupling" (Pache & Santos, 2013, p. 973). In both cases, this was done by mobilizing the companies' products to accommodate divergent interests. As shown by the description of Case A, the family owners situating beer as an intermediary to bridge the company's focus on establishing an alternative approach to food and offering a unique cultural experience (see Section 5.4.1.1). This helped to connect areas of activity that the narrow perspective of the ABC-analysis that initiated the change process would have rendered omissible as they were beyond the core focus on the brewpub. Framing the company's on-premise produced beer as an asset, the family owners were able to reinterpret the value proposition of the brewpub while harmonizing historically gown attributes with the newly emerging sustainability-oriented strategy. Moreover, it created space to engage in new activities (brewing seminars, beer tastings, sommelier certification, homebrew meetings, etc.) that from the initially performed rationalization would have been seen as unnecessary.

These observations are similar to Case B, where the worker-owners mobilized the company's product to bridge the community-orientation and political aspirations of the business (see Section 5.4.2.2). While the artisanal approach to brewing required accompanying explanation for selling and marketing the company's product, the worker-owners also built on these conversations to explain the business social mission as a co-operative business and its political implications. Accordingly, entrepreneurial action can leverage a business product to inform strategy formation (as in Case A) or situate a product to connect the diverging interests of a business in the same action context (Case B). In both cases, the product is imbued with meaning beyond its value proposition and functions as value generation as it is strategically mobilized in support of specific aspirations. Moreover, entrepreneurial

action leveraged the business product as a 'bridging device' between (diverging) strategic goals, which helped to develop mediating relationships between them.

5.5.1.3 Entrepreneurial dialogue as a process element of sustainability strategy

Entrepreneurial action in support of sustainability strategy needs to mobilize a multi-stakeholder dialogic approach to change. The importance of dialogue for learning is well-substantiated in the literature that mostly focuses on large firms and the role of managers in directing this process (Engert & Baumgartner, 2016; Galpin et al., 2015; Mazutis & Slawinski, 2008). In smaller organizations especially, the conversations with a diverse set of outside stakeholders are as important as those within, to situate the purpose in-context and co-create value. The results demonstrate that sustainability strategy formation and evolution in small businesses go beyond the technical or managerial aspect of implementation and require the communitive aspect of entrepreneurial action in creating intersubjective meaning between multi-stakeholders of the business venture (Burström von Malmborg, 2002; Hahn et al., 2018). Both of the presented cases detail the critical role that a dialogic approach plays for strategy formation and evolution.

In both cases, the initiative for strategically orienting the business while navigating the restructuring (Case A) and founding process (Case B) was initiated through extensive dialogue among the respective owners. Yet, the presented analysis sheds light on this kind of dialogue which is not primarily focused on strategy development or the topical focus of a change initiative (Hahn et al., 2018), but rather "involves attention to the other person with a goal to enhancing understanding of both the self and the 'other' with whom one is conversing" (Nicholson & Kurucz, 2019, p. 38). In Case A, the dialogic approach was essential to evolving the intergenerational relationships among the family owners. In Case B, it facilitated the formation of a new group of people and laid the groundwork for politicizing action. In both cases, the dialogic approach enabled the owners of the respective businesses to broaden the focus of change and engage a diverse set of stakeholders in the strategy evolution process. In both cases, it facilitated the formation of a business network of local food producers, enabled co-creation of products, and made possible the co-hosting of a festival aimed at strengthening this emerging network. Thus, entrepreneurial dialogue gives means to a learning process beyond facilitating strategy implementation as it supports the creation of meaning for and from strategy formation and evolution. While entrepreneurial dialogue may predate the initiation of the business transformation, it also facilitates strategy evolution. As demonstrated by the results, a multi-stakeholder dialogic approach helped to articulate the formation of new ideas that emerged

from the embedded entrepreneurial experience and made them comprehensible in language (Ansell, 2011; Cornelissen & Clarke, 2010; Weick et al., 2005). This actively facilitates deliberation over selecting and prioritizing meaningful action.

5.5.2 Contributions to linking sustainable entrepreneurship and sustainability strategy

This research advances the scholarship on sustainable entrepreneurship and sustainability strategy and their interconnections in two important ways. First, the process approach that this research advances to understand sustainability change in small businesses contributes to the paradox perspective of sustainability by providing empirical evidence on how tensions that emerge from strategy implementation can be addressed through entrepreneurial action. Second, based on the outlined process approach, we argue that sustainability strategy formation and evolution depend on an entrepreneurial, inquiry-driven approach to facilitate deliberate and reflexive learning processes.

   This work contributes to the paradox perspective on sustainability (Hahn et al., 2018; W. Smith & Lewis, 2011) by detailing empirically how entrepreneurs in small businesses mobilize organizational and contextual resources to address emerging tensions between strategy dimensions productively. Contribution to this view primarily focused on individuals (Belz & Binder, 2017; de Clercq & Voronov, 2011; Joseph, Borland, Orlitzky, & Lindgreen, 2018) or organizational architecture (Hahn et al., 2014; W. Smith & Lewis, 2011; Van der Byl & Slawinski, 2015) for understanding how conflicts can be addressed (Hahn et al., 2018). While empirical examinations of this phenomenon have started to link these approaches by detailing how organizations accumulate support for sustainability through action cycles, such studies are mostly focused on large organizations (Hengst et al., 2020). Moreover, they often assume a given sustainability strategy to 'provide' actors with values that can be (flexibly) prioritized as they see fit. This study supports this research by detailing the importance of a procedural conceptualization of sustainability strategy formation and evolution in small businesses. Yet in the analyzed cases, the normative values were not first conceived or ex-ante derived from strategy implementation, which would have been at odds with existing activities. Instead, the findings offer insights into how normative values emerge from enacting intentions within the organizational and contextual context. Accordingly, this research emphasizes the recursive nature of the paradox view on sustainability, because paradoxes are created and addressed through action that, over time, accumulate into a sustainability strategy. As illustrated in both cases, these recursive tensions generated productive capacity within the business to create new business values and long-

term strategic orientation that would not have been created through economic rationalization or sustainability principles.

The findings contribute to research that conceptualizes sustainable entrepreneurship as a purpose searching and purpose generating endeavor (Cohen & Muñoz, 2015; W. Stubbs, 2019) and brings it into dialogue with sustainability strategy (Hahn et al., 2014; Hollensbe, Wookey, Hickey, George, & Nichols, 2014). We argue that purposeful organizing emerges from deliberate, reflexive, and dialogic action that establishes relational linkages between the social purpose and the business activities of an enterprise. While other scholars have observed a missing link between "the interpretation of a sustainability issue and the strategic response taken at the organizational level" this research suggests entrepreneurial action as the transitional force (Hahn et al., 2014, p. 257; Muñoz, Cacciotti, et al., 2018). First, this complements research that has detailed how business certification schemes, such as Benefit Corporations, shape entrepreneurial action that translates between a business purpose and its strategic organization (Muñoz, Cacciotti, et al., 2018; W. Stubbs, 2019) by providing in-depth descriptions of purposeful organizing outside of such accreditation. Second, while some investigations have been undertaken into the influences of sequential action and the importance of time for developing purposeful strategies (Muñoz, Cacciotti, et al., 2018; Papagiannakis et al., 2014; Slawinski & Bansal, 2015), this research contributes to these studies by examining the temporal aspect in strategy formation and evolution beyond chronicling actions. This offers insights into the nature of entrepreneurial action and how intention, shared agency, and context support the creation of sustainability opportunities. These actions collectively created situations that enable entrepreneurs to reflect upon the orientation of the business purpose and work processes as well as engage in deliberation over the direction and appropriateness of change (Slawinski & Bansal, 2015). This study posits that the resulting business culture propels the entrepreneurial journey in the analyzed cases and supports the impact of the respective business as small change in one area eventually gives way for redefining the business purpose or supports its manifestation in operational procedures over time.

5.6 Conclusion

This research has offered a detailed examination of how entrepreneurial action supports the formation and evolution of sustainability strategies. While in previous research process-oriented investigations into sustainable entrepreneurship have been largely absent, the focus has remained on 'what' and 'why' questions that foregrounded underlying manifestations and motivations of this phenomenon. This research has responded to this gap by providing an in-depth analysis of 'how' sustainable

ventures form and evolve to understand the role of entrepreneurial action in organizational change. This study offers a dynamic process model for systematically investigating intentions, collective agency, and contextual realization of sustainability strategies. By applying this framework to two small businesses in the brewing sector in Canada and Germany, this research developed a process approach to sustainability formation and evolution. This approach highlights the importance of entrepreneurial action to be reflective and deliberate, engaging diverging interest through the business product, and mobilize a dialogic multi-stakeholder approach for developing the strategic orientation of the enterprise.

By integrating sustainable entrepreneurship and sustainability strategy, this study makes a key contribution to the paradox view of sustainability and research on purpose-driven ventures. First, it details how a procedural understanding of unresolvable tensions can help explain how entrepreneurs create and address them. As demonstrated by the results, potentially conflicting values emerge from the realization of multidimensional intentions in pursuit of economic, social, and ecological aspirations. A procedural understanding suggests that these tensions are recursive and generative as they reinforce conflict when being addressed and enable sustainability efforts to span multiple dimensions and become more complex with entrepreneurs, bringing them in dialogue by mobilizing their product as bridging device. Second, by mobilizing a procedural approach to strategy, this research shows how entrepreneurial action links the interpretation of sustainability issues with the strategic orientation of the business. Yet, this is not a linear relationship, but operational activities and the social purpose of business are recursively linked, meaning that entrepreneurs engage with sustainability through action. Understanding the recursive link, or the lack thereof, between sustainability issues and action, may help to better conceptualize how businesses are able to mobilize small changes in one area for strategically orienting the enterprise toward sustainability.

The developed process approach through which entrepreneurial action support sustainability strategy formation and evolution offers room for dynamic conceptualizations of how small businesses become more sustainable. It also suggests advancing sustainability in small businesses needs to go beyond abstract guidelines and principles to dynamically address intentions, collective action, and contextual requirements in the process of business transformation. It is our hope that this study can help contribute to such efforts.

Chapter 6

Conclusion

6.1 Thesis summary

In this research, I demonstrated how small businesses mobilize knowledge in support of action for sustainability transformations through learning processes that empower individuals and collectives. The question that guided my research focused on: how small businesses generate and mobilize knowledge through inter- and intra-organizational learning in ways that support their ability to take action and contribute to transformations of the food sector toward sustainability. To address this question, I detailed in the preceding chapters how craft breweries – businesses that are small in size, independently operated, and inspired by non-industrial production methods – engage in and bring about transformational change for sustainability. Moreover, I have emphasized throughout this thesis that the craft brewing movement is unique because it is characterized by a collaborative ethos, the apparent friendships between businesses, and a community focus.

In this chapter, I summarize the insights gained and synthesize lessons learned about the role of knowledge and action in learning processes that support small businesses to realize change for sustainability in seemingly unfavorable circumstances. Subsequently, I consider the implications of this research for business action and conceptualizations thereof, reflect on the nature of this interpretive endeavor, and offer insights for future research.

The purpose of this research was to explore different dimensions of learning processes through which small businesses mobilize knowledge to purposefully organize and enact action for sustainability. The craft breweries within the two analyzed case studies in Canada and Germany offered insights into these processes as they collectively shape a movement with its own narratives that articulate new meanings for action. The breweries facilitate and engage in inter- and intra-organizational learning through knowledge conversion processes that iteratively and dynamically translate between tacit and explicit forms of knowledge; these processes, in turn, construct a new operating space with its own logics and social arrangements. Moreover, these learning processes emerge from entrepreneurial action through which businesses create and recreate salient experiences from purposefully organizing business operations toward sustainability. By drawing on engaged scholarship methodologies, I sought to study these learning processes carefully to create a deeper

understanding of the experiential foundations of knowledge generation and mobilization in the service of sustainability actions as social phenomena.

This research builds on a dynamic conceptualization of knowledge and action, shedding light on how they relate to one another and are supported by learning processes. For developing this nuanced understanding, I brought different conceptualizations of learning into dialogue with a pragmatist understanding of knowledge and action. In chapters 1 and 2, I framed learning as a deliberate, reflexive, and experimental approach to address concrete problems to generate knowledge in support of action. This allowed me to conceive of learning, knowledge, and action as intertwined in "an on-going process of problem-solving, deliberation, experimentation, sedimented over time as experience, identity, habit, skill and knowledge" (Ansell & Geyer, 2017, p. 151). In Chapter 1, I supported this framing through three perspectives, namely: organizational learning, interactive learning, and social learning, which together informed the empirical research of this thesis. I then furthered this conceptualization in chapter 2 by drawing on philosophical pragmatism. Knowledge, from this perspective, is inseparably linked to the learning process through which individuals and collectives confront and construct the contextual realities in which action is embedded, and which further shape the normative orientation, experience, sense-making, and agency of actors. This laid the groundwork for empirical examinations of learning, knowledge, and action in Chapters 3, 4, and 5.

Learning processes are informed by new organizing principles that guide the sensemaking of craft breweries as they engage with new action in a new context (see Chapter 3). By studying closely how craft breweries in Canada and Germany contextualize the two organizing principles of artisanship and cooperation, I showed that learning to act differently is informed by so-called metanarratives – grand narratives that provide an interpretative framework for actors to make sense of novelty based on key value judgments (i.e., organizing principles). Craft breweries draw on these alternative organizing principles to creatively give meaning to new activities and mobilize emerging meaning categories for constructing narratives of change that externalize new belief systems and, thus, new organizing principles. These narratives of change emerge from the actors' ability to compose and recompose themselves as they derive guidance from new metanarratives to navigate the learning process required for engaging in newly established ways of doing. For example, in the contexts that I examined, breweries draw on the organizing principle 'the art of making' for creatively developing a new language to articulate heterogeneous processes (e.g., traditional brewing) and local features (e.g., terroir); this new language is further mobilized for reinterpreting organizing principles of

industrialization (e.g., consistency and standardization) within the new, and varied contexts that craft breweries navigate. Accordingly, it is the sensemaking ability of the actors and their emerging group affiliation that allows them to cast in a new light the action that is new in the respective context (e.g., using local ingredients) while drawing on reminiscent situations in the past and other contexts (e.g., new organizing principles). This work offers new avenues for research to examine more closely the role of organizing principles in emancipating otherwise marginalized actors and their action as well as how they could purposefully draw on organizing principles to express new value systems for accelerating change for sustainability.

Learning processes among craft breweries mobilize knowledge for constructing sustainability niches in an otherwise hostile environment (see Chapter 4). In this study, I developed a dynamic conceptualization of knowledge as conversion flows between tacit – embodied – and explicit – codified – knowledge to understand how they support actors to engage niche construction processes that are responsive, interpretive, and emergent. The results show how the conversion between tacit and explicit knowledge support craft breweries to creatively (re)act on environmental stimuli while simultaneously transforming this context and, with it, construct conditions that are more favorable to non-industrialized food production. Knowledge conversion between craft breweries also supports their ability to collaboratively formulate goals that shape the normative direction of change and guide niche construction. While knowledge is considered an inherently intangible asset, I also demonstrate with this research how knowledge conversion among organizations makes tangible assets accessible and supports realizing new possibilities. For example, as people in the craft brewing movement are often socialized in informal amateur groups (i.e., knowledge conversion within tacit forms of knowledge), they mobilize the so created identity for experimenting with new equipment beyond what is considered conventional practice. Moreover, they rely on the cooperative network among craft breweries that is maintained through openly sharing insights and intellectual property (i.e., knowledge conversion within explicit forms of knowledge) and access tangible assets such as equipment, ingredients, and shared marketing. This work casts small business in a new light by empirically demonstrating the creative ability of this actor to instigate and advance niche construction in a grassroots fashion that fosters collective learning processes in sustainability transformations.

Learning processes for sustainability within craft breweries emerge from entrepreneurial actions that support forming and evolving the strategic orientation of small businesses (see Chapter 5). For this research, I brought into dialogue research on sustainable entrepreneurship and corporate

sustainability strategy. By studying two craft breweries over time, I analyze how sustainability strategies emerge over time from entrepreneurial actions that are intentionally designed and collectively enacted within the specific host context. By inductively developing the procedural concepts that shape and underpin entrepreneurial action, I synthesized a process approach for understanding how sustainability strategy in small businesses emerges. Based on this interpretive approach, I draw attention to the way in which deliberate and reflective entrepreneurial action successfully couples diverging interests and advances multi-stakeholder dialogue for evolving the strategic orientation of an enterprise. This research demonstrates that the entrepreneurial actions through which businesses contextually realize sustainability create unresolvable tensions because they are guided by, and generate diverging interests. Yet, these tensions are recursive and generative as they reinforce conflict in the context in which they are being addressed as well as they enable sustainability efforts to address multiple dimensions simultaneously. Moreover, I showed how entrepreneurial action links the interpretations of sustainability issues with the strategic orientation of a business; recursively connecting business operations with the social purpose of an organization. This work suggests that advancing sustainability in small businesses requires entrepreneurs to intentionally design organizational change, develop shared agency through meaningful interventions, and leverage context-specific resources for acting appropriately in complex situations.

6.2 Research contribution

My research provides a deeper and more defined understanding of how small businesses contribute to sustainability through learning processes that creatively mobilize knowledge for action. In this thesis, I offer a dynamic understanding of how knowledge, learning, and action support small businesses to take action for sustainability transformation. Below, I outline how this research advances conceptualizations of small businesses in four areas and the key implications it holds for organizational research, sustainability research, the geography of knowledge, and the action context in which small businesses operate.

   This thesis contributes to *organizational research* that focuses on the ability of small businesses to advance sustainability. Especially, it illuminates that small businesses are a unique form of organization, and also that small food manufacturing firms are critical for system transformation. A prominent conceptualization of small businesses in the literature argues that the agency of this actor is limited by a lack of resources, which significantly impedes the process through which small businesses become more sustainable (Grimstad & Burgess, 2014; Lee, Herold, & Yu, 2016). More

generally speaking, the lack of resources limits their transformational potential and restrains efforts to gradual improvements (Love & Roper, 2015; Woschke, Haase, & Kratzer, 2017). On the other hand, counter perspectives have reinterpreted this focus on the limitations imposed by resource constraints. These scholars argue that, first, this characterization of small businesses is narrowly focused on a comparison to large firms, and, second, they demonstrate that the unique positionality of small businesses allows them to address sustainability in unique ways such as by pursuing community-embedded approaches, fostering long-term relationships, and prioritizing collective well-being (Jämsä, Tähtinen, Ryan, & Pallari, 2011; Roxas & Chadee, 2012; Westman et al., 2019). The three empirical chapters of this thesis add to the latter perspective. Together they show how craft breweries can succeed in making progress on sustainability throughout disrupting events (i.e., the lack of resources) in a way that creates possibilities for entrepreneurs to engage in renegotiation and reflection upon their context. The analyzed businesses not only actively shaped the environment that influenced their (inter)action, they also viewed themselves as agents and collaborators in pursuit of broader social goals. Chapter 3 highlights how the generated change processes are "brought to consciousness and made a factor in determining present observation and choice of ways of acting" (Dewey, 1916, p. 106). Chapter 4 empirically scrutinizes the underlying knowledge conversion through which peer-to-peer learning may develop into and support a movement that serves as an inspiration to small businesses for how to devise a course of action to realize the aspired alternative future (Chapter 5). Collectively, this research demonstrates empirically how small businesses creatively experiment in these situations to generate new orientations that empower them once again to strategically pursue their purposefully (re)organized goals (see also Runyan & Covin, 2019).

This thesis contributes to *sustainability research* that focuses on broader transformation processes. Existing research has primarily focused on tangible assets such as environmentally efficient technology, natural resource flows, or policy interventions to understand the role of transformational change in impeding or accelerating sustainability. More recently, a small but growing number of scholars have acknowledged that fundamental transformations for sustainability require changes to existing knowledge systems and the way in which people generate and mobilize knowledge (Fazey et al., under review; Loorbach et al., 2020; Tàbara, 2013). Yet, a key research gap remains regarding our understanding of the processes through which actors can evolve knowledge systems in ways that incorporate sustainability properties encouraging collaboration, holistic approaches, and wisdom (Fazey et al., under review). I contribute to this strand of research by detailing the role of knowledge, learning, and action for fundamental transformations toward sustainability. The empirical research

presented in Chapters 3, 4, and 5 provides a layered account of how tacit and explicit knowledge, and the dynamic conversion thereof, are at work in learning processes that support actors to take ambitious action for sustainability. While this research detailed some of the sustainability aspects advanced by the craft brewing movement, it moved beyond these substantive issues to uncover the procedural aspects of sustainability change. Thus, this work contributes to the conceptualization of action-oriented knowledge for sustainability and how it supports learning processes involved in fundamental transformations.

This thesis also contributes to scholarship on the *geography of knowledge,* which has examined how knowledge flows among proximate and spatially dispersed actors (Amin & Cohendet, 2005; Quartey, 2019). Related research has firmly established the role of tacit knowledge in driving innovation processes in geographical clusters (Gertler, 2003). Research on knowledge flows has examined related processes on either the macro- or the micro-level (Malmberg & Maskell, 2010). While the former perspective has examined how knowledge travels between regions (e.g., by studying patent citations, worker mobility, etc.) (Breschi & Lissoni, 2009; Henderson, Jaffe, Trajtenberg, Thompson, & Fox-Kean, 2005), the latter has studied the location of firms and how notions of proximity mediate innovation and agglomeration processes (Boschma, 2005; Coenen, Raven, & Verbong, 2010; Morgan, 2004). My contributions to this scholarship offer a detailed empirical analysis of the role of localized knowledge in learning processes and the transmission channels through which business networks can mobilize knowledge flows to facilitate cooperation across competitive market actors (Breschi, 2010). The three empirical chapters contribute to the perspective focused on the micro-level, illuminating how specific actions within business networks support knowledge flows among firms that may generate what others have described as the "local buzz" of local milieus and knowledge spillover (Bathelt, Malmberg, & Maskell, 2004, p. 38; Storper & Venables, 2004). More specifically, Chapter 4 demonstrates how actions that support knowledge conversion among firms require spatial proximity of actors to enable interactive learning (see also Section 1.1.1.2). While others have established that actors greatly benefit from the local buzz by 'simply' "being there" (Gertler, 1995, p. 1, 2003), Chapters 3 and 4 detail the micro-level processes that underpin this phenomenon and demonstrate how firms intentionally generate and take advantage of local knowledge spillovers. Moreover, Chapter 4 illustrates how firms engage in shared meaning-making in the process of developing relational identities, which enables their situated understanding of each other. Finally, collectively the three chapters offer insights into how informal knowledge generation and sharing may complement and even substitute learning processes that are traditionally

associated with regional associations and professional organizations (Vinodrai, 2015). While in other context intermediaries have been shown to assume a critical role in accelerating change for sustainability (Kundurpi, Westman, Luederitz, Burch, & Mercado, under review), the disregard for regional association among the analyzed businesses may have stimulated their creative ability to create informal exchanges, foster communicative action, and engage in networking to compensate for the lacking support.

Based on this research, I offer two important insights to support the ability of small businesses to make progress on sustainability. First, I reiterate a key observation that many of the interviewees articulated: "we also recognize that we need each other because if it is only one of us against the big guys we are nothing. The only strength we have is in numbers and being able to collaborate." For a sustainability-oriented small business, the implication is that successfully operating a viable enterprise hinges on the concerted efforts of other small businesses. This means that cooperation among small businesses in a given sector, as well as cross-sectoral collaboration, is essential for an enterprise to take meaningful action for sustainability. At the same time, I emphasize that the shape and form of such cooperative arrangements need to be fundamentally concerned with the key business activities; suggesting cooperation to be as much a process as an outcome. While Chapters 3 and 5 reiterate this observation in the context of mobilizing supporting narratives and strategy development, Chapter 4 offers a detailed description of activities to serve as an inspiration for small businesses to leverage this insight.

Second, I offer a holistic approach for small businesses to support change for sustainability. Importantly, I do not suggest an additional set of activities for realizing this ambition. Instead, by moving backward through Chapters 5, 4, and 3, I outline an approach centered around entrepreneurial action. Chapter 5 offers two perspectives for this approach by detailing how small businesses can become purposefully organized enterprises by conducting small changes to their operational procedure and gradually working toward refining their social purpose. Alternatively, Chapter 5 also presents a case where this change process originates from defining the organizational intent first. Chapter 4 complements this intra-organizational perspective by offering key insights into actions that can support inter-organizational change through building alternative social arrangements. The insights that Chapter 3 offers into the relationship between actions and narratives can be mobilized to develop new meaning categories for narratives that enhance sustainability-oriented business activities. Taken together, I intend with my research to serve small businesses by bringing to the fore their creative

ability to coordinate and collectively realize change for sustainability and highlight the sway these organizations hold over the transformation of the food sector.

Admittedly, these suggestions are speculative as I derived them from a small number of unique businesses that operate in the brewing industry. Thus, they do not offer a blueprint for firms in general. Instead, this research offers points of reflection for small businesses that embank on realizing sustainability-oriented change. The following section elaborates on these limitations in detail.

6.3 Research limitations

In this section, I reflect on research limitations that are both general, as they pertain to the research design, and specific, as they concern the research process. First, as outlined in Chapter 2, I followed an interpretive research frame to explore the meanings that people ascribe to their actions. Thus, I do not intend for my findings to be generalized across and beyond the studied cases. Moreover, the craft breweries that I interviewed were small and often young organizations that employ only a few people who are driven by a deep passion for their profession. While general insights may be relevant for other contexts (e.g., that small businesses are resourceful, have an innate ability to change and interact with their environment, construct their own meanings from action which in turn enables them to pursue normative action, etc.), to be meaningful, they will have to be adapted to the intentions of people, the social arrangements that are at work, and the contextual characteristics that shape social (inter)action.

The purpose of this research was to offer an in-depth perspective on the examined phenomenon by focusing on the experiential foundation of knowledge, action, and learning. The conducted research has specific limitations. These limitations include my positionality in the research process, from designing the methodology to collecting and analyzing material. First, the research design focused on two case studies in which I was intimately involved before this research, which significantly influenced how I navigated the research contexts and what circumstances I deemed interesting. Future research could address this limitation by focusing on situations in which the researcher is not intimately involved through their biography. This, however, may create other challenges for the researcher, for example, if one aims to develop an empathetic understanding of the case. Second, due to the geographical distance, I did not engage with the two cases in a similar manner (e.g., trust-building and field visits). While extended visits would have helped to address this shortcoming, they were beyond the means available to me. In anticipation of this limitation, I deliberatively chose two

cases that I was familiar with before I embarked on this research. Third, the emphasis on localized learning processes may have foregrounded how individuals interact in generating and sharing knowledge while discounting the geographical difference between the two analyzed case studies. Future research could address this shortcoming by analyzing more closely the histories of the two case studies and unravel how different outcomes are rooted in regional and national differences. Fourth, I would have appreciated more and frequently recurring interviews with participants to further refine my understanding of the research context; yet, the circumstances of the businesses that I engaged with rendered this impractical. The businesses I interviewed were small manufacturers where long working days are the norm, and labor is scarce. This also meant that during meetings, interviewees sometimes had to check-in on or initiated a new process on the brewery floor. Although the interviewees often expressed gratitude toward the reflective nature of the interview process, the 'smallness' of these enterprises also suggests that this research and the time needed for the interview put a significant strain on the involved businesses. The valuable time that the interviewees contributed to this research meant longer working days for them. This was also articulated by some of the interviewees concerning other research requests that they received prior to or after the interview conducted for this study. I tried to address this limitation through analytic autoethnography, which also helped me to make my involvement and intimate knowledge of the research context transparent. Future research could more explicitly and extensively make use of this research approach, potentially through experiential case encounter that guides the immersion of the research in the studied context for an extended time period (Scholz & Tietje, 2002). Fifth, another challenge I encountered through this research process resulted from my subjective handling of the voluminous data, navigating different and complementary sources, deciding on what interpretive frames to choose, what story to construct to make the analysis comprehensible to others, and what data to select for its support. Accordingly, I do not aspire to present a definite account of all the meanings revealed through this research or suggest that the trinity of knowledge, action, and learning has been exhaustively covered in small businesses in general or craft breweries in particular. To address this limitation, the deep involvement of two or more researchers throughout the research process would have been beneficial. However, it would not have eliminated the subjective handling of data, which is a defining element of interpretive research. Reflecting on these limitations, it could be argued that they undermine this whole endeavor, or one may appreciate the limitations for the particular insights they offer.

6.4 Opportunities for future research

Reflecting on my research journey, the thesis offers opportunities for future work to substantiate emerging trends and explore new areas. First, this research has been interpretive and descriptive in nature, and generated insights may contribute to designing similar research programs. Second, reflecting on this journey also helps to question some of the underlying assumptions that made this endeavor meaningful in the first place, offering suggestions for designing new research efforts. Building on these considerations, this section provides insights for both observations.

Throughout this research process, I observed that over time sustainability aspects became more prominently featured in the businesses that I analyzed as well as in their networks and in the industry as a whole. This manifested, for example, in small initiatives such as neighborhood clean-ups that a brewery would organize, the increased use of local or certified organic ingredients across multiple organizations, and formally organized networks and associations starting to increasingly address social and ecological dimensions of sustainability. These observations confirm the learning processes that I examined, yet shifting the focus to more tangible artifacts, experiences, and situations as catalysts for learning. Accordingly, future research could examine how these more tangible aspects crystallize meaning-making around a specific set of actions, how they draw on and build personal experiences, how they involve and develop skills and expertise, as well as how they mobilize and create narratives to guide future action. Such an investigation could make use of some of the methods that this research relied on to construct autoethnographic, video, and audio accounts of how action-artifact relationships engender new ways of seeing and engaging with sustainability.

Another area of fruitful research could result from understanding how small businesses mobilize sustainability as a meaning-making device to purposefully organize business operations. As I embarked on this research, initial informal conversations, and later interviews with the collaborating breweries, suggested that entrepreneurs often considered sustainability a foreign concept that was perceived as having relevance for transnational corporations only. At the same time, I observed through this research that craft breweries embodied sustainability in their actions, as they advanced specific efforts, ranging from zero waste initiatives to social inclusion and gender diversity without reporting on such initiatives through established channels that transnational corporations would employ. Moreover, breweries did not use vocabulary that would readily label these actions as sustainability initiatives. Accordingly, understanding how sustainability manifests in small businesses may require a close look at what they do rather than what they say. Future research could move

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beyond discursive and explicit aspects and pay close attention to how sustainability features materialize within specific contexts and how they are employed by a business to imbued operations with a social purpose, and how they are mobilized by a business for purposefully organizing operations. Addressing these questions empirically would offer interesting material for conceptualizing sustainability in small business comprehensively. Much research on sustainability in small business has focused on developing scorecards, reporting, and management frameworks for implementing respective initiatives. The proposed research focus would move beyond such managerial efforts to explore how meaning is created around sustainability aspects when small businesses intentionally design, collectively enact, and contextually realize actions. The knowledge conversion framework presented and expanded in Chapter 4 could support this research effort to focus attention on the learning process through which small businesses engage and advance sustainability ideas.

Finally, future research could also contribute to the pragmatist-informed perspective that I employed to better understand how actors may create the conditions that enable an intentional, deliberative, and experimental approach to pursue change for sustainability. This would focus research efforts on learning in relation to the 1) creative ability of actors, 2) procedural aspects of sustainability, and 3) geography of knowledge. Taken together, the three empirical chapters illuminate the unique ability of small businesses to engage collectively, within their network, and individually, within the respective organization, in open-ended learning processes. The businesses that I analyzed creatively address ill-defined problems where neither the solution path nor the aspired goals are clearly defined or known (i.e., demystifying an industrialized commodity, developing shared agency in innovating production methods, aligning a business purpose with social goals). While the craft brewery movement can serve to illustrate how an inquiry-driven approach to learning can enable productive action, a key research gap remains with respect to what kind of enabling conditions exists and how actors might create these beyond the studied industry and throughout the food sector. This thesis offers guidance to future research addressing these questions by illuminating the role of tacit and explicit knowledge in sustainability transformations. I also emphasize the importance of localized learning, the critical role of context, and the proximity of actors as contingent factors in this process. Accordingly, future research could build on this work by examining the genealogy of tangible and intangible assets that support learning processes. In this context, further examinations into the role of different notions of proximity and the multivocality of sustainability in learning processes are warranted (Boschma et al., 2017; Etzion et al., 2017).

At the end of this journey, I can reflect on the path I took and the direction in which I traveled. As I embarked on this interpretive research endeavor, I wanted to produce thick accounts of the meaning and concepts in use by people involved in small businesses. This is an academic exercise by nature. Yet, the purpose of interpretive research is also to organize the outputs and insights to offer them to those that have been part of the research process to stimulate reflection and further learning. Yet, if one is to take the pragmatist perspective that informed the conception of knowledge and action of this thesis seriously, it will be important to move beyond the 'transfer' of outputs and insights as they are, at the most, codified abstractions. In order to invigorate meaningful action, collective engagement is needed that blurs the lines between researchers and those who have been researched. This would imply the shared design and realization of a problem-focused inquiry. Many scholars have argued that in order to assume this reflexive and integrational role, sustainability research has to shape change processes as much as it observes them (T. R. Miller, Muñoz-Erickson, & Redman, 2011; van der Leeuw, Wiek, Harlow, & Buizer, 2012). Accordingly, I see opportunities for action research that is pursued in partnership with small businesses to foster sustainability transformations. Building on the research I presented, this would entail jointly constructing meaning categories for developing narratives, cooperatively mobilizing knowledge through processes that support niche construction, and together developing business strategies through intentionally designing, collectively enacting, and contextually realizing entrepreneurial action. This dissertation provides a solid and flexible springboard for me to venture in this type of endeavor in the upcoming future.

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Appendix A

The Interview Guide

Area of interest	Sub concept of interest	Questions

Purpose – action is pursued for specific reasons that have normative implications indicating underlying worldviews and beliefs	• Values and norms of the industry
	• Goals of the Business
	• Personal motivation
		1. When and where have you entered this industry and what sparked your initial interest?
		3. What would you say is the purpose of your business?
		   a. Who benefits from your business and in what ways?
		5. Since you have started [to work at] [enter business name], has your understanding changed of what the business purpose is?
		   a. How has your understanding changed?
		   b. What has sparked this change?
		14. Whom would you say is involved in determining the direction of your business (what should be improved or changed or into which new areas the business should develop)?
		16. What would you say is the role of your business in the local community?
		   a. Do you think that this understanding [of the 'functions' your business serves] is commonly shared by other businesses in your industry, if not, how does it differ?
		17. How do you motivate other people – be it customers, employees, or business partners – to get involved in [enter industry]?
		23. How would you see the contribution of your business to sustainability [social or environmental aspects]?
		   a. Do you have specific procedures in place to improve the resource efficiency of your operation, well-being (opportunities) of your employees, work environment, connect people to the biophysical environment through food products, democratic decision making?

Course of action – the actual doing to realize aims (i.e., purpose)	• Caused by an actor • Intentional as an action is intended to serve aims or can be justified accordingly • Particular as situated in a specific context (time and place)	4. You mentioned [enter aspect of business purpose] as part of your business purpose, how do your work toward achieving this aim? 12. As mentioned earlier, that (source of knowledge) is helping you overcome challenges or improve your business. Can you think of an example where you have changed something significant in your business and how these sources/people have helped you in doing so? a. Could you walk me through the process of how you decided about this change and the process through which you implemented/changed [enter respective element that was changed]? 18. Do you take specific action to help shape how the local community perceives your business?

Knowledge and learning – knowledge has different forms (explicit, tacit) and can require conversion processes that involve social learning	• Embodied knowledge
	• Abstract knowledge
	• improving processes
	• reframing assumptions
	• shaping worldviews
		6. Where did you work before you started to work here?
		   a. What past interests have led you to this job?
		7. Where have you learned about working as [position of participant]?
		8. If you run into challenges or look for new ways to do something, where do you turn to for help (e.g., information sources/people)?
		   a. How do they/does it help you?
		9. With whom would you say do you frequently collaborate, and for what purpose? Outside of your business? Within your business?
		21. How are ideas about the identity of the industry shared (e.g., personal interaction, social media, reports by industry organizations)?
		13. Can you think of an example involved in determining the direction is supporting your [enter industry or community of practice]? For example, sharing knowledge about how you do things in your business through presentations, social media, business networks, etc.
		   a. How does this support materialize?
		   b. What steps/ activities are involved in this support?
		19. Are you [or your business] trying to change the conversation in society about the role of your industry/industry product?
		15. Looking forward, what aspects of your business are your planning to change or improve (and why)?

Context – action and knowledge are always situated in a particular situation (in time and	• Accessibility and overlap of knowledge
	• Relationships, coordinated action, and collaborative learning processes
		2. What is the core focus of your work here?
		   a. What motivates you to run this business?
		   b. How does your daily work look like?
		   c. Are there any particular reasons why you chose this location for your business?
		20. How would you describe the culture at your organization? In the industry?
		10. Who do you consider included in your (local) business community?
		11. Who would you say are your competitors?
		   a. Who are your suppliers?

| place) that provides meaning | • Existence of networks
 • Beliefs, norms, values, rules
 • Real and perceived distance between actors and events | b. Where are your employees coming from?
 c. Are you a member of business associations or organizations that represent your interests?
 22. Can you imagine creating a branch of your business in another location (e.g., in the next city, in another province/state, in another country)? |

Appendix B

The List of Analyzed Audio and Video Podcast Episodes

Name of source	Description	Relevant publications	Link
Master Brewers Podcast	"Each week, thousands of brewers download the Master Brewers Podcast to hear interviews with the industry's best & brightest in brewing science, technology, and operations."	44	http://masterbrewers podcast.com/
The Business of Beer	"This podcast focuses on the business side of the craft beer industry. Andy Coppock interviews those who contribute to this 20 billion dollar industry. Hear stories from Brewers, Founders, Writers and Innovators!"	9	https://thebusiness ofbeer.simplecast.fm/
Craft Beer & Brewing Magazine Podcast	'Join professional brewers and industry experts, as we discuss: Exclusive interviews and advice from world-class brewers, practical advice from the best craft beer writers in the industry in-depth coverage of brewing trends that matter to you, and tips for getting the most out of your homebrew"	46	https://beerand brewing.com/podcasts/
The Brülosophy Podcast	"Focused on a specific topic important to homebrewers and professionals alike. In addition to discussing the history of the topic at hand, we go over the results of exBEERiments we've performed to provide a slightly more objective spin on things. Join us as we think beer!"	35	http://bru losophy.com/podcast/
The Sour Hour	„The Sour Hour is an in-depth look into the process of making wild ales. With the help of some of the best mixed-fermentation brewers in the world, the show discusses the techniques to make world class sour beer."	77	www.thebrewing network.com/shows/the-sour-hour/
BeerSmith Home Brewing Radio	"interviews on making beer with top home and professional brewers from around the world. The channel features brewing professionals, top brewing authors, competitive home brewers, craft brewers and personalities all dedicated to beer"	40	http://beersmith.com/radio/
Craft Beer Interviews	"Interviews mit Brauern der Craft Beer Szene. Weil hinter jeder Craft Beer Brauerei mindestens ein Brauer steckt der mit Leib und Seele, handwerklich und mit viel Liebe seine Biere braut. Wir wollen diese Brauer treffen und mit ihnen über die Themen India Pale Ale (IPA), die Craft Beer Szene in Deutschland und wie es ist eine eigene Craft Beer Brauerei zu besitzen sprechen"	20	https://itunes.apple. com/us/podcast/craft-beer-interviews/id1324 265743?mt=2
Farm To Bottle	A podcast about Canadian brewing ingredient producers	9	https://farmto bottlepodcast.com
Beer Down to a Science	„Explores the world of craft beer in a new way. Every month we sit down with experts in their field and dive deep into the science behind our favourite beverage. We'll tackle the nitty-gritty of yeast and hops, chat about trends and fads, and enjoy some tasty brews along the way"	5	https://www.stitcher.com/podcast/httpbeerdowntoasciencelibsyncomrss/beer-down-to-a-science#/
Milk the funk „the Podcast"	Milk the Funk "The Podcast" talks about mixed and alternative fermentation for beer, wine, mead, and cider. "The Podcast" is an extension of the Milk the Funk Facebook group and wiki, where you will find the most up to date discussion on the science and techniques of mixed fermentation. The goal of Milk the Funk "The Podcast" is to cover the science we talk about in Milk the Funk, and to give some airtime to members who are involved in our group, including scientists, professional brewers, homebrewers, and beer historians. Our focus will be on specific topics discussed on the group page and bringing guests who we see our experts or innovators in that topic.	14	https://www.milkthefunk.live/pod cast
Craft beer & friends	In den Sendungen sprechen Oliver und Yannick über Biere, Bierherstellung, Craft Beer und Hobbybrauen.	9	https://craftbeer.works/
Hhopcast - der Craft Beer Podcast	Bock auf Bier? Also wir schon! Wir sind Regine und Stefan. Die eine schreibt (auch über Bier), der andere macht Musik – und zusammen sind wir auf Biermission. Wir nehmen euch mit zu den Brauern und Machern der Szene. Denn wir wollen wissen, wer DIE LEUTE HINTER DEN BIEREN sind. Wir besuchen die Macher quasi in ihrem Wohnzimmer. In ihren Brauereien, ihren Stores, ihren Bars. In unseren Städte Editions geben wir euch einen Einblick in die lokalen Bierszenen, stellen euch die Local Heroes der dortigen Brauszene vor. Wir sind hopfenbeseelt und derbe neugierig, lieben gutes Bier und die Leute, die machen,	13	https://hhopcast.de/

	wagen, was wollen. Und genau deshalb gibt's HHopcast. Hört hier mal rein!		
BAOS: Beer and Other Shhh Podcast	Aussie Cee and Canuck Scott 'Beer' Cole are just a couple blokes helping you understand and enjoy craft beer, one pour at a time. Together they host BAOS Podcast, a fun podcast and video series aimed at the newcomers to craft beer, interviewing everyone from brewers, brewery owners, DJs, musicians, comedians, entrepreneurs and everyone in between. Based between Toronto and Montreal, they cover beers from around the planet, bringing an educated novice perspective to those newer to beer without all the pretension and beard-stroking. Though they do enjoy stroking their beards from time to time.	5	https://www.baospodcast.com/podcast
Good Beer Hunting	GBH is not a voice speaking only from the outside looking in, but rather, from the middle of some of the most rapidly changing dynamics that any U.S. industry has ever seen. The interviews go deeper and the articles work harder to balance the culture of craft beer with the businesses it supports, shifting the conversation with our readers toward the future of the industry we love and the tenacity of its ideals.	26	https://www.goodbeerhunting.com/gbh-podcast

Appendix C

The Coding Scheme

Category	Category focus	Reference	Sub-category	Definition	Coding rule
Socialization	Learning process that allows people to gain knowledge through participating and being there, enacting the knowledge to be learned, and aligning their practical skills and techniques. This also involves the sharing of routines and cognitive frames	(Calka, 2017; Mohajan, 2016; Nonaka, 1994; Raman & Mohr, 2014; Schot & Geels, 2008)	Formal	Learning occurs when engaged in a structured syllabus with predetermined objectives and pedagogy	Assign to a text that refers to learning through formal education
			Casual	Learning that is unplanned and acquired by pursuing an unrelated objective	Assign to a text that refers to a structured activity but learning occurs with regard to an unrelated objective.
			Informal	Learning that is unintentional and happens when participating in the gathering of social groups and events	Assign to a text that refers to learning through participation in social events where learning lacks specific objectives and structure
			Intimate	Also referred to non-formal learning that occurs by pursuing a specific objective but lacks any specific structure for how it is acquired	Assign to a text that refers to learning that occurs through following along and activities has a clear objective but lacks specific structure
Externalization	Learning process involved in making personal knowledge readily accessible to others through conceptualizing, figurative speech, comparison, and the use of symbols to articulate tacit knowledge. This also involves articulation of symbolic and cultural meanings as well as expectations of future benefits and visions	(Coenen et al., 2010; Lawrence & Valsiner, 2004; Nonaka & Toyama, 2003; Schot & Geels, 2008)	Figurative	A phrase that caries in addition to its literal definition a separate meaning like a metaphor or double entendre	Assign to a text that refers to or uses figurative speech such as a metaphor, analogy or double entendre for describing an action
			Conceptual	Abstract simplification of activities that describe a specific perspective or process	Assign to a text that refers to abstract simplifications of an action or idea to describe a specific perspective or process
			Visual	Making something internal to the niche accessible to outsiders through visualization	Assign to a text or artifact that refers to making an internally known idea or action visible through photo- and videography
			Symbolic	Displaying a shared reality and understanding as well as asserting a particular identity and alternative perspectives by using symbols to communicate more than is initially perceived	Assign to a text or artifact that that refers to the use of symbols (words, sounds, gestures, images) to convey a shared understanding, idea, or activity

Combination	Learning processes that are involved in internalizing already existing knowledge. Here, learning-by-doing, practically applying, and operationalizing are activities involved in embodying abstract knowledge. This also involves translating generic knowledge into practical application, changing routines and practices to accomplish objectives.	(Borghei & Magnusson, 2018; Dijk, 2014; Dyer & Nobeoka, 2000; Geels & Deuten, 2006; Nonaka & Teece, 2001)	Accumulative	Collecting abstract knowledge by reaching out and adding someone else's expertise to an existing repository	Assign to a text that refers to the process of developing a repository or advance a person's understanding by building on someone else's expertise.
			Integrational	Combining knowledge so as to complete the understanding of an action	Assign to a text that refers to the process of completing an understanding of an action or idea by drawing on existing knowledge
			Creative	Synthetizing of existing knowledge to create a new way of doing	Assign to a text that refers to the synthesis of existing knowledge to outline a (new) process step or procedure
			Disseminative	Disseminating of systematized knowledge through established communication channels	Assign to a text that refers to the dissemination of organized knowledge through established communication channels.
Internalization	Learning processes that are involved in internalizing already existing knowledge. Here, learning-by-doing, practically applying, and operationalizing are activities involved in embodying abstract knowledge. This also involves translating generic knowledge into practical application changing routines and practices to accomplish objectives	(Hansen & Nygaard, 2014; Lawrence & Valsiner, 2004; Nonaka & Takeuchi, 1995; Raven & Geels, 2010)	Contextual	Covers activities that allow for the already learned to be applied in a new context (also learning by doing)	Assign to a text that refers to the practical application of a recommendation or instructions within a specific context.
			Referential	Learning in different contexts provides a reference to better understand a given situation at hand	Assign to a text that refers to the process of extrapolating from action and ideas learned in different contexts for evaluating and appropriately acting in a given situation.
			Inspirational	A concept or idea that have been observed to work in a specific context is implemented in a new situation	Assign to a text that refers to the use and modification of knowledge that works in a specific context to guide its replication in a new situation
			Supportive	Implementation is supported by third parties that have experience in mastering the activity at hand	Assign to a text that refers to an experienced third party that supported the implementation of an action.
Intentional design	The action dimension that supports entrepreneurs to intentionally design experiments for sustainability, creating environmentally and socioeconomically improved situations, increasing future opportunities (Schaltegger et al., 2018; P. Wells, 2016). This means that action-oriented knowledge is prescriptive of the direction of action, strategic for generating long-term benefits, and synthetic to create new arrangements and situations in support	(Dutton, Ashford, O'Neill, & Lawrence, 2001, p. 732; Ford & Ford, 2002)	Prescriptive	Knowledge recommends and prioritizes action in support of a specific solution that reflects intentions, suggesting what action is preferable to realize a certain vision of a more sustainable future	Assign to a text that refers to a judgment or value statement about an action.

				Knowledge that proactively outlines the sequence of action and aligns it with contextual particularities to realize intentions over time.	Assign to a text that refers to the sequence of action that was undertaken to accomplish a specific goal.
	of sustainability (Caniglia et al., forthcoming).	(Bansal & DesJardine, 2014; Dutton et al., 2001; Hamel & Prahalad, 1989)	Strategic	Knowledge that proactively outlines the sequence of action and aligns it with contextual particularities to realize intentions over time.	Assign to a text that refers to the sequence of action that was undertaken to accomplish a specific goal.
		(Pina & Tether, 2016; Souto, 2015)	Generative	Knowledge that supports the creative development of alternative futures in the form of cultural, institutional, social, economic, and ecological situations and moves beyond constraints of current arrangements.	Assign to a text that refers to alternative situations that are pursued to break with prevailing arrangements and situates solutions.
Shared agency	The action dimension that supports entrepreneurs in collectively enacting experiments for sustainability, moving beyond the narrow focus on stakeholder wealth, and re-envision what collective value creations involve (T. Busch et al., 2018). This means that action-oriented knowledge requires critically engaging with prevailing social dynamics, empowering actors to enact intentionally designed changes, and co-create knowledge in support of how-to act by incorporating and building on the divergent interests involved in such undertakings (Caniglia et al., forthcoming).	(Ählström, Macquet, & Richter, 2009; T. Busch et al., 2018, pp. 211, 217; Marcus, Kurucz, & Colbert, 2010)	Critical	Knowledge that questions established ways of thinking and doing, interrogating what a business is and whom it serves, and reflects on ways to bring on alternative arrangements that restore marginalized values	Assign to a text that refers to statements that question business as usual, established beliefs, and special interests, reflecting on and reasoning for alternative ways of doing things
		(Schön, 1983, pp. 40–41; Zollo et al., 2013)	Empowering	Knowledge that supports building capacity in people to enact alternative mindsets, question assumptions, and develop alliances to work towards specific goals.	Assign to a text that refers to action that supports people in developing skills, competencies, and practices as well as reports on collaborations with other initiatives to join forces.
		(Baumard, 2002; T. Busch et al., 2018; McDermott, Kurucz, & Colbert, 2018; Mcdonald, Khanna, & Westphal, 2008)	Co-created	Knowledge that results from collective action that integrated diverse perspectives and negotiated interests in building opportunities for value creation.	Assign to a text that refers to action that involves different people from different initiatives in the process of accomplishing a specific goal
Contextual realization	The action dimension that supports entrepreneurs in contextually realizing experiments for sustainability is embedded in and tailored to the needs and expectations involved in generating local solutions (Dogan & Walker, 2008; Westman et al., 2019). Accordingly, action-oriented knowledge is necessarily emergent as it supports and is generated through experimentation, tactical as it utilizes and creates contextual diversity and differences,	(F. Murray & Tripsas, 2004; Stuiver et al., 2004)	Emergent	Knowledge that emerges from iterative testing and refinement of action, deepening understanding of underlying processes, and informing future goal setting and activities.	Assign to a text that refers to experiential learning to improve ways of doing, monitoring activities, and reflections on the ability of an action to reach desired outcomes

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				Knowledge that supports building partnerships and alliances, utilizing tangible and intangible assets, and harnessing local conditions	Assign to a text that refers to the use of local resources for advancing collaborative efforts
and situated in local experiences essential to joint sensemaking of new and altered conditions (Caniglia et al., forthcoming).		(Loorbach & Wijsman, 2013; Westley et al., 2013)	Tactical	Knowledge that supports building partnerships and alliances, utilizing tangible and intangible assets, and harnessing local conditions	Assign to a text that refers to the use of local resources for advancing collaborative efforts
		(S. Wells & Quartey, 2017; Westman et al., 2019)	Situated	Knowledge that is experiences based as it is gained by actors engaged in social interaction and embedded in the local context to appropriately respond to changed circumstances	Assign to a text that refers to utilizing local experiences to support a specific action
Passion as a purpose	Passion as purpose speaks to the broader meaning of work that is pursued primarily as a personal expression and secondarily as a source of income. It captures the deliberate orientation of the business as a place that actively supports the well-being of its stakeholders. Yet, the purpose is not seen as a personal manifestation but as a broader initiative that unites collaborative efforts in pursuit of a common goal.	Analysis of secondary material			Assign to a text that refers to the orientation of a business detailing beliefs, motivations, and activities that manifest in and are expressed through its purpose.
Collaboration as a means for differentiation	Collaboration as a means for differentiation speaks to the broader meaning of collaboratives activities. It captures the motivation to see others flourish and the pursuit of continuous learning. It not only refers to the development of a business in relation to other (similar) businesses (product differentiation) but to the underlying idea of using collaborations in support of being different and encouraging diversity.	Analysis of secondary material and domain summary			Assign to a text that refers to the collaborations between businesses, detailing the personal experience of participants, learning, and experimenting that is supported through collective action.
Changing the conversation and societies relationship with beer	Changing the conversation and society's relationship with beer speaks to the agenda of breweries to fundamentally transform the role of beer in society. This includes motivational, substantive, and procedural aspects as well as interactions between stakeholders of a brewery and the role of breweries in communities.	Analysis of secondary material			Assign to a text that refers to articulations of the underlying meaning of action toward customers, the local community, and the broader movement
Purposeful engagement with communities	Purposeful engagement with communities speaks to the relational dynamics of breweries. It captures internal relationships among works as well as external relationships with the local community and the industry. As breweries purposefully engage each of these communities with/through different intentions, collaborations, and meaningful action, it supports the pattering of activities that collectively shape the identity of a brewery that is oriented toward purposeful social change.	Analysis of secondary material and open coding			Assign to a text that refers to the action that supports purposeful social change within breweries as well as within their local communities and the industry

Competition	Competition refers to the relationship between businesses, how they perceive each other in terms of rivalry, and the role a brewery reportedly plays in the relevant context (e.g., competitiveness, contention, conflict). It can also include alternative framings of the conventional understanding of competition.	Domain summary			Assign to a text that refers to a brewery's competitive relationship with other breweries, how they are perceived, and what attributed role they play.
Collaboration	Collaboration refers to friendly interaction between business, if and how they collaborate, and for what reason. This may also include collaborations with businesses from other sectors.	Open coding			Assign to a text that refers to collaborations a brewery carries out with other businesses, including motivations and reasons for the collaborations.
Business purpose	Business purpose refers to the underlying logic of a business, what it is aiming to achieve through operating and offering its goods and services (values proposition), the activities that are carried out in the creation and delivery of values, and who benefits in what ways from it.	Open coding			Assign to a text that refers to the orientation of a business, what people working for the business assume as its purpose, and the activities they attribute to its delivery.

Appendix D

The List of Analyzed Material – Chapter 3

Abbreviations refer to the empirical reference, country, and the respective number. The type of empirical reference included interviews (I), episodic video or audio series conversations (E), photo or video posts (P), websites (W).

#	Code	Description	Date	Location
1	IG1	Interview with co-owner brewpub	June 5, 2018	Germany
2	IG2	Interview with co-owner brewpub	June 6, 2018	Germany
3	IG3	Interview with co-owner brewpub	June 20, 2018	Germany
4	IG4	Interview with co-owner microbrewery	August 30, 2018	Germany
5	IG5	Interview with co-owner and brewer of microbrewery	June 21, 2018	Germany
6	IG6	Interview with two co-owners microbrewery	June 7, 2018	Germany
7	IG7	Interview with regional brewery manager	June 6, 2018	Germany
8	IG8	Interview with regional brewery manager	August 30, 2018	Germany
9	IG9	Interview with co-owner microbrewery	August 29, 2018	Germany
10	IG10	Interview with co-owner microbrewery	June 4, 2018	Germany
11	IG11	Interview with two co-owner microbrewery	May 4, 2018	Germany
12	IG12	Interview with co-owner beer shop	June 21, 2018	Germany
13	IG13	Interview with founder of brewery association	August 29, 2018	Germany
14	IG14	Interview with co-owner microbrewery	December 27, 2019	Germany
15	IC1	Interview with head brewer regional brewery	July 26, 2018	Canada
16	IC2	Interview with co-owner brewpub	November 26, 2018	Canada
17	IC3	Interview with co-owner microbrewery	November 20, 2018	Canada
18	IC4	Interview with co-owner microbrewery	August 10, 2018	Canada
19	IC5	Interview with co-owner microbrewery	May 31, 2018	Canada
20	IC6	Interview with co-owner microbrewery	May 17, 2018	Canada
21	IC7	Interview with co-owner microbrewery	July 31, 2018	Canada
22	IC8	Interview with co-owner brewpub chain	December 4, 2018	Canada
23	IC9	Interview with co-owner microbrewery	May 23, 2018	Canada
24	IC10	Interview with co-owner microbrewery	May 16, 2019	Canada
25	IC11	Interview with co-owner microbrewery	March 26, 2019	Canada
26	IC12	Interview with co-owners of two different microbreweries	May 8, 2019	Canada
27	IC13	Interview with co-owners of two different microbreweries	May 23, 2019	Canada
28	IC14	Interview with industry expert	May 30, 2019	Canada
29	IC15	Interview with shareholder of brewpub chain	December 1, 2019	Canada
30	IC16	Interview with co-owner microbrewery	March 29, 2019	Canada
31	WC1	Website of regional brewery	September 12, 2019	Canada
32	WG1	Industry blog	April 27, 2019	Germany
33	PC1	Post shared through photo and video sharing website	September 10, 2019	Canada

Appendix E

Overview of Analyzed US-based Audio and Video Podcasts

Name of source	Description	Relevant publications	Link
Master Brewers Podcast	"Each week, thousands of brewers download the Master Brewers Podcast to hear interviews with the industry's best & brightest in brewing science, technology, and operations."	34	http://masterbrewers podcast.com/
The Business of Beer	"This podcast focuses on the business side of the craft beer industry. Andy Coppock interviews those who contribute to this 20 billion dollar industry. Hear stories from Brewers, Founders, Writers and Innovators!"	9	https://thebusiness ofbeer.simplecast.fm/
Craft Beer & Brewing Magazine Podcast	'Join professional brewers and industry experts, as we discuss: Exclusive interviews and advice from world-class brewers, practical advice from the best craft beer writers in the industry in-depth coverage of brewing trends that matter to you, and tips for getting the most out of your homebrew."	35	https://beerand brewing.com/podcasts/
The Brülosophy Podcast	"Focused on a specific topic important to homebrewers and professionals alike. In addition to discussing the history of the topic at hand, we go over the results of exBEERiments we've performed to provide a slightly more objective spin on things. Join us as we think beer!"	35	http://bru losophy.com/podcast/
The Sour Hour	"The Sour Hour is an in-depth look into the process of making wild ales. With the help of some of the best mixed-fermentation brewers in the world, the show discusses the techniques to make world class sour beer."	67	www.thebrewing network.com/shows/the-sour-hour/
BeerSmith Home Brewing Radio	"interviews on making beer with top home and professional brewers from around the world. The channel features brewing professionals, top brewing authors, competitive home brewers, craft brewers and personalities all dedicated to beer."	38	http://beersmith.com/radio/
Milk the funk "the Podcast"	Milk the Funk "The Podcast" talks about mixed and alternative fermentation for beer, wine, mead, and cider. "The Podcast" is an extension of the Milk the Funk Facebook group and wiki, where you will find the most up to date discussion on the science and techniques of mixed fermentation. The goal of Milk the Funk "The Podcast" is to cover the science we talk about in Milk the Funk, and to give some airtime to members who are involved in our group, including scientists, professional brewers, homebrewers, and beer historians. Our focus will be on specific topics discussed on the group page and bringing guests who we see our experts or innovators in that topic.	10	https://www.milkthefunk.live/podcast
Good Beer Hunting	GBH is not a voice speaking only from the outside looking in, but rather, from the middle of some of the most rapidly changing dynamics that any U.S. industry has ever seen. The interviews go deeper and the articles work harder to balance the culture of craft beer with the businesses it supports, shifting the conversation with our readers toward the future of the industry we love and the tenacity of its ideals.	13	https://www.goodbeerhunting.com/gbh-podcast
The Business of Craft Beer	The Business of Craft Beer Podcast is hosted by Gregory Dunkling, director of the University of Vermont Business of Craft Beer online certificate program. We continually examine today's craft beer sector in the U.S. Whether you are looking to break into the craft beer industry or looking to start your own craft brewery this podcast is for you. With the number of U.S. craft breweries exploding from just 8 in 1980 to 6000+ as of 2017, our podcast interviews brewery owners across the country to hear their stories and better understand factors leading to sustained, healthy growth of independently owned breweries.	5	go.uvm.edu/beercast

Appendix F

Illustrative Quotes from Secondary Data Analysis

"When we started the focus on local. Back then, I think that was something that was only starting to gain traction. We were really small, we started on a tiny budget, and we wanted to focus on using Colorado ingredients because that's what the Belgian did. Because in farmhouse brewing, you made beer with what your neighbors grew, they traded yeast cultures and all that. So that was what we started with and what we still mostly do today … We found a lot of smaller growers. That's that grow the really boutique organic stuff that we're looking for. So it was basically just meeting growers, we used to start by going to farmers markets, talking to the growers, finding out what they grow to the point of asking people: 'Hey, can we buy you a thousand raspberry plants to plant for us and we'll put that money upfront. If and when you get a crop, because it's not always guaranteed, if and when you get a crop will, take ten percent off our orders until that's paid.' That's basically a debt-free or an interest-free loan to get the fruit that we're looking for. And yeah, I mean we use almost every fruit we can find in Colorado we've tried, there's only a handful that we haven't, so we'll get there. But yeah, we just look for quality. Right. We talked with Grower sand the are like 'when do you want the fruit?' and I'm like 'you tell me so when can you pick it? I'm not in a rush. I care about quality, and if you have to deliver on a Sunday morning at 7 a.m. on your way to church, I'll meet you at the brewery.' Which we've done many times. We pay a lot for our fruit compared to what you could get even in Colorado, let alone at Whole Foods. We're often buying organic, and that's not necessarily out of desire. It's out of quality, and the people who are growing it, they really care about it. They're growing organic because they obviously really care and that costs a premium. And whatever fruit you're getting it's a matter of when do you process it. That's the biggest part for us. So, waiting to process it when it's at its peak ripeness, and that happens at the most inconvenient times. So, I remember last year, we got some nectarines, I think, and it was just me and [Name] and we were finishing up, and it was probably three o'clock, and both of us were like, alright, good its Friday and we can go home. I looked at these nectarines, and they were starting to turn, and we'd already lost probably 10% of the 800 pounds, and luckily, we had an empty tank. So we saw these nectarines, and we got about seven hundred pounds. We knocked them out late at night and then we had to rack beer onto those. And we released this beer last year and it was a bourbon East Bank nectarine preserves. And you know, you had to do it otherwise we would've lost all that fruit. So you know the cost of that fruit is one thing, but the beer that you had, you know, the growers we work with are so small the window of opportunity is next to nothing. So like this year, we ordered 10,000 pounds of apricots from one grow from the Western slope … and it ripened on the second day of our fifth year anniversary this year, and we had five days to celebrate our anniversary this year, but we were processing apricots every day. We started at 7 a.m. and we're processing whatever we could, you had to go through every single box to pull the ripe apricots. And then the next day you do the same thing, finding the right ones, and next day same thing. Say labor of love and I mean, that's the truth, but… In early June, when the California apricots hit Whole Foods, I start shaking because I just know that I ours are coming soon. And I don't even eat apricots anymore. I don't eat peaches at home anymore. I eat a lot of apples because we don't make any beer… its fruit trauma. But you get a by working with a grower that is a generational grower. You've got in contact with their mom and now you're working with her children you hear how your purchase is affecting their business their family. You're paying a premium for it, obviously, and you hope your customer can get excited about it as much as you are and you're getting a different product than if you buy a puree or a flavoring. I don't care, you could make a great product with those, but it's different and that's how we want to make beers … and fortunately were able" (Owner of a small craft brewery in Colorado, interviewed on industry on July 19, 2019)

"For me, it [the brewery] has always been around being transparent, being compassionate, and being a space that is welcoming. And obviously, being inclusive is important, and that's something that is always talked about but I think it has to start intention before just saying like 'we're inclusive space.' Because, 'hey, what are you actually doing there?' Do you have a space that's approachable? do you have staff that's not intimidating? Do you have people that genuinely want to talk and not just talk about beer? A lot of this I took from the running industry, you know, the fitness scene, I think [gym name] is an incredible example of a community while it may seem off-putting to a lot of people anyone that for the first time and goes into [gym]. I mean you are treated like royalty like you are part of the tribe and that's huge. … … and you feel like you belong there… for me, this is bigger than just the liquid, beer is a space that I think more people can get excited about and be passionate about. It can create really great jobs. It's a place that generally doesn't talk about politics … for the most part, it shies away from all of the really like nasty conversations … that are incredibly polarizing. Beer should be the thing that we all have fun with but it shouldn't be the only thing we have fun with. … Beer can be there and not having to be the dominant thing and it's difficult to create a community where beer is just a piece of it when beer is your sole source of revenue. But that why we partner with not-for-profit, with local organizations. That's what we try to do. One of my favorite events that we do every year is called 'Chingona' in the Hispanic culture it is an interesting word… it's basically translated to 'badass female,' it's not a word that that a lot of the older Latinas like to use but the younger crowd, they want to be empowered and they want to show that 'hey, we don't need to be marginalized anymore.' We make a beer for this big Festival. We bring in musicians and artists from all over and we open our doors. We make like a [large quantity] of this beer and we give half of the price of the cans back to really cool charities in East Austin [like] they're there to empower young Latinas into leadership. And that's the kind of stuff that sure beer is a part of that and it's a beer that we made in collaboration. But only like half the people there are drinking but they're all coming out and supporting artists because this is our community, you know, and that's what I want. Beer to be not the focal point, but the supporting role" (Owner of brewpub in Austin Texas interviewed on industry podcast on September 14, 2019)

"You know, this [homebrew group on social media] and the people from [specialty beer blog], there are so many people that have contributed to this [technical brewing book]. They were so helpful … We are in a great industry where people come together and share information that way and I always like to encourage other brewers too: 'if you got a problem or question reach out to your fellow brewers reach out to your neighbor and I encourage those people that get reached out to, to respond in a positive way because we're all

community, you know, 'high tide floats all boats,' and that's the great thing about our industry." (Brewmaster at a regional brewery in California and author on industry podcast on June 28, 2019)

"We've just come to the conclusion that we are now almost more of a hospitality company than a brewery. That is our main goal. We're trying to take care of people that come here and so much of our business is direct customer and we've realized that we have to focus our energies on making sure that people feel taken care of and that when they stand in line [for hours] that they're going to get the beer they want. We've worked really hard to streamline all of our processes and make the lines short. And also we're tried to make more beer because ultimately, thing that solves a lot of the problems is making beer available to people and it's kind of cool to have people freak out and wait in line and you blow through all the beer in two hours and you're done and, you know, your ego loves that. You're like, 'oh, that's cool. Everybody loves our beer,' but you realize that there are so many people that are missing out on the opportunity to try the beer. So we've been striving to make more beer and make it more accessible. We still have some crazy releases like obviously our fifth anniversary was insane, right and that's not how it's around here. Typically, on a Saturday there will be people here waiting in line. They'll buy some beer and then we'll have some beer leftover and then people come all day long and buy the remaining beer because they know now they don't have to [wait in line]. But I think what people need to realize that the line culture is not just about the beer. Everybody is like 'why would anybody wait in line for beer? That's crazy.' But that's not what it is. It's about the community that builds up around it. I always compare it, obviously on a much smaller scale, to like a Grateful Dead concert where people were traveling around and following this thing and these people they form community and friendships and everybody's doing it because they like hanging out together. And that's really what's happened with our customers they are very involved with each other. They hang out they come here because they want to see each other and hang out and it's not just about it's not just about the beer we're selling it's about the community that has come up around it. So, a perfect example of this was for our anniversary release we did a lot of [collaborative brewing]. We had done those over the years with other breweries and that [we took rereleased some of that beer] so it was kind of a curated list. And we actually let some of our best customers do our [social media posts so they wrote the post they took the photos they prepped it all. First, they were excited to do it. And then when they posted it and their friends saw that they had done the post for it so then they were like excited for each other and like just the amount of energy around that and how excited people were and just the positivity. It was amazing. And kind of we knew that was there but the watching that, it was incredible. These are I mean, these are the people that keep our lights on. We just see it as our duty, I want them to have the best experience they possibly can have" (Co-owner of microbrewery in New York interviewed on industry podcast on February 22, 2019)

That is correct. They [large foreign-owned craft brewery] opened 18 months ago. They are just about three minutes away. They've been really good to us. They were early adopters of our tasting room and they showed up on our first canning day. There is this story: we had a DIN fitting on one of our racking arms of our tanks that was just not going to anymore that day and we were about to K.O. into it so we were three hours away from just dumping the entire batch. So we talked to our friend over there [large brewery] he runs the filtration stuff and he got us that fitting because they had them lying around. I know we should have them lying around but as brewing goes you often don't have exactly what you need right then. And then if that didn't work they [Team at large brewery] offered to send their in-house stainless sanitary welder over to hack it off and weld a new one on before we K.O. I mean if that is not neighborly I don't know what is. They have been really good to us. (Co-owner and head brewer of small craft brewery in Richmond interviewed on industry podcast on November 9, 20018)

Appendix G

The List of Interview Questions

1. When and where have you entered this industry?
2. What would you say is the purpose of your business?
3. Where did you work before you started your business?
4. Where have you learned about working as [position of participant]?
5. If you run into challenges or look for new ways to do something, where do you turn to for help (e.g., information sources/people)?
6. With who would you say do you frequently collaborate, and for what purpose?
   > a. Outside of your business? / b.   Within your business?
7. Who do you consider as being part of your local business community?
8. Who would you say are your competitors?
   a. Who are your suppliers?
   b. Where are your employees coming from?
   c. Are you a member of business associations or organizations that represent your interests?
9. As mentioned earlier, that (source of knowledge) is helping you overcome challenges or improve your business. Can you think of an example where you have changed something significant in your business and how these sources/people have helped you in doing so?
10. Can you think of an example where you or your business is supporting your community of practice
    a. How does this support materialize/ what are specific outcomes?
    b. What steps/ activities are involved in this support?
11. What role does your business play in the local community?
12. Do you take specific action to help shape how the local community perceives your business?
    a. How do you stay up to date on industry trends?
    b. Which businesses do you consider industry leaders in your area?
13. Are you [or your business] trying to change the conversation in society about the perception of what breweries are or beer is?
14. How would you describe the culture at your organization?
15. How are ideas about the identity of the industry shared (e.g., personal interaction, social media, reports by industry organizations)?
16. How would you see your business contributing to
    > a. environmental aspects / b.   social aspects

Appendix H

The List of Analyzed Material – Chapter 4

Abbreviations refer to the empirical reference, country, and the respective number. The type of empirical reference included interviews (I) or photo or video posts (P).

#	Code	Description	Date	Location
1	IG1	Interview with co-owner brewpub	June 5, 2018	Germany
2	IG2	Interview with co-owner brewpub	June 6, 2018	Germany
3	IG3	Interview with co-owner brewpub	June 20, 2018	Germany
4	IG4	Interview with co-owner microbrewery	August 30, 2018	Germany
5	IG5	Interview with co-owner and brewer of microbrewery	June 21, 2018	Germany
6	IG6	Interview with two co-owners microbrewery	June 7, 2018	Germany
7	IG7	Interview with regional brewery manager	June 6, 2018	Germany
8	IG8	Interview with regional brewery manager	August 30, 2018	Germany
9	IG9	Interview with co-owner microbrewery	August 29, 2018	Germany
10	IG10	Interview with co-owner microbrewery	June 4, 2018	Germany
11	IG11	Interview with two co-owner microbrewery	May 4, 2018	Germany
12	IG12	Interview with co-owner beer shop	June 21, 2018	Germany
13	IG13	Interview with founder of brewery association	August 29, 2018	Germany
14	IG14	Interview with co-owner microbrewery	December 27, 2019	Germany
15	IC1	Interview with head brewer regional brewery	July 26, 2018	Canada
16	IC2	Interview with co-owner brewpub	November 26, 2018	Canada
17	IC3	Interview with co-owner microbrewery	November 20, 2018	Canada
18	IC4	Interview with co-owner microbrewery	August 10, 2018	Canada
19	IC5	Interview with co-owner microbrewery	May 31, 2018	Canada
20	IC6	Interview with co-owner microbrewery	May 17, 2018	Canada
21	IC7	Interview with co-owner microbrewery	July 31, 2018	Canada
22	IC8	Interview with co-owner brewpub chain	December 4, 2018	Canada
23	IC9	Interview with co-owner microbrewery	May 23, 2018	Canada
24	IC10	Interview with co-owner microbrewery	May 16, 2019	Canada
25	IC11	Interview with co-owner microbrewery	March 26, 2019	Canada
26	IC12	Interview with co-owners of two different microbreweries	May 8, 2019	Canada
27	IC13	Interview with co-owners of two different microbreweries	May 23, 2019	Canada
28	IC14	Interview with industry expert	May 30th	Canada
29	IC15	Interview with shareholder of brewpub chain	December 1, 2019	Canada
30	IC16	Interview with co-owner microbrewery	March 29, 2019	Canada
31	PC1	Post shared through photo and video sharing website	June 13, 2019	Canada
32	PG1	Post shared through photo and video sharing website	June 14, 2019	Germany

Appendix I

The Coding Scheme for Analyzing Entrepreneurial Action

Coding scheme for examining the knowledge that supports entrepreneurial action. Categories are adopted from the literature (Caniglia et al., forthcoming; Ferraro, Etzion, & Gehman, 2015) and subcategories are defined based on the literature.

Category	Subcategory	Definition	Literature
Intentionally design	Prescriptive	*Prescriptive* knowledge deals with prioritization of opportunity and problem settings to orient action toward generating specific solutions. It is here that "change takes place in conversions" as intentions are externalized to differentiate and identify solutions and the course of action that should be undertaken to realize a sustainability vision	(Dutton et al., 2001, p. 732; Ford & Ford, 2002)
	Strategic	*Strategic* knowledge deals with proactively aligning action with contextual particularities to enable the long-term strategic orientation of a business. Accordingly, action aims to proactively manage and align resources necessary for accomplishing solutions across time, recognizing uncertainties and limit controllability in working toward sustainability	(Dutton et al., 2001) (Bansal & DesJardine, 2014; Hamel & Prahalad, 1989)
	Generative	*Generative* knowledge is solution-driven (as opposed to analytical knowledge) and supports the creative development of alternative futures, moving beyond the constraints of current arrangements. It deals with anticipatory action in support of how the world could look like and "breaks with what existed previously," involving the reimagining of artifacts, social arrangements, and cultural meanings	(Pina & Tether, 2016; Souto, 2015, p. 114)
Shared agency	Critical	*Critical* knowledge questions established ways of thinking and doing, interrogates what a business is and whom it serves, and reflects on ways to bring about alternative arrangements that restore marginalized values. This is rarely a focus in scholarly debates on businesses as neoclassical assumptions are adopted without critically engaging in "reorienting and redefining, what is meant by value creation … what types of value are created and what values are important to the various stakeholders" which is crucial for making progress on sustainability	(Ählström et al., 2009; T. Busch et al., 2018, pp. 211, 217; Marcus et al., 2010).
	Empowering	Knowledge that *empowers* entrepreneurs to enact alternative framings relies on their ability to construct them "from the materials of problem situations which are puzzling, troubling, and uncertain [to] clarify both the ends to be achieved and the possible means of" how to achieve them.	(Schön, 1983, pp. 40–41; Zollo et al., 2013)
	Co-created	This necessitates *co-produced* knowledge, integrating diverse perspectives, negotiating divergent interests, and aligning different viewpoints through experimentation to construct opportunities for the business to create value for stakeholders and guide collective agency in change toward sustainability.	(Baumard, 2002; Busch et al., 2018; Donald et al., 2008; McDermott et al., 2018).
Contextual realization	Emergent	*Emergent* knowledge is open-ended and spirals from regular and experimental practices involving interventions and monitoring of effects across time to inform new action, evaluations and adjustment. "In this way [the entrepreneur] learns by doing and does through learning."	(Stuiver et al., 2004, p. 102)
	Tactical	*Tactical* knowledge involves the building of partnerships and alliances, utilizing tangible and intangible assets, and harnessing local conditions to support orienting the venture toward the desired direction.	(Loorbach & Wijsman, 2013; Westley et al., 2013).
	Situated	*Situated* knowledge is experiences-based as it is gained by entrepreneurs engaged in continued collaborations and transactions. It is the embeddedness of entrepreneurs in the local context that supports them to "frame and solve societal problems through experimentation, social processes and reflexivity."	(S. Wells & Quartey, 2017, p. 263)