

Towards a Cohesive Circular Food Economy: An MOA Approach to Understanding Stakeholder Perspectives in Metro Vancouver

**by
Emily Burkholder**

M.A. (Interdisciplinary Studies), Royal Roads University, 2023
B.S.Sc., University of Ottawa, 2018

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Declaration of Committee

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Ethics Statement

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or has conducted the research
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Abstract

Over half of the food produced in Canada is lost or wasted leading to negative environmental impacts and rising levels of food insecurity. The circular food economy (CFE) has been proposed by stakeholders and policymakers as a potential framework to solve the food waste issue through a variety of business and non-profit food-related waste reduction and prevention initiatives. This research asks: How do individuals working in the food sector mobilize CFE practices within their work?; and what are the motivations, opportunities and abilities influencing those working in the CFE sector in Metro Vancouver? To answer these questions, this research analyzed interview data from food sector stakeholders (n=22) who are contributing to the CFE in Metro Vancouver. This study applies the Motivation Opportunity Ability (MOA framework)

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Chapter 1.

waste reduction and circular initiatives. The food system within Metro Vancouver relies on its provincial regulatory contexts but needs a cohesive circular plan for success. This study provides the data that can help align CFE actions and fill the policy gaps with opportunities to reduce and or prevent food waste. Policymakers cannot develop a useful definition of a CFE, let alone devise effective policy, within silos. They must understand what the community is already doing

Chapter 2.

Literature Review

2.1. Circular Economy

2.1.1. What is the Circular Economy?

The CE is an alternative economic model that incorporates resource efficiency, regeneration of natural systems and recycling or recovering materials at the end of their life cycle (Bolger & Doyon, 2019; Mukherjee et al., 2023). It has replaced the take-make-use-dispose system that exists within a linear economy (Bolger & Doyon, 2019; NZWC, 2021) (Figure 1). Morseletto (2020) adds that a CE reduces the use of primary resources and closes the loop of materials within the limits of environmental protection and socioeconomic benefits (see Figure 2). The CE model meets the needs of the growing population within the boundaries of our ecological systems (Smart Prosperity Institute, 2021). The CE transforms resource usage through design, sharing, reuse and innovation within two categories, micro and meso (Kirchherr et al., 2017). Micro CE initiatives exist among products, firms and consumers whereas meso initiatives happen on the city, nation and global scale. Ghisellini et al. (2016) argue that the CE calls for radical alternative design solutions at the intersection between the life cycle process, environment and the economy. More recently, the concept of the CE has received attention from the United Nations (UN) (Mukherjee et al., 2023; Temesgen et al., 2023). Although the phrase “circular economy” is not used within the UN’s Sustainable Development Goals, similar themes have emerged such as the use of resources and reducing waste in Goal 12 - sustainable production and consumption (Temesgen et al., 2021).

Although the CE is open to a variety of interpretations (Morseletto, 2020), Temesgen et al. (2020) argue the CE does not answer the ontological and epistemological questions needed to address the complex environmental, economic and social problems existing in society. This is perhaps because the CE is practice-based, and led by businesses, consultants, policymakers, and political think tanks (Ashton et al., 2022; Temesgen et al., 2021). If the CE had a stronger worldview, ontology, epistemology and axiology, it would create long-term, sustainable changes (Temesgen et al., 2021). For example, through the Chinese's CE promotion Law, China has an overarching approach to CE waste management, which differs from the Canadian, EU and US CE models which are often bottom-up (Ghisellini et al., 2016). China's top-down approach has dissolved any confusion or ambiguity around what constitutes a CE.

There are also a variety of types of CE models. In particular, this diversity arises among business models in different sectors. These sectors include agriculture and food products (where this research is situated), furniture, textile and apparel, electronics, equipment and machinery (Bocken et al., 2019). Mukherjee (2023) explains how the CE can exist among businesses that adopt a variety of structures and contributions to the economy. These include upstream solutions such as value creation, partnerships or collaborations, and downstream solutions such as revenue mechanisms, offerings, valued delivery and products.

2.1.2. Circular Economy in Government and Planning

Although businesses play a large role in CE implementation, governments can play a supportive role through strategic planning (Bolger and Doyon, 2019). Local government planning departments interviewed by Bolger and Doyon (2019) indicate their desire to promote sustainable development in the built environment. However, since there is difficulty defining CE in urban systems, it is challenging for local governments to measure their success in using CE as a tool to reduce waste. Bolger and Doyon (2019) suggest ways that local governments can encourage CE. These include encouraging

adds that CE policy must have specific targets to adopt, such as phasing out the use of virgin materials. However, said targets should differ among consumers, corporations, governments and parks (Morseletto, 2020).

2.1.3. Critiques of the Circular Economy

As the CE aims to advance economic prosperity, ecological integrity and social well-being, Ashton et al. (2022) recognize that in practice, one of these pillars always wins, while another loses. With this, they identify the need for social implications to be better considered in the CE, including how the model impacts human development, the roles of citizens in the labour force and the tensions that arise between grassroots circularity and corporate movements. Ashton et al. (2022) criticize the current approach to this economic model for not addressing social inequalities and power structures that exist within circular practices while also neglecting the aspirations of community members, particularly those who are marginalized. Further, the CE currently does not engage in worldviews or values and can dismiss the real issues they are attempting to address for economic profit (Temesgen et al., 2021). Temesgen et al. (2021) state that CE practices can be implemented for “feel-good” reasons or for greenwashing, further

to the least preferred at the bottom. Although Soma (2022) identifies limitations within this hierarchy, including limiting innovation, lack of consideration of scale, and the lack of distinction between types of food (Soma, 2022). Regardless, food waste prevention is the highest and most important of this hierarchy, followed by using food to feed people, then animals, before recovering nutrients and energy (Varney, 2021). Leaving food for landfill and incineration is the least preferred method.

Figure 3. The food recovery hierarchy, adapted from US EPA (2023) and Papargyropoulou et al. (2014)

Food waste reduction has emerged as a priority on global food policy agendas because of its environmental impact (Evans et al., 2012) and because of its impact on food security. Food waste increases food insecurity (Santeramo, 2021) and exacerbates poverty in developing countries (Vilariño et al., 2017). Reducing food waste can improve world hu11(r)15(b)-11(a)-11(t)das

Mourad (2016) argues the governance structure around food systems needs to be rethought, including the power relationship between producers, manufacturers, retailers, food banks and other actors.

A CFE aims to transform the economy, presenting new, innovative business opportunities. Within this new framework, food would be reused, recycled, recovered and reprocessed (Lungo et al., 2022). Businesses would have the opportunity to redirect food, perhaps giving it to people in need (Leipold et al., 2021). They can take on the responsibility of innovating new ideas of how we can prevent the loss, which could include moving away from empirical food production planning. A CFE leads to new business models, which would create innovative jobs (Lungo et al., 2022) and involve new technological innovations to approach sustainability models (Springle et al., 2022).

Ensuring that diverse stakeholders support a CFE is critical to its success. Coghlan et al. (2022) argue that businesses may be more interested in adopting a circular economy business model without feeling like they are doing something too radical as it p

2.3. Motivation Opportunity Ability (MOA) Framework

The MOA theoretical framework is used throughout this study to analyze data. The MOA framework states that if an individual has these three elements; motivations, opportunities, and abilities, they can change a behaviour (ölander & Thøgersen, 1995). When an individual's motivation, opportunities, and abilities align, they can mobilize these elements to accomplish their goal of supporting pro-environmental behaviour (van Geffen et al., 2020). **Motivation** can be understood as someone's desire, readiness, intention, values or willingness to make the change; **Opportunities** refer to the extent to which preconditions or limitations impact someone's actions to make the change; and **Abilities** are the skills, knowledge, proficiencies and habits available to make the change (MacInnis et al., 1991; ölander & Thøgersen, 1995). Soma et al. (2021b) identify how motivations can go beyond personal interests to include values. For example, if someone wants to reduce their household food waste because they value environmental conservation, they have a high motivation; if they are educated on ways to reduce waste at home such as through meal planning they have a high ability; however, if their refrigerator is set to the wrong temperature, spoiling their food, they have a low opportunity (National Academies of Sciences, Engineering, and Medicine [NASEM], 2020).

Various scholars have adopted the MOA framework to better understand environmental or sustainability behaviours (de Jonge et al., 2014; ölander & Thøgersen, 1995), including reducing food waste (Soma et al., 2021b). De Jonge et al. (2014) and Soma et al. (2021b) both point to the use of nudging in the MOA framework. A nudge can advance one's motivations or ability, but not change structural systemic factors involved in opportunities. However, nudges can support opportunities by learning about what others are doing, enrolling in programming automatically, or increasing the convenience of an opportunity (Soma et al., 2021b). An example of a nudge could be a fridge magnet, reminding you to not waste food. Although this study does not use nudges, it could be considered a viable option for reducing some of the MOA barriers outlined in the Findings (Chapter 4) below. However, the novelty of this paper is that it explores the CFE practice of an emerging group of CFE practitioners using the MOA framework.

From January 2023 to March 2023, 22 semi-structured key informant interviews were conducted with various stakeholders working in the CFE space in Metro Vancouver. It is important to note that several groups declined the interview invitation due to capacity constraints and some organizations noted for their CFE work in the region ceased to exist upon the commencement of this study. Interviews were conducted online via Zoom or over the phone and recorded via a handheld voice recorder for privacy purposes. Each interview was on average 45 minutes. All participants were offered a modest honorarium for their time.

Among the 22 stakeholders interviewed, 10 represent businesses, entrepreneurs or for-profit enterprises, 9 represent non-profit organizations, 2 represent farms and one Indigenous Knowledge Keeper, Leona Brown [who expressed consent and preferred to be fully named]. The sectors of those they represent are shown in Figure 4. Although many stakeholders (10) are in the city of Vancouver, representatives were interviewed from Abbotsford, Burnaby, Delta, Langley, Maple Ridge, North Vancouver, Richmond and Tsawwassen, and three groups operate throughout Metro Vancouver. This distribution is shown in Figure 5. Further details of those interviewed are included in the Findings (Chapter 4).

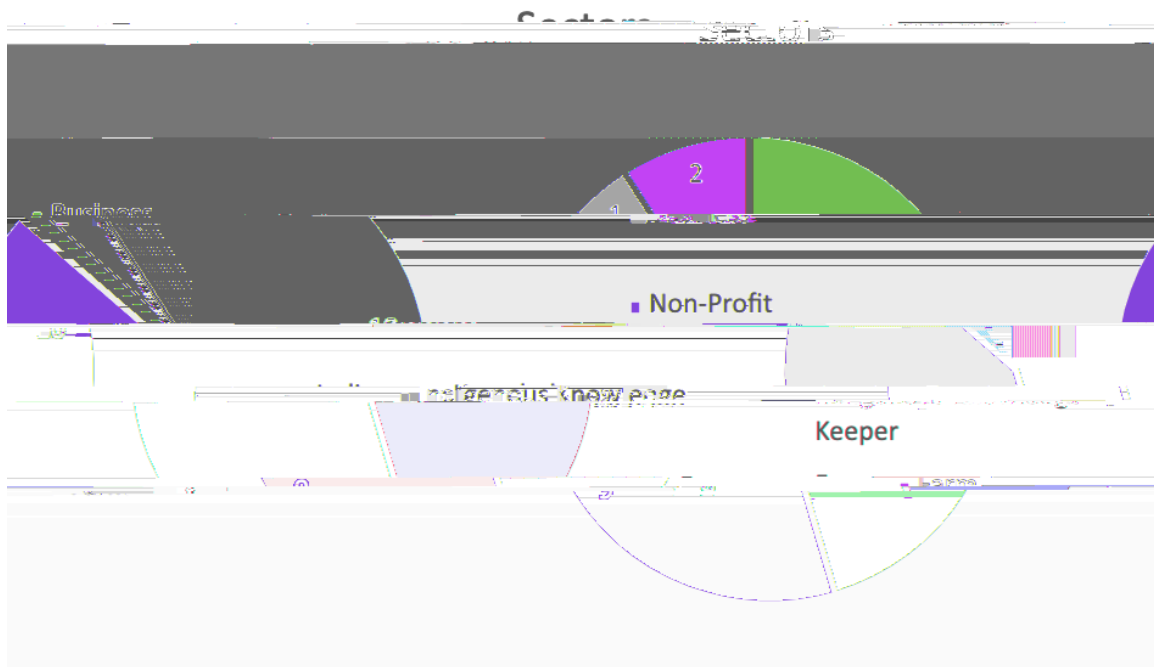


Figure 4. Sector distribution of those interviewed

Figure 5. Location distribution of those interviewed in Metro Vancouver

Interview questions were open-ended, semi-structured and focused on

values in a CFE would be useful in future studies. Further, the participants contacted were not an exhaustive list of CFE initiatives in the region due to personal network limitations, or they were not identified through online searches. Although there were a variety of attempts to diversify the group of those interviewed, this was met with challenges, especially with capacity constraints in smaller initiatives. A major limitation of this study is out of the 22 participants, very few were of minority groups and only one identified themselves as Indigenous. This can be considered a significant limitation of this study. However, the lack of representation of racialized communities in the sustainable food sector may be representative of the variety of barriers to entering into the CFE space and green innovation in Metro Vancouver. Finally, this paper focuses on the MOAs of individual practitioners in the CFE and the broader systematic aspects of CFE is beyond the scope of this paper.

Chapter 4.

regenerative system by not using plastic, feeding pigs with waste, or bringing unsold food “back to the farm to go back into the cycle” (Farm 1).

Figure 6. Overview of circular food economy mobilization practices of those interviewed

4.1.1. Conflicting Landscape and Competing Visions of Circular Food Economy in Metro Vancouver

There was a clear divide between CFE approaches, which at times led to tensions between the approaches. There was frustration among stakeholders who have circularity already built into their operations. For example, one farmer described food waste to be a “hot topic” but felt that small-scale operations are not to be compared to large corporations. This farmer mentioned: “Like Whole Foods, ... or Save On Foods, they have food waste, we don’t have food waste” (Farm 1). This was further questioned by one non-profit when they asked, “Why are we wasting food in the first place?” (Non-profit 10). This questioning of the origins of food waste, and the division between solutions has led to conflicting and competing visions of a CFE in Metro Vancouver.

Participants alluded to the dependency on the charity model in food waste

profit 3). Grocery stores can overproduce cheap bread that smells great to bring people into the grocery store and then dump the inevitable waste onto charities, according to some interviewees (Non-profit 3; Farmer 2). This led one business to question the mission of food charities, who asked if their work is based on social services and societal needs, or a way to let companies producing waste off the hook. Charities are having to pay for companies' (often grocery stores) inability to manage inventories (Business 5). This same business owner noticed the growing focus of food rescue within organizations in the region. They mentioned non-profits focusing on food rescue are the ones receiving much of the grant money which is "setting up infrastructure for all of these other companies to compete against each other. And that's not solving the problem" (Business 5). Further, they alluded to how this approach is reducing the supply of food waste. "These companies that are now starting to be in the upcycling business, they are competing against non-profits, for feedstock, guess what that does? It drives down the supply for these not-for-profits" (Business 5). A non-profit organization also noticed the shrinking supply of food waste due to the growing number of organizations committing to redirecting waste (Non-profit 8). They were disappointed that these initiatives are a lot less grassroots, and with the shrinking supply, the people who need food may find more difficulty in accessing these resources.

This tension has led to the call for collaboration between the for-profit and non-profit sectors. One food rescue non-profit recognized its survival depended on a small operating budget but mentioned if the CFE is going to work, there needs to be revenue from private businesses to support these programs (Non-profit 4). It was mentioned that sharing of data could be one mode of collaboration (Business 2) and perhaps this collaboration would lead to efficiencies within CFE approaches. However, despite this call, a non-profit participant was skeptical of for-profit businesses because of the lack of perceived values entrenched in their approach (Non-profit 8). They stated that there is a range of people doing CFE work for environmental sustainability, however, in the last 5 years, they've seen more approaches entrenched in profit-making.

4.2. Motivations

The motivations of stakeholders working in the CFE in Metro Vancouver can be categorized into four main themes: environmental, social equity and health, economic motivations and integrating values into their work including Indigenous values. These

themes emerged when participants were asked, “Why do this work? What are some of your main motivations?”.

4.2.1. Environmental Motivations

Reducing food waste for environmental and sustainability reasons were the primary motivations of most of the participants. Food waste is a large contributor to greenhouse gas (GHG) emissions, and although GHG emissions can be a divisive issue along political lines, one individual from a food rescue organization indicated that reducing food waste is a “very apolitical way to dramatically cut emissions because it doesn’t matter what side of the political spectrum you’re on, nobody likes food waste” (Non-profit 1). For-profit stakeholders see the need for businesses to behave more responsibly within the food industry where there is a lot of waste. Further, individuals from non-profit and for-profit organizations alike both found personal reasons to contribute to a CFE. For example, an industry leader working in composting indicated:

I've got three kids, and I want them to have a future that is not the way it's going right now. The trajectory we're on right now, if you're paying attention, is scary. And I want to contribute to reversing whatever the hell is going on right now and creating this for the next 15 years so that they have a thriving future (Business 5).

Another participant indicated that contributing to a CFE to protect the environment is a moral responsibility (Business 10). Environmental-related motivations are a common theme among the majority of stakeholders (n=14) who felt proud of being able to contribute to something that supports environmental protection, especially with the growing pressures of climate change in the agri-food system. There was a sense of accomplishment and gratification among those who felt good about contributing to a different type of business practice and challenging the status quo. A variety of stakeholders made it clear that although their efforts were rooted in environmental sustainability, they also recognized that they were motivated by the desire to contribute toward more equity among people as well.

4.2.2. Social Equity and Health Motivations

Interview participants were also motivated by social justice considerations such as solving food insecurity. One non-profit participant identified low income and high

They believe in going above and beyond with their business practices and adding value to their work. Non-profit and for-

distribution (Farmer 2). Canada Helps, a system that streamlines donations administration for non-profits was helpful in operations (Non-

Table 1. Frequency of Barriers Identified

Lack of funding	9
High staff turn over/Reliance on volunteers	7
Limited ability to grow the organization	5

that community events allowed them to learn from experts within the field and learn about what is possible for a CFE. Many stakeholders felt that the relationships they have developed have been critical to their success. This includes the return on networking and getting the word out about programs. Many groups found that connecting with other organizations, sharing resources, and collaborating on ideas have been an effective way to reach goals. Further, stakeholders identified how some of these relationships have turned into either formal or informal mentorship relationships and having that network has helped overcome some of the more technical challenges in their work. One business stated: “We rely on a network of professionals across the food supply chain - in policy, technology, hunger relief, food systems, data analytics, and community development space to help us do what we do” (Business 4).

One clear tension arose between businesses questioning the motives of the non-profit model, or vice versa. Some

profit participant summed up their struggles with the two-tiered food system by questioning their approach to “change the world or keep people alive” (Non-profit 1). This aligns with the Mukherjee et al. (2023) analysis that circular goals need to incorporate both upstream and downstream architecture. This has been a challenge for this non-profit participant who finds it is “really hard to do systems change whilst doing operational stuff” (Non-Profit 1). Despite there being interest in strong sustainability among individuals, the lack of opportunities in CFE initiatives is causing a barrier to enabling systems change.

It seems possible that individuals working in this sector are forced to ignore system solutions because of the extreme pressures to survive within the Metro Vancouver region. The various types of business and non-profit participants included in this study face challenges mobilizing their vision due to the systemic issues accessing resources, land, and infrastructure, at times forcing them to cease operations. This includes the high operational costs included in the findings; high costs of real estate, supplies, food, living and labour. Perhaps to address these system-wide problems the CFE of Metro Vancouver must reassess its vision and foundations, as Temesgen et al. (2021) suggest.

5.3. Identify Pathways, Direction and Vision through Intersectoral and Intergovernmental Collaboration

It is unclear whether the goals of Metro Vancouver’s CFE are to stick with the status quo or create a long-lasting resilient food system. Although there is collaboration in various spaces of the CFE, many initiatives are working in a silo, independently fighting for resources, creating conflicts among their solutions. In addition, some initiatives have neglected the food recovery hierarchy (Soma, 2022) which indicates the importance of reducing waste at the source. Since there is no one pathway, a long-term vision would help support mobilized change. Temesgen et al. (2021) found that when circular initiatives prioritize reuse and rescue, instead of reduction, they do not critically engage with various worldviews and values. Diverse worldviews and values would be seen as a direction for gaining economic profit, further perpetuating the paradox explained above.

abilities of those working in the CFE. This could include collaborative meetings for businesses, non-profits, academics and public sectors to connect, learn and strategize around shared targets. Most importantly, CFE stakeholders in Metro Vancouver must increase education and skills to identify preventing food waste through their initiatives. Strengthen prevention education would support a collective pathway in the CFE.

against each other. This has caused food waste to be commodified. The CFE in Metro Vancouver has moved away from a regenerative, just circular system, and fallen into similar pitfalls that exist within a linear, neoliberal economy. Various initiatives struggle to follow the food recovery hierarchy, which prioritizes reducing food waste at the source, potentially because there is a lack of shared, collective vision among these groups. Strengthening the motivations, opportunities, and abilities of CFE practitioners in Metro Vancouver can help identify a collective pathway. Governments and policy leaders should also direct more efforts to ensure an intergovernmental approach that is collaborative, systemic and just CFE for all.

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Appendix A.

Key Informant Interview Questions

- 1.

Appendix B.

NVivo Coding Tree Diagrams

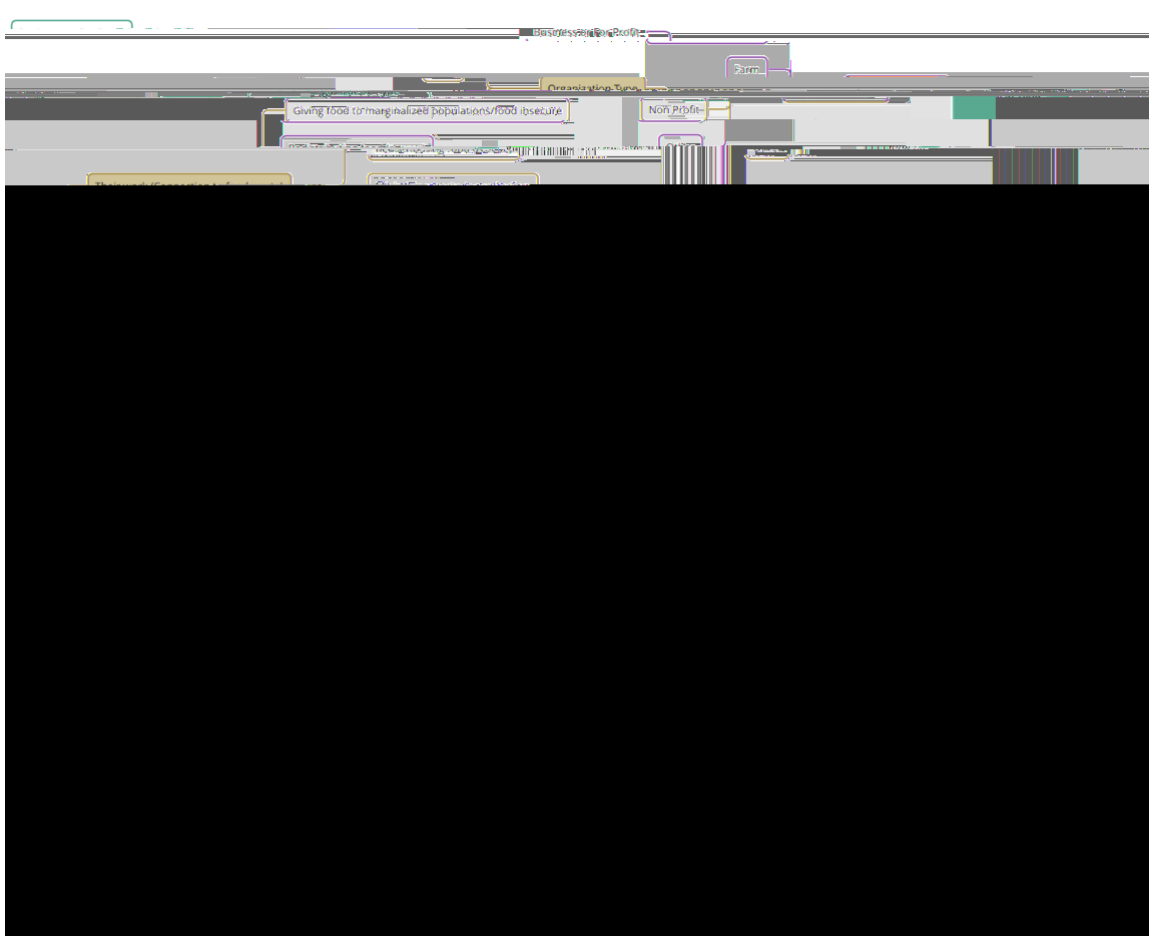


Figure B.1. Coding Tree: Introduction, Motivations and Additional Comments

Figure B.2.

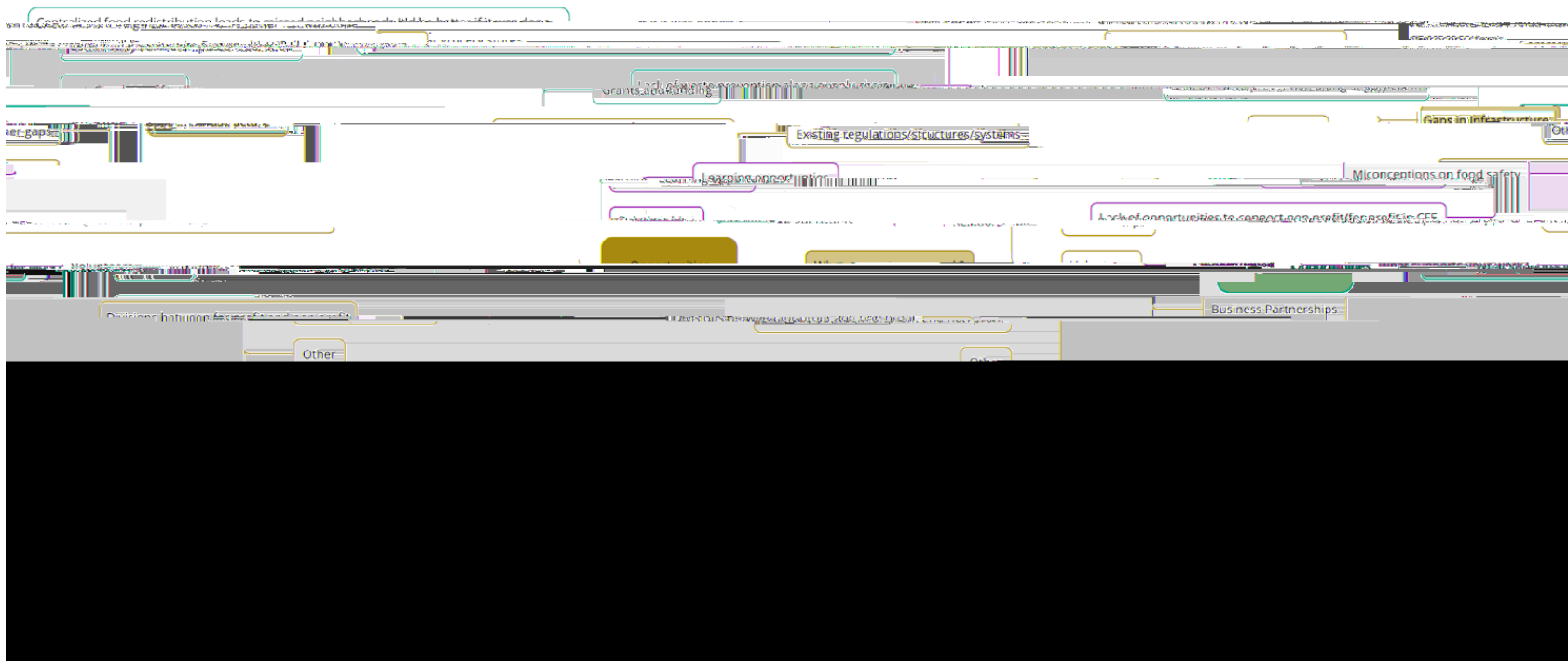


Figure B.4. Coding Trees: Opportunities