Planning for Resilience:
Using Agricultural Cooperatives to Address Food Security in Belize and Canada

by

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Ethics Statement

The author, whose name appears on the title page of this work, has obtained, for the research described in this work, either:

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b) Advance approval of the animal care protocol from the Vancouver Island University Animal Care Committee; or

c) Has conducted this research as a co-investigator, collaborator, or research assistant in a research project approved in advance of the author’s involvement.

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Abstract

Experiencing a steep decline in national food security, Belize must address increased poverty, low levels of systems resiliency, outdated national policies and gender imbalance in order to rectify the food crisis. Using the principles of food security as a guiding framework that informs national policy, Belize can better utilize its state-sanctioned agricultural cooperative system to induce positive, economic and social change. Focusing on the cooperative model for agricultural production has shown demonstrable impacts on poverty reduction and economic wellbeing in neighbouring countries. Using the cooperative as a tool for social change will increase national food security; however, this requires the modernization of agricultural and cooperative policies at the national level that emphasize food security, the role of women and updated standards on cooperative membership. Belize can rectify its crisis and become a stronger economic player, but must first address significant domestic issues affecting its national food security.

Keywords: Agricultural Cooperatives, Agricultural-Management; Belize; Cooperatives; Food-Security; Poverty-Reduction
Dedication

I dedicate this work to my loving husband Dex who has supported me in innumerable ways through all the ups and downs of accomplishing this dissertation. Without him, I would be adrift in this world. His love for me propels me to follow my dreams, and his support of all that I do is without bounds. He has bewitched me body and soul and the adventure that is my life would be meaningless without him. Thank you for loving me, thank you for supporting me, thank you for always being there for me. This dissertation is for you.
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Chapter 1.

1.1 Introduction

Food security and sovereignty are two increasingly important issues in both the developed and developing worlds. While these concepts are certainly issues the world over they are particularly alarming as experienced in Belize. The Food and Agriculture Organization (FAO), a branch of the United Nations, has worked with the government of Belize and recently raised evidence that the nation is experiencing increased food insecurity and loss of sovereignty (FAO, 2017 and SIB, 2017). Working towards rectifying this issue, the government of Belize has, in the past, dedicated significant attention to increasing food security for its nation. Unfortunately, recent administrations have reduced government investment into agriculture and extension services, incapacitating the nation’s ability to positively impact rising levels of national food insecurity (Participant, Personal Communication, 2017). This research argues that through wholesale cross-departmental reorganization and greater investment into agricultural cooperatives, Belize will not only rectify its food crisis but establish itself as a regional stronghold for food export. The benefits of increased food security and sovereignty may provide a strong base from which to propel economic development in Belize, reversing the recent downturn in economic performance (FAO, 2017 and SIB, 2017).

Housed within the Ministry of Agriculture, Belize’s state-sanctioned agricultural cooperatives are a steadfast feature of this Caribbean nation. Agricultural cooperatives are typically established when farmers come together and align under a commonality in a
bottom-up approach, in the case of Belize cooperatives are often born from government incentives aimed at producing a cooperative society. A typical grassroots approach is seen throughout developed and developing nations alike: in Canada, the cooperative movement is one of the defining features in the development of prairie agricultural success, as well as in more recent initiatives in groceries, banking, and retail sales (Goddard, 2002) While the cooperative movement resulted in unified approaches and a corporate approach to benefitting cooperative members, shifts in the Canadian agricultural industry, including rising interests in localism and the return of the small producer, suggests that local and provincial governments in Canada could benefit from achieving a greater understanding of the governance and management structures in Belize as they relate to targeted small-scale, farmer-focused, agricultural cooperatives. This cross-cultural study is also intended to provide benefits to Belize: limited resources Belize’s Department of Cooperatives and shifting government priorities have lessened interest at the national level in supporting agricultural cooperatives. However, opportunity exists in harnessing the passion and capabilities of those within the Department of Cooperatives to enact change informed in part by Canada’s experience with cooperatives. It is hoped that mutual learning will be achieved in this study: Additionally, it is anticipated that the Canadian experience could help to inform new interest in targeted policies and investments that would increase the viability of agricultural cooperatives, achieve greater food security, and alleviate rural poverty in Belize. Re-envisioning Belize’s state-sanctioned agricultural cooperatives will require cross-governmental cooperation that could yield significant results for the entire nation.
1.2 Research Questions

Underpinning this research is a quest to answer a central question: Are agricultural cooperatives a significant, positive factor in increasing food security and resiliency in Belize? Validating the relationship that cooperatives have with food security in Belize is imperative. Without determining the success of this relationship it is difficult to provide rationale for maintaining government support of agricultural cooperatives. Additional sub-questions include:

1) How can agricultural cooperatives increase food security or resiliency in Belize?
2) Can Belize’s food security goals be met through agricultural cooperatives?
3) What are the aspects of Belize’s state-sponsored agricultural cooperatives that are in/ effective? and 
4) Where does potential exist to increase the efficacy of agricultural cooperatives in Belize?

These sub-questions are intended to elicit a narrative that supports or discredits the current approach to cooperatives in Belize. Determining how cooperatives impact food security provides an important understanding of the tangible benefits they have as a model of agricultural production. Providing an analysis of whether agricultural cooperatives can meet the nation’s goals is necessary to generate government support for the findings of this research. Finally, qualitative data around system strengths and weaknesses will illuminate the successes and failures of the current system, providing
targeted insight for the Belizean government to bolster their systems. A secondary benefit will be the use of the information in a Canadian context: it is hypothesized that the results will provide Canadian municipalities with a rationale for developing agricultural cooperatives modelled on the Belize experience.

1.3 Research Rationale and Approach

The conceptual topic of this thesis surrounds the themes of food security, sovereignty and resiliency in Belize. Understanding current and potential implications of Belize’s government-sponsorship of agricultural cooperatives is crucial for achieving an increased state of food security. Re-focusing government attention on already existing tools is important for a developing nation with limited access to capital. Additionally, understanding current strengths and weaknesses creates opportunity for focusing limited resources on programs that potentially have the greatest impact. Academic research provides sufficient evidence that for developing nations the use of agricultural cooperatives and government investment in agriculture yields significant impact on a host of things including increased rate of food security, increased national GDP, poverty alleviation and gender equality. Understanding Belize’s experience with the governance of agricultural cooperatives is equally important insomuch that Canadian municipalities can learn from Belize’s successes and failures when developing their own tools that are approachable and impactful for their agricultural communities, and could prevent municipalities from following similar mistakes in developing their own iterations of government endorsement of agricultural cooperatives. Belize must reorient national
strategies if it is to meet its goals of increasing food security while Canada should look to Belize as a model for agricultural management.

Underpinning this dissertation is a pragmatic worldview. The nature of food security is one in which attention to a single approach or issue fails to capture the scope of reality. The processes that surround food security and systems resiliency must be adaptive to be affective. In conducting this research the primary researcher incorporated pragmatism within the iterative process of research, allowing for a deeper more flexible understanding of the intricate realities facing both Belize and Canada. Perhaps most relevant to planners contemplating agricultural cooperatives is their activation of sustainability goals and the new urbanist ideal of creating complete communities. Food within the modern context often travels great distances creating both an onerous burden on the planet and a society culturally divorced from its food (MacNair, 2004). Agricultural cooperatives accomplish modern planning goals through the establishment of societal connectivity, social resiliency and environmental sustainability (Redwood, 2009) through opportunities to create communities of practice that bring about economic and cultural change. Of increasing concern to the planning profession is how to bring agriculture into the forefront and creating greater connectivity between communities and their food. In doing so, planners are also able to tackle more challenging agendas around reductions in greenhouse gas emissions and environmental sustainability (Redwood, 2009).

Original research data was primarily obtained through semi-structured interviews. Identification of interview candidates initially occurred through government ministry
websites listing employees with responsibilities relating to cooperatives and agriculture. After initial contact was made and an interview conducted, the primary researcher employed the snowball sampling effect, asking interviewees to further identify other individuals who might be relevant to the research. The initial sample of 6 individuals grew to 14 individuals, representing a wide range of backgrounds from members of government ministries and NGOs to farmers. Interview questions as found in Appendix A and B were used as a base from which to work from but did not dictate the entirety of questions asked. As interviewees shared their information new questions were posed to further the understanding of the primary researcher. In doing so this allowed for a more nuanced understanding of a complicated system of organization that got to a more meaningful level than having gone exclusively with the rigidity of standardized questions. While this made for a more complex coding experience it provided a more organic and human understanding of the situation.

1.4 Structure of this Study

This study is structured around the following chapters:

**Chapter 1** introduces the concepts of food security and sovereignty, presents the research questions, and speaks to the rationale for the research.

**Chapter 2** provides a review of contemporary literature surrounding food security and sovereignty. It explores theoretical best practices in the field of agriculture including organic production, inclusion of women and the impacts of cooperative organization.
Chapter 3 details the methods used by the primary researcher in his attempt at answering this study’s primary research questions.

Chapter 4 highlights the results of the semi-structured interviews conducted in Belize as they relate to the primary questions that provided guidance to this research.

Chapter 5 analyses the literature and interviews to generate an understanding of the issues at play in Belize and how to best address them. Parallels are drawn for a Canadian context in an attempt to provide a platform for municipalities to further engage in localized food security and sovereignty measures.

This structure provided the pathway for which this study was conducted and the resulting narrative it produced in its attempt to answer the primary research questions. Under this structure the primary researcher was able to further an understanding of the issues surrounding Belize’s food security and sovereignty and provide a rationale that encourages further development of agricultural cooperatives in both developing and developed nations alike.

1.5 Conclusion

Mentioned before, the audience for this dissertation is the government of Belize and local governments in Canada. It is also intended for anyone interested whether academically or professionally in a system that engages various stakeholders in agricultural production to be active players in the ongoing challenge that is food security and sovereignty. It is hoped that this dissertation helps spark a conversation with Belize’s highest government that goes so far as to recognize the importance that the agricultural
sector plays in its economy and through increased national spending in agriculture the nation’s economy will grow, food security and resiliency will be enhanced and a reversal in poverty trajectories will occur. For consumers of this dissertation in Canadian municipalities and other levels of government, it is hoped that an increase in agricultural investment will occur especially through the establishment and sponsorship of agricultural cooperatives. Agricultural cooperatives are entities that institutions can be confident with because they access groups of people rather than individuals, allowing for governments to more readily engage with agricultural stakeholders. Canada also has a longstanding history of policy implementation that both strengthens and supports agricultural cooperatives, offering a culturally and politically viable option for local governments to engage with the agricultural community directly through governance support and investment. While Belize faces an uncertain future whereby the government has to respond to a significant increase in national poverty and food insecurity, Canadian local governments are feeling similar deleterious effects in rural and agricultural economies. Finding avenues in which to protect and nourish the economy and the people is a parallel concern faced in Belize and Canada. Across the globe governments and organizations are tackling the issue of food security and systems resiliency, this dissertation argues one of the best tools is the development and sponsorship of agricultural cooperatives for their ability to bring together stakeholders and have a significant impact with regards to these issues.
Chapter 2.

Literature Review

2.1 Introduction

From our earliest ancestors some 10,000 to 13,000 years ago who started the modern agricultural food system (Balter, 2007), to the Mayan peoples who once ruled the area (Pomeroy, 1995 and Le Vallee, 2007), to present day, Belize has had a long history of food system development. Today, the food system plays a central role to the growing population of Belize, yet few pay much attention to it. With a population of 380,010 (Belize, 2017), and growing, the demands on the food system are increasing and the nation is shifting to a dependency on imported food (FAO, 2006). The instability and uncertainty of this importation of basic foodstuffs raises additional concerns with quantity and affordability. These are not issues that necessarily have to be faced by the nation as a dependency on imports is not an imperative for Belize: the nation has year round temperatures, adequate soil conditions, and plentiful water sources to allow for continuous agricultural production (Pomeroy, 1995 and Le Vallee, 2007).

Belize is a young nation. Formerly known as British Honduras, Belize achieved its independence from England in 1981 yet remains a member of the Commonwealth. Belize City, located along the northern coast of the nation, was the initial political and financial capital of the country and the seat of the parliamentary system of government until 1971. However, following the destruction caused by Hurricane Hattie in 1961, discussions ensued and a new capital, Belmopan, was created inland approximately a decade later (Pomeroy, 1995). Culturally, Belize is very diverse, boasting a variety of languages and cultures. English is the official language
though Spanish, Creole, Garifuna, Carib and Maya are often spoken. Modern Belize took it start from its colonial past when the British used the nation primarily for its forest reserves. The British left no major infrastructure in place and instead used the major rivers as primary modes of transport. The lack of infrastructure has been a significant factor in the development of the nation, which grapples with the costs and ramifications associated with the development of new roads, community services, and infrastructure for industrial and agricultural uses.

Recent collaboration between the Belizean Government and the Food and Agriculture Organization (FAO), a branch of the United Nations, diagnosed the nation as increasingly insecure with respect to its food systems (World Bank, 2016). Changing consumption and production patterns have increased the reliance of imported food and coinciding with an increase in people living under the poverty line (World Bank, 2016). At a time when Belize’s economy is shrinking and rural poverty increasing, the government has recognized the need for the nation to become food secure. The national goal is to “increase sustainable local agricultural production” (GoB, 2003), and the nation is well suited to achieving this target due to a tropical climate suitable to year round growing and proximity to large international markets. Additionally, Belize can take advantage of its state-sanctioned agricultural cooperative system to address food security and economic growth by empowering farmers and increasing local access to nutritious food.

The task at hand is challenging after decades of funding shortfalls and mixed priorities that have caused damage to the environment and the people. Overhauling the system while investing in infrastructure such as roads and storage facilities could see Belize empower its nation and increase its position as a food exporter rather than an importer. By addressing food
security head on, Belize should be able to better serve its citizens while also achieving economic growth.

This literature review analyzes issues relating to food security, sovereignty, and resilience at both large-scale and small-scale levels. To the former, the link between agriculture and poverty alleviation, the importance of food security, and differing governance structures are examined. To the latter, the structural components to Belize’s state-sponsored agricultural cooperatives are considered in an attempt to highlight the potential it has at increasing Belize’s food security. The discussion below weaves together the large and small scale levels of analysis to best understand the issues relating to food security, sovereignty, and resilience.

2.2 Food Security and Resiliency in Belize

Current trajectories in Belize show a deterioration of quality food systems and resiliency within those systems. At the same time an increasing population is being included in the “food insecurity” category (CSO, 2004). Contradictory, average national food availability is above acceptable minimum dietary intake standards (FAO, 2006), yet high levels of food insecurity persist, and over half of Belize’s population remains vulnerable to food insecurity in many parts of the county (GoB, 2001 and CSO, 2004). These seemingly contradictory trends are best understood under the concept of a food system. A food system includes services such as agricultural production, processing, packaging and distribution of food, preparation and consumption, waste disposal and recycling (Heller and Keoleian, 2003). Figure 1.0 depicts the cyclical nature and interconnectivity of the food system.
Figure 1.0 succinctly visualizes the interconnectivity of a sustainable food system, and the relationship between the various stages from production to waste. The purpose of this figure is to highlight the complexity of the system, and to emphasize that no silver bullet exists to solve the wicked problem of food insecurity in Belize. An approach that targets all aspects of the food system, particularly regarding the supporting infrastructure is in the best interest of Belize.

A key characteristic of cyclical food system design is its sustainability (Hill, 1982). Sustainability is the capacity of the food system to continue a desired condition over time. A food system that is sustainable fosters equitable food production, distribution, consumption, and broader economic development opportunities (Von Braun et al., 1992). For instance, creating an equitable food system involves improving access to land and other natural resources crucial to production, developing access to technology, physical infrastructure, access to markets, labour productivity, and investing in improving food system participants’ education and status, particularly among women (Pinstrup-Anderson et al., 2001). Theories around gender equality and generalized access of the food system have dominated academic literature surrounding food
security and food policy in Belize: the local approach requires that food security explicitly denote goals around gender parity and equal access to national food systems.

The desired process of a sustainable food system is to ensure food security. Defined by the FAO, food security “exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary need and food preferences for an active and healthy life.” (FAO, 1996). Thus, sustainable food systems strive to ensure food security and as represented in Figure 1.0, must encompass all aspects of the system. Longer-term food security generally does not materialize from smooth linear trajectories, but instead arises from adaptive systems that continue to evolve as realities surrounding climate, preferences and access change. To adapt, resiliency theory best describes the way in which a food system can remain sustainable and secure. Walker defines resiliency as the capacity of a system to experience change while retaining the same function, structure, feedbacks and therefore identity (Walker et al., 2006). Resilient systems are a point of weakness for Belize which is increasingly vulnerable to extreme weather events such as hurricanes. Water inundation from hurricane events are particularly debilitating to Belize’s food systems resulting from the loss and destruction of key infrastructural elements within the nation (Pomeroy, 1995 and World Bank, 2016). Belize’s food system is continuously threatened by climatic events, impacting national GDP by as much as 4% per annum (World Bank, 2016). Climate change is expected to exacerbate these weather events, furthering economic hardship and impacting resiliency of Belize’s food systems.

Many ethnic minorities exhibit food insecurity in Belize and with rising childhood obesity rates and food insecurity reaching levels over 55% the cracks in the current system are showing (World Bank, 2016). While obesity may seem the opposite of food insecurity, it reflects
a selection of cheap and unhealthful food, which counters the definition of food security as defined by access to “healthful” food choices. Further abetting increasing insecurity are high transportation costs, low storage capacity and high post-harvest loses which affect both food access and food markets (Le Vallee, 2007). Le Vallee suggests “achieving long term food security in Belize through enhanced resilience and integration of social cohesion into the food system… a more proficient food and nutrition security policy [is required].”(Le Valle, 2007 p. 211). Le Vallee is speaking directly to the fundamentals of resiliency theory and sustainable food systems. Le Vallee further suggests a dual system approach, one oriented on modern high-value export crops other than traditional sugar, citrus and banana which currently dominates Belize’s export markets and one oriented on a localized traditional-led system aimed at nurturing the nation. This approach is particularly interesting in theory because it strengthens the capacity of the local system to focus on inward needs rather than international pressures, whilst the dual market-centric system can specialize in export crops and bring in much needed foreign capital into the country.

Reporting conducted in 2006 by the FAO determined Belize to be self-sufficient in beans, rice and maize but increasingly cheap imports from Mexico and Guatemala threaten the ability of smallholders to compete (FAO, 2006). While the staples of the Belizean diet were well taken care of, the issue regarding an influx in foreign produced foods begs the question around the role of the government in controlling the food system. National strategies aimed at increasing the viability of the agriculture must be stressed. Fortunately the Belizean government has a unique tool at its disposal in the form of a state-sanctioned agricultural cooperative system, which arose following World War II.
2.3 Cooperative Agriculture

Beginning in England in 1844, the cooperative movement has asserted itself as one of the largest socioeconomic movements in the world. The Rochdale Pioneers, a group of flannel weavers, opened the first cooperative store in England to provide themselves with fair access to markets (Pomeroy, 1995). The fundamental ideas behind the development of Rochdale were aimed at equality, fairness and to provide a common marketing outlet for members. While these principles were developed over 150 years ago, they remain largely unchanged in the modern cooperative movement. Six principles of cooperation came out of Rochdale and that underpin the entire movement: Open and voluntary membership, no discrimination against any persons on any basis, democratic control, limited interest on shares, return of surplus to members and cooperative education (Pomeroy, 1995).

Cooperatives continue to show their worth, particularly in Belize. Cooperatives have increased access to wealth generation by counteracting poverty through the collective action of pooling resources to manage identified community needs. Increased membership and rural wealth has increased in Belize since the 1950’s and offers an attractive opportunity for new entrants into the market (Le Vallee, 2007). “With its unique principles of democratic ownership, collective effort and wealth accumulation, the cooperative model has offered attractive avenues for skills development, employment creation, income redistribution rural development, import substitution and foreign exchange earnings at relatively low cost to government” (Le Vallee, 2007 p. 122). Cooperatives have been instrumental in the development of Belize and continue to prove their flexibility with users needs.
Perhaps the most interesting result of the cooperative movement within Belize has been the “enduring capacity to penetrate the widest cross-section of Belizean society and ethnic communities by providing needed services” (Le Valle, 2007 p. 126). Additionally, the cooperative movement has provided meaningful empowerment and employment, particularly of the rural population. As of 2007, Le Valle notes fifteen registered credit unions and twenty-eight producer or consumer cooperatives throughout Belize. Cooperative membership is in excess of 69,000, nearly 20% of the population. Additionally, nearly 2,000 small businesses are members of agricultural, fishing and honey-producing cooperatives, marking the importance and integration of cooperatives into Belizean life (Le Vallee, 2007). Something occurred between the mid thousands and the mid teens that saw significant decline in the quantity and quality of registered cooperatives. In 2014 the number of active members in a cooperative dropped to 2,909 members and only 38 were agricultural or agricultural processing. These numbers dropped again in 2016 with a further membership drop down to 2,769 members and only 30 registered agricultural or agricultural processing cooperatives (DOC, 2016). This loss in both membership and registered cooperatives is troubling given the increasing rate of poverty and food insecurity during this time frame.

Beginning in the 1950s, cooperatives were used as a tool to alleviate rural poverty, provide education and to disseminate technologies into the agricultural sector. Cooperatives were initiated by the Ministry of Agriculture and Cooperatives and were intended to create a “grass roots” feel whereby people helped themselves while the government provided funding and technology. Grass roots style cooperatives are a popular method of state-sanctioned cooperative which place responsibility on cooperative members to self-organize and stimulate economic
development, especially for a nation that does not have the necessary funds or people power to manage something more complex (Pomeroy, 1995). As Pomeroy mentions on page 119, “most cooperative ventures in Belize are not overly successful due primarily to an inadequate government cooperative department and inconsistent marketing policy, which has contributed to the loss of food self sufficiency in rural areas.” While great opportunity and success exists within the cooperative model, the experience in Belize has been not overly successful.

### 2.3.1 Cooperatives in Canada

Agricultural cooperatives and cooperatives in general have been in Canada since the 19th Century (Goddard, 2002). Fashioned after initial successes back in England, the first cooperative was a store in Stellarton, Nova Scotia in 1861 (CD, 2017). Growth in cooperatives accelerated in the 20th Century both out of a need for greater self determination and social and cultural movements that swept over North America centred around the access to goods and better market pricing for agricultural societies across an expanding rural population. This growth was seen predominantly in traditional cooperative purchasing societies in rural Canada (think consumer goods), and agricultural purchasing and selling groups. These early cooperatives provided a way for communities to increase access to goods and sourcing better pricing for agricultural input and output. Some of the earliest and most successful cooperatives in the early 20th Century were farmers’ marketing and purchasing societies, as noted by Goddard, “…from the beginning two major types of cooperative existed to serve the agricultural sector: marketing cooperatives, who purchase, process and sell farm product… and supply cooperatives, who provide product to their consumer (farmer) members” (2002 p. 473). Today there are over 9000
cooperatives in Canada (including credit unions) with approximately 18 million members. World-wide, over 750,000 cooperatives are recognized around the globe: the historic impact of cooperatives is significant, yet cooperatives are often overlooked as a business model (CD, 2017). Consumer research conducted in Canada found that 83% of Canadian consumers would prefer to purchase from cooperatives over private business, suggesting a strong cultural tie to cooperatives in the nation (CD, 2017). With over 1,200 agricultural cooperatives in Canada controlling 15-20% of production, agricultural cooperatives are a mainstay in the Canadian agricultural pantheon (CD, 2017).

What role, if any, do local governments play in the support of agricultural cooperatives in the Canadian context? Is there an ability for municipalities to work in tandem with agricultural cooperatives to reach higher levels of food security, greenhouse gas reduction and employment? According to Rhodes (1985), the traditional rational for public policies aimed at supporting agricultural cooperatives came out of a need to address market failures. In addition, Canadian policy has often provided agricultural cooperatives with friendly legal frameworks, beneficial tax treatment and technical assistance, so the concept of public policies aimed at supporting agricultural cooperatives is one well established in the Canadian context (Iliopoulos, 2013). The ability of local governments to address the role of cooperatives at first glance appears limited. Much of the literature in this field does not directly address this relationship. For example, Iliopoulos (2013) surmises that similar issues face all policy makers. He suggests that policy makers consider the following five questions when determining whether to support agricultural cooperatives.
1. Does the cooperative operate as a user-owned, user-controlled, and user-benefitted business organization?

2. Do adopted policies, such as defined membership, represent attempts to gain excessive market power or are they a consequence of technical or marketing constraints?

3. Does the cooperative produce quasi-public goods and contribute to economic development?

4. Does the cooperative correct a market failure?

5. Would the cooperative be able to correct for market failures, provide a missing service or contribute to local economic development had it adopted the traditional cooperative structure?

While these questions are perhaps appropriate for the goals of correcting for mass-marketed commodity production like wheat and canola, they are not as easily scalable to the local government level. Perhaps the questions could be augmented to look something more akin to the following:

1. Does the cooperative help address the local governments goals towards increasing local food security?

2. Does the cooperative benefit the local government through economic development in the form of increased employment opportunities within the community?

3. Would the products being produced be marketed in the local economy, and would those products be available to persons the most at risk of food insecurity?

Shifting traditional cooperative policy from its focus on market correction towards attaining food security and rural employment goals is an increasingly viable opportunity for Canadian local governments. Restructuring the intention towards achieving greater levels of food security through existent policy tools suggests great potential in increasing the security and sovereignty
of Canada’s food system. Already in use at the federal and provincial levels, there are opportunities for local governments to address regional food security concerns through activation and policy support of agricultural cooperatives. How will or even should local governments use agricultural cooperatives to achieve a reduction in food insecurity is up to them, but there is a history in Canada of using policy that supports cooperatives: updating the approach to reflect the modern needs of a community is not a significant stretch.

2.4 A Regional Context for Policy in Belize

In the post World War II world, agriculture was often regarded in many developing countries as subordinate or inferior to urban and industrial development. Viewed as a necessary component to development, it was largely neglected as an inferior and unsightly industry (Van Keulen, et al., 1998). Waning importance associated with agriculture in developing nations during the postwar era further added to the misconception that the agricultural industry was trivial if not subservient to the needs of industrial development. Unfortunately many developing nations mistakenly allowed the declining importance of the agricultural sector to influence national policy and focused on improving other industries at agriculture’s expense. Skimming surpluses from the agricultural industry and failure to implement supportive policies and innovative development in the agricultural industry resulted in mass neglect, unfavourable internal trade and lead into the modern expression of food insecurity for many developing nations across the world (Van Keulen, et al., 1998).

The neglect of agriculture in terms of incentives during the early stages of development can be a costly mistake, retarding the growth of other sectors as well. Although the rate of expansion of agricultural output is usually lower than for most other economic activities, a rapid increase in productivity is required in order to improve rural incomes and maintain
the food supply for the urban population, the raw materials supply for agro-industrial
development, and cash crop production for export earnings and taxes. These contributions
of agriculture to economic development ask for the definition of a policy framework that
offers appropriate incentives to farmers to improve productivity in a sustainable manner,
while reducing past demand on public expenditures and restoring the foreign exchange

Van Keylen et al., highlight the negative effects of ignoring the agricultural sector in
developing nations. Belize, like many Latin nations in the postwar era, focused on developing
export oriented and industrial operations at the expense of national interest. The result of such
outward focus has resulted in an under developed national food strategy that lacks resiliency
against extreme weather events and market instabilities. Unknowingly, these earlier pursuits of
non agricultural industrial development has forced Belize to reduce its economic prospects while
it addresses basic food needs of the nation. Belize continues to lack any significant publicly
funded infrastructure from roads to storage facilities for its agricultural sector. Unfortunately this
is all to common, and as J. Stiglitz points out, “the importance of physical infrastructure and
institutional factors for agricultural production, which is overwhelmingly characterized by
private decision-making” (Stiglitz, 1987 p. 48). Having allowed multinational corporations to
focus on banana, cane and citrus crops, limited investment has occurred with respect to food
destined for Belize’s national market, resulting in an increasing reliance on foreign imported
foods instead (FAO, 2006).

2.5 Policy Approaches

Agricultural and rural development objectives can be achieved through a variety of policy
instruments readily available to the government of Belize. “Imposing them directly on the farm
level … from trade instruments and exchange rates to production subsidies and procurement
strategies and broader national positions such as price guarantees and publicly funded
infrastructure can achieve greater levels of food security and agricultural production” (Colman
and Young, 1989 p. 269). Belize is well position to enact influential policy interventions directly
on farmers through its state-sponsored agricultural cooperative initiative. Having direct access to
the farmers through the cooperative system Belize’s government has the ability to not only repair
food insecurity, but reinstate the nation’s ability to be a regional exporter for the Latin, Caribbean
and international marketplace, bringing in much needed foreign capital.

Theoretical reasons for state intervention include such market failures as imperfect competition,
public goods (infrastructure, technological innovations), externalities (pollution, erosion, common
property), high transaction costs and imperfect information. The latter two imperfections play an
important role in explaining agrarian institutions that try to cope with market failures to supply
credit, insurance, management and supervision. Among the interventions to serve ‘non-economic’
goals, improvements in the distribution of income (including poverty reduction), sustainability in
resource use and food security prevail. Government's role is severely constrained, however, by
information, implementation and motivation failures, especially in many “developing countries”
administrations (Van Keulen, et al., 1998 p. 297)

Le Vallee once again highlights the issues facing agrarian reform in Latin countries,
including Belize. Attempting to elicit increased agricultural output, the Belizean government
attempted state interventions that ultimately severely underperformed, furthering a lack of
interest in public investment into the very things that would realize benefits to national food
security and agricultural production, namely infrastructure surrounding transportation, storage
and markets (Pomeroy, 1995). “Rather than sectoral policies, exchange rate, trade and tariff
policies have been the major determinants of agricultural prices. Protection of the industrial
sector has raised the prices of inputs used in agricultural production and of consumer goods. Regulation of agricultural markets, taxation and currency overvaluation have led to low prices for farm products” (Van Keulen, et al., 1997 p. 300). What Van Keulen et al., are talking about is the negative impact that industry-first policies have had on the agricultural sector in Latin America. Industrial protectionism left Belize and many of its neighbouring states in situations that today plague economic development as the region must shift its focus towards basic nutrition requirements for its citizens. Economic development failed to create resilience for Belize.

Investment in infrastructure, particularly around transportation, communication and storage have been shown to positively impact food security and resiliency of food systems in the developing world (Antle, 1983 and Binswanger and Kandler, 1993), demonstrate how investment in transportation, communication and storage infrastructure have positive effects on agricultural productivity and “healthier” commodity markets. The knockoff effects of an economic system that emphasizes agricultural infrastructure are increased national food security and greater resiliency of the food system. Research conducted in the late 1980’s suggested that public investment into agricultural research prompted further agricultural growth (Hayami and Ruttan, 1985). Additional investment through the creation and implementation of policy also plays a critical role in developing nations and their relationship between food security and systems resiliency. Le Vallee’s research suggests that without policies aimed at reducing transaction costs for access to markets and information supply that the response and intensity of inputs will remain low. This further supports the academic belief that practices aimed at alleviating food security through rural empowerment and food production are in the best interest
of the Belizean government and that public funding of infrastructure is of great importance.

2.6 Economic Approaches

Strong linkages exist between empowerment of rural peoples incomes and food security (Norton, 1992). Rural welfare can be best served through an improved nutritional status of rural populations; the resulting higher incomes provide increased resiliency of the system that would otherwise continue its decline. “Higher rural incomes are a major condition for improved nutritional conditions, provided basic staple foods are sufficiently available. With land fully utilized, higher production can only be realized through productivity increases per hectare, i.e. higher yields and an economically more attractive crop mix.” (Norton, 1992 p. 61). In favour of the urban centres and for the nation as a whole, rural farmers need realized economic benefit to their work to meaningfully engage them with the task of increasing national food security. Without economic benefit through higher income, incentives to help address the issue of food security and systems resiliency are unlikely to take hold. Combined efforts on behalf of governments in developing nations aimed at increased public spending on agricultural infrastructure increase the ability of rural farmers to control their incomes. Economic self determination plays a vital role in a nation’s quest for greater food security through the empowerment of its rural peoples (Norton, 1992).

The following list from Norton (1992) was identified as the main areas which agricultural policy is aimed with respect to increasing agricultural output.

(i) Area expansion (extensification)

(ii) Increased input use (intensification)
(iii) Technological change (input substitution)

(iv) Crop choice adjustment (output substitution).

With respect to Belize, all four of these output goals can be incorporated through integrative policies. With only 7% of the landbase under agricultural production (out of a nation with 38% of its land base categorically arable), the opportunity to address food insecurity is great (World Bank, 2016). Important to consider would be the ecological impact of any such practices that increased productivity brings and the ability of further investment to promote sustainable practices. The following section of this literature review focuses on the benefits of organic agriculture, a method of production that is readily available to rural farmers who may not be able to afford expensive modern inputs. The benefits of adopting and promoting organic agriculture is the ease of access to rural farmers, and reduced impact upon the natural environment as a result of agricultural runoffs.

2.7 Organic Agriculture

As Belize’s farmers answer the government’s call to “increase sustainable local agricultural production”, consideration towards production methods become important. While indigenous and traditional methods of production in Belize may be appropriate, there is considerable pressure to adopt new technologies from irrigation and mechanization to genetically modified crops and synthetic chemical controls (Scialabba, 2000). While production through indigenous and traditional subsistence methods may be the most culturally appropriate, the reality of a growing population may require a more aggressive, modern approach to farming in order to keep up with demand. The Belizean government has in the past used the cooperatives as
a tool for technological dissemination in the farming community, but in doing so, may have actually increased the risk of food insecurity (LeVallee, 2007). Transnational corporations such as Monsanto actively encourage governments and agricultural ministries to adopt new genetically modified crops that have been engineered to meet the climatic characteristics of a nation. While the sale of the concept is seductive, the reality that plays out in agricultural communities can be devastating. Not only do crop production levels typically fail to meet highly suggestive production targets achieved on trial farms, the farmers themselves become entrapped in a vicious cycle of impoverishment and indentured servitude to pay off crippling debts associated with the adoption of the required new technologies associated with genetically engineered crops including seed, fertilizer and pesticide requirements (Plewis, 2014). Nations need to look no further than the United States or India where Monsanto and other agro-engineering companies have caused entrapment of farmers into their expensive systems, forcing bankruptcy onto tens of thousands of farmers. India in particular has been hit hard by Monsanto’s aggressive monopolization of the seed industry, and tens of thousands of farmers have committed suicide in their fields, not having the ability to pay their bills all in the name of increased agricultural productivity (Plewis, 2014).

Opportunities already exist that allow the farmers of Belize to meet increasing food needs without harming the environment to do so. Organic production methods allow farmers to produce food without relying on debilitating expenses that come with genetically modified foods, at the same time as preventing irreversible harm to the planet (Scialabba, 2000). While there exists a range of standards overseeing organic production methods, at its base level, organic
farming is production without the use of chemical inputs (Scialaba, 2000). Akinyemi and Ebrary provide a more elegant definition, it goes:

Organic farming is essentially an agricultural management practice that avoids usage of pesticides, fertilizers produced synthetically, livestock feed addict etc. Organic farming is characterized by the use of crop rotation, mulch materials and composting materials. The foundation of organic agriculture lies in the health of soil. (Akinyemi and Ebrary, 2007 p. 24)

Challenges do exist with certified organic agricultural production. “From an economic point of view these certification schemes will only be accepted if they are beneficial for the producer.” (Parvathi and Waibel, 2013 p. 313). Costs associated with certification standards and some inputs being higher in initial costing must provide a realizable benefit to the farmer. Less than 7% of agricultural land in Latin America is certified organic (Parvathi et al., 2007). However, this represents the one of the largest regions for certified organic production in the world. Interestingly organically produced foods are not part of localized demand in Latin America. In fact, “in most of the developing countries, irrespective of their income status, a local organic market is still in its nascent stage. It is difficult to break into markets where product familiarity plays a substantial role in product value expectations and perceptions.” (Yun & Pysarchik, 2010 p. 402). Challenges to organic agriculture counter the argument that organic production, while its inputs inflict much reduced harm on the environment, people and animals alike, the reduction in yield negates any benefit, as the land required to produce the same amount
of food is greater. Seufert et al., have conducted a meta analysis on this issue, and from their work in 2012 have the following to say:

Numerous reports have emphasized the need for major changes in the global food system: agriculture must meet the twin challenge of feeding a growing population, with rising demand for meat and high-calorie diets, while simultaneously minimizing its global environmental impacts. Organic farming—a system aimed at producing food with minimal harm to ecosystems, animals or humans—is often proposed as a solution. However, critics argue that organic agriculture may have lower yields and would therefore need more land to produce the same amount of food as conventional farms, resulting in more widespread deforestation and biodiversity loss, and thus undermining the environmental benefits of organic practices…Our analysis of available data shows that, overall, organic yields are typically lower than conventional yields. But these yield differences are highly contextual…[and] under certain conditions—that is, with good management practices, particular crop types and growing conditions-organic systems can thus nearly match conventional yields, whereas under others it at present cannot. To establish organic agriculture as an important tool in sustainable food production, the factors limiting organic yields need to be more fully understood, alongside assessments of the many social, environmental and economic benefits of organic farming systems. (Seufert, Ramankutty and Foley, 2012 p. 230)

While yield was proven to be less with organic methods over conventional, the net loss in productivity may not be as great as commonly believed given advanced multi-seasonal and mixed management methods that pull yields throughout all seasons (Seufert, Ramankutty and Foley, 2012). It may be important to note that of Belize’s total landmass of 22,963km squared, a total of 827,290 hectares of prime agricultural land exists (Le Vallee, 2007). Agriculture is a significant economic driver in Belize, and with only 7% of land under cultivation (World Bank, 2016), the ability to literally grow the economy is a reality.
2.8 The Role of Women

Women and their contribution in agriculture are often undervalued and unreported around the globe, but in particular the developing world. While their contribution in some aspects and regions are greater in agriculture than men, women, particularly rural women, continue to be more at risk of poverty and food insecurity than men (Prakash, 2003). While great strides have been made in the global fight for gender equality, women in the developing world are experiencing poverty at an increasing rate. Development projects aimed at poverty alleviation of the rural poor tend to view women as benefactors of aid, rather than active participants and are largely left out of the development process yet are the group most likely to have the least access to basic needs like food, education and health (Prakash, 2003).

Defining poverty as a lack of access to sufficient food is insufficient for it includes an individuals level of access to assets, services and markets. Without all these, a woman’s ability to sustainably remove herself from poverty through production and other income-generating activity is unlikely (Prakash, 2003). Rural poverty is directly linked to food insecurity, for access to appropriate foods is directly linked to income which brings with it access to markets.

Importantly, women play a significant role in agricultural production without which, perhaps men would have to increase their working hours or even an overall net reduction in food production. A UN report cited in Prakash’s paper mentions that “Women grow about half of the world’s food, but own hardly any land, have difficulty in obtaining credit and are overlooked by agricultural advisors and projects. In Africa, three-quarters of the agricultural work is done by women while in Asia, Latin America and the Middle-East, women comprise half of the agricultural labour force” (Prakash, 2003 p. 3). With women being the dominant player in
agriculture and rural household food security, it begs the question as to why they are not more often brought into the conversation around development projects.

The type of agricultural activities generally expected of women is highly labour-intensive and the rural women generally do not enjoy the benefits of new technologies. Their wages are generally less because it is assumed that the efficiency of women’s labour is poor compared to that of men. Regarding ownership of land, women do not enjoy equal rights, particularly in the developing countries where most of the production, processing, storage and preparation of food is carried out by the women. These account for 50% of the total labour required for food production.

The impact on women of the modernization of agriculture is both complex and contradictory. Women have often been excluded from agrarian reform and training programmes in new agricultural methods. (Prakash, 2003 p. 3)

What Prakash points out is the historical lack of gender balance in regards to agriculture. While women often play a dominant role in production, they remain with an increased risk of poverty and food insecurity. With such academic awareness regarding the plight of rural women employed in agriculture, it is disconcerting that development organizations and governments in the developing world continuously fail to implement stronger policies and programming that engender greater protection and investment in women employed in agriculture.

2.9 Women and Food Security

Women’s roles in agricultural production and food security are profound, and more so in the developing world. Not only are women in the developing world producing and processing agricultural products, they often are responsible for the trade and marketing of these products.
(Prakash, 2003). Globally, women produce more than half of all the food produced. In the Caribbean, women produce up to 80% of basic foodstuffs while in Asia that number jumps from 50-90% particularly with regard to labour in rice fields. In Latin America, women’s household food gardens are some of the most complicated agricultural systems on the planet, yet are given little attention or support (Prakash, 2003).

Despite their contributions to food security, women tend to be invisible actors in development. All too often, their work is not recorded in statistics or mentioned in reports. As a result, their contribution is poorly understood and often underestimated. These handicaps have contributed to an increasing “faminisation” of poverty. Since the 1970s, the number of women living below the poverty line has increased by 50%, in comparison with 30% for their male counterparts. (Prakash, 2003 p. 5)

Development projects aimed at alleviating poverty, especially in rural communities find greater impact when shifting focus to actively include women as prioritized groups. Backed up through empirical studies, women’s role with regards to food security is not-inconsequential. Often the decider of “domestic work”, the burden of ensuring household food security is often solely the responsibility of women. Re-orienting programs, particularly educational services towards women would have disproportionately more impact than the current emphasis on men has.

By invitation, the FAO hosted an international delegation in 1996 known as the World Food Summit to “reaffirm the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger,” (FAO, 1996 pg. 1). During this summit the international community collectively recognizes the role of women in the food system and committed to the betterment of women in
developing countries through investment and support (FAO, 1996) Under Commitment-I of the World Food Summit Plan of Action agenda, governments committed themselves to:

- On Women that a gender perspective is mainstreamed in all policies;
- Promote women’s full and equal participation in the economy...including secure and equal access to and control over credit, land and water;
- Ensure that institutions provide equal access for women;
- Provide equal gender opportunities for education and training in food production, processing and marketing;
- Tailor extension and technical services to women producers and increase the number of women advisors and agents;
- Improve the collection, dissemination and use of gender-disaggregated data [which distinguishes between males and females];
- Focus research efforts on the division of labour and on income access and control within the household; and
- Gather information on women’s traditional knowledge and skills in agriculture, fisheries, forestry and natural resources management. (FAO, 1996)

These guiding principles offer a systematic approach for governments to renegotiate national agricultural policies to better serve women employed in agriculture. Developing nations are often cash-strapped, so the ability to have their investment programs create the largest impact would then in theory suggest a focus on reorienting agricultural emphasis onto women, who as
mentioned already, account for as much as 80% of the labour force in Caribbean agriculture. It is important to acknowledge that gender equality is not a technicality achievable with the wave of a pen, rather a wholesale commitment on behalf of a government to bring about real and meaningful change. Recognition that levels of wealth do not bring about gender equality, rather, it is a firmness in government commitment that is the catalyst. The following quote from Prakash highlights the importance of bringing about gender balance not just in agriculture, but in all aspects of governance. “In most countries, industrial or developing, women are not yet allowed into the corridors of economic and political power. In exercising real power or decision-making authority, women are a distinct minority throughout the world.” (Prakash, 2003 p. 7)

Women play an essential role in agriculture, increasing the quality of life experienced in rural communities. Unfortunately through gender bias and under reporting their efforts are often misunderstood and uncategorized. As Prakash points out, government programs in the developing world perpetuate the myth of the women as non-agricultural, undermining much needed support of women. Of specific interest to developing nations is the role of women and agricultural extension services. Re-programming agricultural extension services to target women may go a long way at increasing rural welfare and food security. Success has been seen in cases where access to credit, infrastructure and education has been acutely targeted towards women (Prakash, 2003), and that women-oriented programming positively affects rural poverty rates and food security. Extension services are typically targeted towards men, but as mentioned, through the refocusing of already existent tools towards women, disproportionate results occur in the pursuit of greater food security in the developing world.
2.10 Women and Cooperatives

In male-dominated societies where women’s membership in cooperatives is restricted, women-only cooperatives are prolific. In these cooperatives women have a sense of freedom and empowerment in a less restricted setting. While Belize’s cooperatives are certainly male dominated, women’s membership is not restricted; however, their makeup of active cooperative membership is significantly lower (in 2016 only 8.3% of cooperative members were women (DOC, 2016), less in agricultural cooperatives) and the presence of women-only cooperatives in the country suggest a similar result to the findings of Prakash. The following list comes from Prakash who found that “the relationship between women and their cooperatives in the context of gender integration can be summarized as under:

- A cooperative being a social development agency should play an active role in advocating for gender equality;
- Since women have been active in development work, they should play central role in development;
- The cooperative can be a venue to improve women’s social status and economic conditions; and
- Thus cooperatives should promote women’s empowerment by integrating gender concerns and formulating a strategy that would address gender issues. (pg. 10)”

Cooperatives have the ability to play a significant role in rural development and food security. Of particular importance is their ability to be governance tools for general equality, bringing about wholesale change in the fight for gender balance. Globally, the ratio of women to
men in agricultural cooperatives is low, however, studies have shown that women strongly influence their husbands which often are the ones who hold cooperative membership and the impact of women may be greater than documented. Modern day agricultural cooperatives face immense pressure from government funding cuts, domestic and international market economies and global climate change. Cooperatives now have challenges that are manifesting in unique ways and the need to adapt is great. Prakash suggests the following points if agricultural cooperatives are going to reorganize and survive:

- Need to improve professional management skills of those who provide advisory or guidance services to cooperatives and of the managers and some key members of primary level cooperatives;

- Establishment of a marketing intelligence system within the Cooperative Movement to enable the farmer-producers follow market trends and plan their production and marketing strategies;

- Assured supply of farm inputs [quality seeds, chemical fertilizer, farm chemicals, credit and extension services];

- Establishment of business federations through cooperative clusters to undertake primary agro-processing marketing of local products and to cover financial requirements;

- Be aware of quality controls and standardization of farm products to be able to compete effectively in the open market;
- Participate in efforts to conserve natural resources which directly and indirectly, influence farm production and rural employment;
- Need for providing information to the farmers and farmers’ organizations on the implications of restructuring, globalization and WTO agreements.

Prakash’s suggestions for cooperative improvement allow for adaptive processes to take hold. Flexibility within the cooperative movement and in institutional responses are inherently required for successful restructuring to occur. The aforementioned suggestions reaffirm the pragmatic approach required to bring about impactful change in Belize’s agricultural sector if meaningful strides are to be made in the reduction of national food insecurity.

### 2.11 Agricultural Extension

Primarily associated with agriculture and rural development, extension services refers to technical assistance, advisory services, technological transfers or any other educational intervention (FAO, 2003). Recognizing the importance of agricultural extension services, which are auxiliary services that are provided to agricultural practitioners ranging from education to strategic involvement, the FAO in 2003 released a report calling for the retooling of national agricultural extension services especially in the developing world. Out of this report came three primary recommendations in the advancement of rural development and food security. The following list presents the three main recommendations:

1. It is recommended that governments develop a new and expanded policy in favour of agricultural extension and communication for rural development. Within this policy
framework, it is recommended that governments adopt a diversified and pluralistic national strategy to promote agricultural extension and communication for rural development.

2. It is recommended that governments build a platform for dialogue and collaboration with the relevant institutions that comprise the diversity of multi-sectoral agricultural extension service providers that exist in most countries. This recommendation is intended to encourage governments to establish new conditions and find new mechanisms for addressing the problem of food insecurity, especially in the rural sector.

3. It is recommended that governments catalyze institutional change within the public sector, aimed at supporting and promoting the new policy and the determinations instituted by the nationwide platform. (FAO, 2003 pg. 9)

Guiding these recommendations is the desired goal of advancing the livelihoods of rural peoples through rural income generation and food security. Retooling agricultural extension as a service tool to alleviate rural poverty should be the goal of developing nations governments whom would realize impressive returns on investment if national investment was instead focused on providing extension services to women and the rural poor.

2.12 Agricultural Extension, Rural Development and the Food Security Challenge

Rural development will continue to play an important role even as the future will increasingly be focused on the urban environment (FAO, 2003). “The function of extension
services… is to provide the transfer and exchange of practical information. “ (FAO, 2003 pg. 14).

The public sector should not ignore the importance of the rural economy. As experienced in post WWII economic policies in Central America, ignoring rural agricultural development in favour of urban and industrial industries negatively affects the entire economy and in particular the ability of the industrial and urban sector to function and evolve (Van Keulen, et al., 1998).

"...(Al)though the majority of the world's population will live in urban areas by 2030, farming populations will not be much smaller than they are today. For the foreseeable future, therefore, dealing with poverty and hunger in much of the world means confronting the problems that small farmers and their families face in their daily struggle for survival”.

(Diouf, 2001)

Succinctly put by the FAO, “public sector commitment is essential to promote agricultural extension and communication for rural development and food security. A new and expanded vision of the public sector role is overdue with respect to food security, rural development and agricultural extension.” (FAO, 2003 pg. 11). Currently agricultural extension services exist in Belize, however, from continued funding cuts to these programs, national spending on agriculture and rural development in general is echoing post WWII policies (Le Vallee, 2007).

Concerns raised by the FAO around the loss of extension services in many nations makes the Belizean reality of continued budget cuts a major issue yet several studies have shown a relationship between extension services and high returns on investment (Birkhaeuser, Evenson
and Feder 1988; Anderson and Feder 2003). Additionally, FAO data suggests a positive impact on food security and rural poverty alleviation through re-focused extension services. This approach may be more necessary than ever at a time when national interests are not focused on the very issues that cripple the Belizean economy.

Employing a multidisciplinary approach to extension services follows the complex nature of human-agricultural practices. Success of extension services relies upon a host of factors that must work together to provide forward assistance to agricultural practitioners. Food insecure nations must overhaul national policies that would increase agriculture success through access to capital, markets, infrastructure and other government held responsibilities must be aligned for national extension services to be effective at achieving rural development and food security goals. “When systematically and effectively provided, extension is known to enhance social and economic development. Technological change and the knowledge system that underpins it, is a critical factor in development” (World Bank 2003, page 27). Research into the impacts of investment into agricultural research and extension has shown there to be a positive affect on agricultural growth (Anderson and Feder 2003). However, the established trend in developing nations is the chronic underfunding of extension services, affecting their abilities to achieve higher levels of food security and damaging a major pillar of their national economies, disallowing them to keep up with economic and population growth (Gallagher 2002).

Since the 1980s various reforms have occurred in developing nations and their agricultural extension services (Rivera and Alex, 2003). Favoured in Brazil and Mexico has been the devolution of nationally organized extension services into a decentralized state or municipal/district-run approach (Rivera and Qamar, 2003). At this point in time, using a district approach
may not be particularly affective for Belize given its lack of district-governance. Governance in
Belize is heavily concentrated in the capital of Belmopan. While decentralizing would certainly
increase the effectiveness of extension services given the multitude of district issues, the chronic
lack of national funding would need to be addressed. Current research has shown the evolution
of thought around extension services from a provision tool of physical support services to that of
a knowledge sharing and transfer system. (Rivera and Qamar, 2003).

"Agriculture has to meet this change [of a rapidly increasing population], mainly
by increasing production and on land already in use and by avoiding further
encroachment on land that is only marginally suitable for cultivation" (Chapter 4.1).

"The priority must be on maintaining and improving the capacity of the higher
potential agricultural lands to support an expanding population" (Chapter 14.3)

(Earth Summit, 1992)

An unfortunate reality in Latin America and the Caribbean is the prevalence of poverty in
rural regions. At more than 60%, poverty in rural areas is more extreme than experienced by
those living in more urban areas. While it is difficult to diagnose the exact causes of this
dichotomy, the fact remains that poverty is rampant in rural areas (Echeverria, 1998) and in
Belize, is actually growing (World Bank, 2016). One way to reduce this dichotomy and increase
overall national food security is the improvement of extension services. While addressing food
security and rural development through agriculture alone is insufficient to successfully tackle the
issues of food security and rural development, the fact remains that Belize’s agricultural sector
plays a significant role in achieving national food security.
Successful extension programming hinges on the ability of the service to reach the intended audience. Employing communication strategies that work best at reaching rural agricultural communities in the developing world needs to be prioritized when reconfiguring national extension services. Reaching agricultural communities can take several approaches but evidence suggests that radio is the most effective, low-cost medium to reach rural agricultural communities (Rivera and Qamar, 2003). Depending on the situation other methods of communication may be culturally appropriate and effective including “face-to-face exchanges (via demonstration and village meetings); one-way print media (such as, newspapers, newsletters, magazines, journals, posters); one-way telecommunication media (including non-interactive radio, television, satellite, computer, cassette, video and loud-speakers mounted on cars); and two-way media: (telephone, including teleconferencing, and interactive (Internet) computer) (Rivera and Qamar, 2003, pg.33).

2.13 Why are the Poor Food Insecure?

"Global agriculture currently produces ample calories and nutrients to provide all the world's people healthy and productive lives", according to the USAID document (1995). "However, food is not distributed equally to regions, countries, households and individuals.... Improved access to food-through increased agricultural productivity and incomes-is essential to meet the food needs of the world's growing population." (Rivera and Qamar, 2003, pg. 31)

Programs aimed at increasing food security and reducing poverty assist the poor in rural communities, but also encourage the diversification of product creation and the production of surplus to have surplus available to bring to market. Having the ability to bring product to
market generates income, improving the quality of life through access to credit, ability to self-invest in agricultural and non-agricultural ventures and improve nutrition (Rivera and Qamar, 2003). Diagnosing the relationship between food security and poverty necessitates looking into the varying factors at play and their relationships to poverty. Food Insecurity at a basic level can arise from general issues of poor governance and an overall lack of institutional support. It can also be transitory (during times of crisis), seasonal or chronic (occurring with regularity). However, food insecurity is most directly linked to an unequal distribution of both the food and the access to that food across geographic and socioeconomic boundaries (Rivera and Qamar, 2003). While we produce enough food in the world to adequately supply every person with ample food, the poor are still unable to achieve food security. Income is paramount to household food security and developing programming aimed at organizing around poverty alleviation through agricultural extension reform is a feasible and desirable reality.

The ultimate solution to combating hunger and food insecurity at the national, as well as the global level, is to provide undernourished people with opportunities to earn adequate income and to assure an abundant supply of food from either domestic production or imports, or both income generation is essential for improved and sustainable livelihoods. Extension, as already noted, can also serve as an indicator and stimulant to incipient commercial development (FAO 2002).

Succinctly put, “policy needs to take an explicit and realistic view of why particular groups and areas remain marginalized” (Farrington et al. 2002). Extension services are important, combatting issues of access and availability on foodstuffs in domestic and international markets (Orr and Orr 2002). The spillover of the rural poor through domestic output
and the economy in general is an important consideration in the development of food security strategies.

Concentrating extension services and investment on small farmers leads to increased economic output and employment opportunities (Johnson and Kilby 1975; Eicher and Staatz 1984). However, aiming solely for increased production from poor producers in rural communities yield poor returns (Ellis 1998 and 1999; Farrington, Christoplos, Kidd and Beckman 2002; Berdegu and Escobar 2002; and Orr and Orr 2002), so extension services must focus on more than production output, instead, on capacity building of the rural poor.

An effective systems based approach to extension services can significantly raise the status of the poor in rural farming communities, and has the potential to dramatically impact the general incidence of national food security and economic growth. While difficult to isolate, the impact of investment into agriculture often has high returns on investment. Studies have shown typical returns of above 40%, unprecedented in most industries (Birkhaeuser, Evenson and Feder 1988; Anderson and Feder 2003). Essential to agricultural growth and food security in developing countries is investment into agricultural research and extension services. It is through the cooperative model that governments are able to address policy and implementation strategies thorough a system that organizes people and agriculture in an effective and impactful way.

2.14 Access to Information

While initial investment into a renewed national extension program will undoubtedly be costly at first, long range benefits that build critical capacity will undoubtedly have significant future impact. Important to this is access to information. Creating and implementing linkages
between producers and the government, producers with other producers and producers and other actors is needed to ensure capacity building. Making available technical data particularly around domestic and international markets is crucial to the success of a renewed extension service. Producers are in need to market intelligence readily available to the Belizean government, however, currently the information is not effectively disseminated. Through knowledge sharing of best practices and market realities, farmers are better able to identify their role as actors in a nations pursuit of food security. Allowing farmers to be abreast of all pertinent information their actions can be better targeted, resulting in greater impact with regard to programs and policies intended at aiding their efforts. While Belize has a significant amount of available information regarding current market realities, a culture of harbouring information has taken root effectively hiding information that would greatly impact its farmers ability to meaningful impact national food insecurity (Le Vallee, 2007).

2.15 Conclusion

This literature review has comprehensively covered an array of topics in relation to food security in Belize. Academic review of what determines food security and resiliency provides the base structure for addressing the needs of any nation. Without recognizing the characteristics of these realities, one does not know how to recognize and address such a wicked problem as food insecurity. Cooperatives as they relate to Belize and Canada, and the policy approaches that can govern them build upon this foundation and our understanding. Best practices that may be relevant to Belize regarding organic production, the role of women and extension services was also exhaustively explored in relation to their observed impacts on national food security in
developing nations. The next chapter provides the methods used by the primary researcher in conducting a series of semi-structured qualitative interviews in Belize. It is hoped that through this study, the government of Belize will recognize where improvement must occur in order to address some of their most pressing national concerns.

Chapter 3.
Methodology

3.1 Research Design

A mixed-methods approach was used in this research. Mixed-methods allowed flexibility within the research design to access the widest range of information possible on the issues under consideration.

Quantitative data was collected to triangulate the claims made in various reports and to provide background information in support of the qualitative comments obtained from the in-depth interviews. For example, quantitative research over a variety of sources was used to corroborate reports from the FAO that suggests Belize experienced a 10% increase in nation food insecurity resulting from a 10% increase in the population living under the poverty line. These reports followed economic trends that suggested in 1996 30% of the population was categorized as below the poverty line while in 2006 the population living under the poverty line had risen to 40%. Given that the main determinant of household food security is wealth, a 10% increase in the population of Belize living under the poverty line suggests that an increase in food insecurity
has occurred. The collection of quantitative data from a variety of sources was a means of ensuring the accuracy and legitimacy of the claims made in each report and study.

Qualitative data was acquired through culturally appropriate, semi-structured interviews. These interviews were conducted in Belize and included government officials and staff from NGOs operating in the field of agricultural cooperatives. Using quantitative data to construct a narrative of rising food insecurity in Belize in conjunction with qualitative interviews provided an insight into the failures and opportunities of Belize’s agricultural cooperative programming to better react to the national food security crisis.

3.2 Quantitative Data

Rather challenging to get ahold of, quantitative data was obtained by piecing together fragments from various reports and studies. Within the Department of Cooperatives, only a single document containing quantitative data fit for the purposes of this research was made available to the primary researcher. Further fragments were gleaned from various reports produced by international agencies and the published findings of other researchers. While some statistics are available from government publications, the depth of information that might be available in Canada simply could not be located in Belize. Non-governmental agencies such as the UN, FAO, and WHO do provide some statistical information in their reports and studies, but this data is often noted as being at best estimates instead of an accurate reporting on local statistics. The difficulties in obtaining concrete quantitative data raises issues in-country for government officials in Belize, as it can be difficult to obtain an accurate, quantifiable understanding of an issue. Instead, anecdotal descriptions and field observations must suffice.
This is stated not to question the validity and accuracy of the descriptions and observations, but to explain why the methodology employed in this study does not delve deeply into quantitative analysis.

### 3.3 Qualitative Data

The qualitative component of the research was a series of semi-structured interviews. The primary researcher emailed perspective candidates an interview request; those initially contacted were employees of government ministries and sub departments, notably within the Ministry of Agriculture and the Department of Cooperatives. Planners as well as other members of academia from Belize’s two universities (University of Belize and Galen University) were also prioritized for first contact. All emails were obtained online from publicly available sources. From this, a snowball method was used to identify additional interview subjects. Snowballing was a successful method to employ given the high level of connectedness between people in Belize: the nation has a saying that while the rest of the world has six degrees of separation, Belize only has two. This relates to the relatively small population, high identification within cultural groups, and small number of urban centres. Snowballing proved to be effective at identifying additional individuals to bring into the research. Interviewees noted that the sharing of information, both successes and failures, was needed in Belize as it was perceived that many people kept their information somewhat to themselves. Sharing qualitative information was seen as even more important in Belize than might be true in other places, given the lack of available quantitative information or other online resources. A second method considered was “the walk about” where the researcher would walk into village offices and ask if an official was available, either at that
time or at a later scheduled time, for an interview. However, this method was quickly deemed to be ineffective, both by the initial set of interviewees who suggested that this was a culturally inappropriate means of contacting government officials, and by the experiences of the researcher, who found that potential interviewees reacted positively to a referral from a known associate. Having the name of a previous interviewee attached to an email, or more successfully, having gained access to their phone number, allowed the quantity of interviews to grow.

It was anticipated that a snowball method would also be successful in accessing farmers who were members of agricultural cooperatives. In preliminary discussions, it was established that these farmers were often in contact with district officers of the Department of Cooperatives or the chairs of the agricultural cooperative themselves. The farmers lived in far-flung locations that were difficult to access, and often these individuals did not have cell phones or computers to enable remote access to establish contacts and set up interviews. To resolve this, the Department of Cooperatives devised a ride along schedule for the researcher and enabled the researcher to join their officers on visits to several cooperatives in several districts. Overall, this approach (having an introduction by the officer and traveling to the farmer’s location) was intended to create new opportunities for qualitative interviews. Unfortunately, the meetings with farmers never occurred. There was a hesitancy among the Department of Cooperative staff to require that the officers: 1) support the ride-alongs; 2) contact local farmers on behalf of the researcher; 3) arrange interviews; and 4) allow time for the interviews to be conducted in the field. All of these components were necessary to complete the research. Given that, the interviews focused on contacts that could be made by the researcher, and are limited to government and NGO officials.
3.4 Rationale

Use of semi-structured interviews rather than a survey or other more rigorous, rigid interview tools was selected to achieve two considerations. First, the lack of available statistical data on agricultural cooperatives in Belize made it challenging to devise a quantitative survey: it was difficult to define choices or questions that were appropriate and useful without some form of background data. Secondly, it became apparent to the researcher that if this research and dissertation was to meet the goals of assisting the government of Belize, a more thorough, culturally appropriate, and nuanced approach must be taken. Therefore, two sets of questions, rather than a survey instrument, were developed. These two sets of questions recognized the positional knowledge a research subject might have depending on their work within government agencies, NGOs, and farming cooperatives (see Appendix A and B for the lists of questions). The first question list, intended for government officials, produced a narrative regarding organizational and jurisdictional structure of their state-sponsored agricultural cooperatives. Additionally, it provided a critical analysis of the successes and failures of the system in place, offering some insight as to the capacity of the Belizean government to adjust their systems. The second set of interview questions were asked of members of agricultural cooperatives, and were used to ascertain users experience of the system.

As noted previously, the primary researcher was unable to conduct interviews with farmers: this results in the loss of an important perspective from those who might benefit from a cooperative structure. Discerning user experiences through perceived and realized anecdotal information would have offered much to the research. However, in its absence, this research shifted its focus towards an evaluation of the governance structure and its ability to provide
programming that benefitted local farmers and ultimately enhanced food security. Creating an understanding of the strengths and weaknesses of governance structures allows for a greater perceptive awareness of how to incorporate a similar approach in Canada.

3.5 Deductive Approach

The overarching method of reasoning used throughout this research was deductive. Deductive reasoning allowed the primary researcher to test the theory that Belize’s state-sponsored agricultural cooperatives can be used to meet the food security needs of the nation. Use of an inductive approach appeared to encourage false positives, and with such an important topic as food security it was felt irresponsible to falsely claim something that the research simply did not support. Using limited quantitative data obtained from the Department of Cooperatives in Belize, a baseline understanding of food security was developed. Determining the state of food security in Belize and to corroborate the FAO’s recent reports of an increasingly food insecure Belize, the primary researcher gathered data from the Department of Statistics in Belize regarding income levels in the country over a several decades to incorporate into the indicator. This data was used in conjunction with the FAO’s definition of the poverty line, acknowledges an increasing population living under the poverty line in Belize. This increase in the population living in poverty is married with an increase in food insecurity, an issue the Belizean government must directly address.

3.6 Case Study Approach

Belize itself is a country of roughly 380,000 people and is small enough that the entire nation can be used as a case study. Using the whole of Belize as a case study was useful because
it allowed the entire scope of the nation to be accessed which, given the small number of Department of Cooperative staff (thirteen individuals in total), the task was not overly bearing. Additionally, to access enough people to have a sizeable number of interviews the primary researcher had to be geographically flexible particularly due to the lack of communication opportunity with members of agricultural cooperatives. Use of interviews allowed the primary researcher to collect data in a culturally appropriate way. Belizean’s typically hold oral histories in high regard, similar to the First Nations peoples in Canada, and most of the information the primary researcher was seeking quite simply is unavailable in any written format. Other methodologies including the previously noted quantitative survey or observational research were not of interest in this research. Observation research would require large amounts of time in the field, and it was unclear what the research would be observing, how these observations might be structured, and where the researcher might make these observations: it would seem unusual to pop up at an exchange with a government official and a farmer and expect that: 1) they would be discussing agricultural cooperatives; 2) that useful data could be obtained; and 3) that the farmer would not question why a stranger was curiously hanging around. It was initially thought that a survey could have some merit, especially given the ease of coding, but given the cultural preference for face-to-face meetings and discussions, it was quickly determined that a survey would be inappropriate. Again, as noted previously, the lack of background data meant that it would be difficult to develop a survey that would result in a nuanced understanding of the strengths and weaknesses experienced within the cooperative system. The rigid structure of surveys loses the user experience through response to narrowly defined yes, no or scaled answers.
The use of a parallel mixed methods design was employed to ensure ease of analysis of both quantitative and qualitative data and to engage potential respondents in a way that was appropriate and respectful. Demanding that government officials fill out a survey and provide statistical data to “back up their claims” would clearly have been inappropriate from many perspectives. Instead, a personal, low-key approach was employed to best consider the local context and the study area.

3.7 Data Collection

Data was collected in two formats. Quantitative data was obtained from Statistics Belize and other government ministries and reports. Data in this format was brought into Microsoft excel into a standardized data set. From there, the data was analyzed to create sets of indicators that offered a response to the study questions on the level of food insecurity in Belize. It was determined that the FAO and Belizean government have publicly stated that Belize is experiencing significant food insecurity, but supporting documentation for this claim is not available. Interestingly, it appears that the anecdotal comments and local knowledge of government workers have shaped the publication of this statement. With respect to qualitative data gathering through structured interviews, the interviews were digitally recorded and the primary researcher kept detailed notes throughout each session. At the end of each session, the digital recording was transcribed onto a digital word format and combined with notes taken. Each interview was then roughly coded in order to categorize the responses and to better manage the data that was collected. Coding was used to create groupings of responses so themes could be pulled out and commonalities can be observed.
3.8 Data Coding

Coding of the data was done using Microsoft excel. Transcripts of the interviews were initially coded using an open coding system where the primary researcher broke down the data into its components and then compared and categorize the responses. Following the initial open coding process, the data was proposed to undergo axial coding to make further connections within the data extracted from transcripts. However, the small number of interviews made this approach unnecessary, and groupings were arranged around response type (either positive, negative or informative). Finally, conclusions from the coding process were selected and a narrative regarding governance and second hand user experience of the cooperative system was developed.

The data collected was used to tell a narrative aimed at answering the primary question and purpose of this research. The quantitative data objectively determined the status of Belize’s food insecurity and to what degree the nation is experiencing hardship. The qualitative data backed up the quantitative data, telling a story that focused on a lack of funding and limited political willpower to deliver an exceptional national strategy to address food security. This research will be used to determine areas of improvement for the Belizean government and to create a general framework for Canadian governments to take into consideration.

3.9 Ethical Considerations

Ethical approval was applied for and granted by Vancouver Island University to conduct the semi-structured interviews. While there were nominal ethical concerns given the nature of the research in Belize (as is true for any field research involving human subjects), the issue around
undue influence was perhaps most important for the primary researcher. Within Belize there exists differing levels of empowerment relating to nationality (those from developed v. developing nations), levels of education, employment (those holding government or political positions v. other individuals), income (perceived or actual), and ethnicity. Interview subjects also noted real and perceived issues with corruption and fears of “speaking out” due to ramifications that could occur. This empowerment or dis-empowerment of people based on these characteristics may create issue for some individuals who might feel that they could not decline participation in the interview if directed to do so by someone perceived to hold power over them. Additionally, without intent or knowledge of the agricultural cooperative industry in Belize, there may be perceived or real social and employment repercussions for individuals becoming involved with this research and sharing their opinions and experiences. This raises issues for the researcher: while best practices of data management will be used, there exists no anonymity in this study because the primary researcher will always know the identity of each participant and their range of comments. It is also possible that individuals may be seen entering the interview, which may put that individual at risk. To mitigate risk to the greatest extent possible, each individual was informed of their right to not participate, that they could withdraw at any time, and while their participation could not be held anonymous, no comments would be attributed to them without their expressed written consent. This statement was made in recognition of the lack of anonymity of participants and the reality that the primary researcher may unknowingly be entering Belize at a time when there could be significant ramifications for people involved with this (or any) research. While current cultural and academic sources suggest this is not the case, it is always
appropriate for a researcher to portray a high level of caution in the research so as to not inflict harm on any individual.

Chapter 4.

Results and Findings

4.1 General Comments

The purpose of this section is to catalogue the findings obtained through interviews of government and non-government officials. Noticeable through all interviews was a strong commitment to cooperatives as a model of agricultural production, including the belief that cooperatives were of great benefit and potential for Belize. In general, respondents indicated that while cooperatives are currently underutilized and historically poorly managed, significant opportunity lies with this business model to propel the Belizean economy, reduce poverty, and increase food security and sovereignty.

As the research unfolded it became apparent that the primary researcher would be unable to reach users of the agricultural cooperative system. A series of events transpired and the extreme difficulty of having government officials follow through with their verbal commitments made it next to impossible to reach out directly. As is often the case, research methods are amended once the researcher is in the field. To adapt to in situ conditions, the researcher focused on the questions outlined in Section 4.6 to determine the strengths and weaknesses of the governance structure that is behind the agricultural cooperative sector in Belize. The resulting interviews conducted on members of government and various NGOs, provided two core viewpoints on the strengths and weaknesses of agricultural cooperatives as it pertains to
governance and user experience (second hand) of the systems in place. The results discussed in the following sections are a result of these semi-structured interviews. The final section details the results and findings obtained through quantitative analysis.

4.2 Quantitative Data

Secondary research was conducted across a wide range of government and NGO sources to piece together a quantitative profile of food security and the economics of food production in Belize. Overall, the sources suggest that Belize as a nation is experiencing significant food insecurity. As much as 57% of the nation is considered impoverished, and given the relationship between financial means an individual’s ability to be food secure, it would follow that a significant portion of its population is suffering (World Bank, 2016). This could be offset, potentially, by levels of subsistence farming, foraging, or hunting that provided adequate foodstuffs for individuals and household units without needing significant financial investments, but this appears not to be the case for citizens in Belize currently living in challenging economic conditions. Compounding the problem is the issue of extreme poverty. While moderate poverty is classified as $4.65 per day, extreme poverty is classified as $2.74 per day and between 2002-2009 (the last available data on national poverty), those classified as living in extreme poverty jumped from 11% to 16% (World Bank, 2016). The data also showed variation in rates of poverty experienced by those living in larger urban centres with 55% of rural areas under the poverty line compared to 28% in urban areas (World Bank, 2016). Poverty is not evenly spread and can actually be categorized by district and by community: the poorest districts are Corozol and Toledo, which are predominantly rural with no significant urban centres. Rates of poverty
are high in Corozol, as is the rate of change, with poverty increasing from 26% to 56% between 2002 and 2009, and extreme poverty almost tripling from 6% to 21% (World Bank, 2016). Toledo District itself is also in challenging circumstances: while in 2002 extreme poverty was 43% it declined in 2009 to 38%. This change is opposite to national trends which are indicative of growing rates of poverty and extreme poverty (GoB and CDB, 2010). Compounding issues with food security were hurricane and flooding events that occurred during this time period, further highlighting the nation’s vulnerability to weather and climate change. During the late 80s to early 90s Belize’s economy was growing at a phenomenal rate of 10% (World Bank, 2016), but modern growth is below the regional average and given the ending of favourable treatment of sugar cane pricing by the European Union, further decline and stagnation of the Belizean economy is expected to occur (World Bank, 2016). Additionally, Belizean economic growth has flattened since 2003, and is not keeping up with the population growth rate. There are concerns among care agencies that poverty levels may be a greater problem than was true in the past (World Bank, 2016). Belize is particularly challenged by weather-related natural disasters attributing to nearly 4% losses in GDP annually. Addressing weather disasters and the negative impacts of climate change are two important issues facing the nation that must be considered along with other domestic and international economic issues (World Bank, 2016).

Agriculture contributes to 13% of the overall GDP (which in 2014 was US $1.6billion, ranked 172th of 194 countries), and employs 10.2% of the population (CIA, 2017), and accounts for two thirds of all exports (SIB, 2017), but access to financing contributes to the retardation of this industry (World Bank, 2016). Other sectors which provide inputs into the economy include: Tourism which is the single largest industry accounts for 28% of employment and 21% of GDP
and fishing representing roughly an additional 5% (World Bank, 2016). Roughly 90% of manufacturing in Belize, totalling 17% of the GDP is based primarily on agricultural inputs (Le Vallee, 2007).

Specifically on the issue of cooperatives, a recent report provides some insight into the impact of this form of organization on the economy. Cooperatives in 2014 numbered 2,909 members of which 289 or 9.9% were women. Of the 72 enterprises, 38 were agriculture or agricultural processing amounting to 52.8% of the total registered cooperatives in Belize. Cooperatives in 2016 numbered 2,769 members of which 230 or 8.3% were women representing 66 enterprises of which 30 were agriculture or agricultural processing or 45.5% of the total registered cooperatives (DOC, 2016). Major losses in cooperatives were in crops (7), and livestock but growth in honey cooperatives has been seen across the nation, particularly in the rural district of Corozol (DOC, 2016). Of note, 38% of Belize’s land base is classified as arable yet only 7% is utilized for farming. Great opportunity lies in activating a larger percentage of their arable land base (World Bank, 2016).

There exists a significant gender imbalance in the workforce with 80% of males participating and just above 50% of females (World Bank, 2016). This is troubling with a higher than average unemployment rate of 16% experienced by woman suggest a desire to work but a lack of opportunity or even refusal of entry into the workforce (World Bank, 2016).

Crime, particularly homicide is a growing concern in Belize. Between 2000 and 2010 that rate of homicide increased 150 times from 16 to 41 per 100,000 inhabitants, the 6th highest in the world in 2010 (Pierce and Veyrat-Pontent, 2013). This rate is higher than average in the Latin America and Caribbean region. Official data from Belize found the homicide rate in 2012 to
actually be higher at 42.5 per 100,000 with Belize City alone at a staggering 106 per 100,000 making it one of the most dangerous cities in the world (World Bank, 2016).

4.3 Research Questions

Guiding this research were questions around the use of agricultural cooperatives as a tool for addressing food security in Belize. Designed to elicit user responses in the system, the researcher employed a semi-structured format as detailed in Appendices A and B, in a culturally appropriate face to face manner. The following questions were structured to provide insight into the role of cooperatives in increasing food security in Belize. The summary responses to each of the questions is considered, below.

Central Question:

Are agricultural cooperatives significantly impacting food security or resiliency in Belize?

Sub-Questions:

1) How can agricultural cooperatives significantly impact food security or resiliency in Belize?

2) Can Belize’s food security goals be met through agricultural cooperatives?

3) What are the aspects of Belize’s state-sponsored agricultural cooperatives that are in/ effective?

4) Where does potential exist to increase the efficacy of agricultural cooperatives in Belize?
4.3.1 Are agricultural cooperatives significantly impacting food security or resiliency in Belize?

In search of an answer to this question both government and non-government people were interviewed. Those selected played active roles in agricultural cooperatives and their viewpoints were largely similar, with certain aspects around critique of the system depending on the individual’s source of employment. While most respondents felt that agricultural cooperatives were currently not significantly impacting food security or resiliency in Belize, they did believe that the cooperative model offered up a preferred method of production that would facilitate significant impact. In addition, while respondents felt that agricultural cooperatives had a significant role to play in addressing food security and resiliency, the current system was too individualistic and the need for greater resources to provide more services to farmers was needed. One government respondent remarked “depending on the level of resources, human or financial from the government side through to the C’s can trigger either success or failure”, speaking to the current reality wherein cooperatives still require support from the government. Additionally, another government responder stated “We have had modest successes, such as the Valley of Peace, but in Ag, we need much more work. Successful AC’s is unfortunately unsuccessful… They have the potential, there’s no doubt about it.” This speaks to the reality experienced in Belize with difficulties in forming and managing cooperatives at a national level, but also clearly illustrates that there is certainly a recognition that cooperatives could be one of the solutions towards increasing security and resiliency of the food system and the subsequent benefits of poverty reduction and economic growth.
Similar responses were obtained from non-government members, but this group was more critical of the role government played in relation to food security. An excerpt from one interview indicated “Cooperatives have been in decline… they are doing great things but they need more help” –this coming from the head of a major international agency, recognizing the current state of affairs as faltering, but also recognizing the positive potential for Belize.

Interestingly, a private consultant in the agricultural industry stated “If food security is what we want then yes but regarding sovereignty we should ask if they are doing what they want or if they are doing what people want them to do.” This delves into the way that organizations define food security. Is it appropriate to lay a framework that is perhaps not inclusionary of cultural practices or local norms? There is a reality in Belize as one government respondent put it “the real food security is how the people are changing their diets as new imported foods come in. There’s been a cultural change in diet.” Perhaps there is less food insecurity than reported, however, in the face of missing national standards of reporting or available information the work done by international organizations is the best available. This is at odds with what the head of an independent international organization had to say, “food security has been an issue. People say we are food secure, but I don’t think we are. If you look at FS as access to food, 40% or more of the pop of Belize is poor… do they have access to food really? I doubt it.” A lack of available data makes the analysis of this issue difficult, and is a problem that faces both government agencies and individuals alike as they work to address economic, social, and environmental issues in the nation. In addition, the silo-ing of information was identified as an issue. Agencies may collect data and will make use of it internally, but the lack of a national survey/statistical
system and the lack of sharing between agencies and within the government itself impedes national progress.

4.3.2 How can agricultural cooperatives significantly impact food security or resiliency in Belize?

Through the responses came a firm belief on behalf of respondents that agricultural cooperatives have a greater role to play in Belize’s food security challenge. Some respondents reflected upon the power of a cooperative to act as a base for information dissemination. The power of information to create meaningful action was stressed by many, as was the necessity of involving the issue of cooperatives into the national conversation on poverty reduction and food security.

Some respondents felt that a greater understanding of how a cooperative operates (with a focus on the powers of a collective) could add to discussions on attaining national goals. One government respondent stated “the cooperative movement has not been properly understood by the farmers, what it is…that it’s getting together for a purpose.” Speaking to the low level of understanding, the respondent indicated that he strongly believes that agricultural cooperatives have a role to play through unification of people and the consolidation of effort, and these changes will achieve higher levels of food security and resiliency. Additionally, many respondents mentioned the ability of cooperatives to be tools in the efficient provision of services across the nation.

Respondents noted that specifically “how” agricultural cooperatives can impact food security and resiliency is through the reduction of capital requirements of individuals through the
sharing of knowledge and resources which cooperation allows. A respondent from an NGO in the area said “we see the benefits and the potential of AC’s because of all the benefits of bulk purchases, reduction of cost etcetera,” which also leads into what other respondents mentioned which is a greater access to capital since “risk is spread across a group, therefore the financial institutions are more willing to provide capital.” The ability of individuals to have greater access to resources is multiplied through cooperative membership and the benefits have potential to increase food security in the nation through increased viability of a farmer’s business.

4.3.3 Can Belize’s food security goals be met through agricultural cooperatives?

In summation yes, every respondent felt that through rejigging of the status quo to reflect a more food security focus that agricultural cooperatives had the potential to dramatically impact national food security. Many respondents felt that cultural differences between people made it difficult in Belize to produce under a cooperative model but the realizable benefits through reduced capital requirement, increased grant opportunities, economies of scale and increased economic pull are significant and viable benefits that make the cooperative production model particularly attractive in Belize. Cross-cultural issues were succinctly addressed in this response from a government official “Politics and religion plays a lot. If we want to work together we must be of one religion or one political party. There’s a lot of issues around that.” Belize is a multi-cultural nation, and while the national motto states “We are all Belizean” the lived reality for individual groups may not find this to be accurate. However, the cooperative model provides an opportunity for all groups to work together. As previously mentioned, the cooperative model can: reduce capital costs in agricultural participation; open of access to capital and funding;
provide services to farmers through extension services, educational services and financial services; and allow for national food security goals to be furthered by the continuation of dedicated channels funnelling national goals through the cooperative movement. The respondents noted all of these positive elements of cooperatives: at issue is implementing them in a way that fits local norms and cultures.

4.3.4 What are the aspects of Belize’s state-sponsored agricultural cooperatives that are in/effective?

Respondents from both government and non-government agencies felt that the existence of a Department of Cooperatives and the auxiliary governance support and extension services it provides was impactful. What was desired by everyone was to make the Department more effective by increasing the adoption of the agricultural cooperative model to address growing issues around food insecurity. Respondents from the government believed an update of the legislation that governs cooperatives was highly needed, as one government respondent stated “it’s a regulation set in the 1970s I think, and so it needs to be updated.” In reality, the current legislation was drafted in the 1960s while Belize was still a British colony and although three separate attempts to modernize it had been made, Belize’s parliament refused to pass the motions even though as one NGO put it “It (the legislation), has been cited as needing to be modernized, updated and looked at.”

Consecutive administrations have moved the Department of Cooperatives between various ministries with each election; as noted by one respondent, permanently housing it within the Ministry of Agriculture would allow the department to work towards its mandate and deliver a more stable and effective service for agricultural cooperatives. As one government respondent
stated “the Department of Cooperatives is usually under the ministry of Agriculture, they are also changed frequently. That is a limiting factor in that the outreach is either enhanced or reduced depending on which area we go to and our share of the national budget if tracked over the years has been decreasing and our outreach capabilities has been eroding.” Maintaining the Department within a single ministry could provide administrative relief. Also effective has been the provision of initial and ongoing governance services aimed at supporting the structure of the cooperatives. What is particularly ineffective is the narrative around cooperative membership and the services provided. Particularly vocal on the failure of government systems have been the respondents employed with NGOs. One respondent stated, “One of the biggest failures I’ve seen has been inadequate staff, the department officers in the field working… They might get training on the job and in most cases it’s not enough… I’ve been to a few C and what I’ve seen is basically within the C’s shows the absence of a C officer. Either he is not there, or he doesn’t show up or doesn’t know what to do even though there are bylaws. It actually comes down to the regional staff to offer these services but it isn’t being met effectively.”

A common thread throughout most of the criticism advanced at the government’s handling of cooperatives was recognition of the lack of resources currently available to the Department of Agriculture. As the government respondents all stated “we only have 3 of us here at what you would call management level and we have 10 field officers spread across the country.” The ability of the government to provide any level of service, whether amazing or terrible, is a challenge simply due to a lack of staffing and budgeting.
4.3.5 Where does potential exist to increase the efficacy of agricultural cooperatives in Belize?

Respondents felt strongly about this question and suggested a variety of answers. Dominant themes emerged and a specific example was suggested across all respondents time and again. It was heavily suggested from both government and non-government respondents to support a specific agricultural cooperative to extreme success and to use it as a model to showcase the benefits of belonging to a cooperative. Several respondents mentioned the need to bring farmers together to share their experiences, that “nothing has worked better than when you take a group of farmers to see other groups who are successful and working. It gives a different perspective and opens up their way of thinking.” Collaborative processes that engage multiple stakeholders provide real opportunities, and respondents indicated that these should be highlighted. The NGOs also recognized the need for women to be approached through cooperatives. As one NGO respondent mentioned “I know there are a lot of women’s groups and C’s, but I think we need to make a more intentional effort with women. I think they come together not necessarily by intention from us but there has to be more of an effort to bring in women and young women within these villages. Women tend to work for some reason more in the processing of agricultural products rather than production.”

Many thought that by bringing a single cooperative up as a perfect model would be useful at attracting additional farmers interested in belonging to a cooperative model and provide greater incentive for the national government to increase funding towards the provision of services aimed at agricultural cooperatives. As one respondent put it, “There needs to be more
handholding with the C’s. There needs to be more support for a longer amount of time to really enact meaningful change.”

Much was mentioned around creating value added production and focusing on both domestic and export markets to bring greater value to farmers. A government respondent mentioned that “The business plan must have some component of export orientation because Belize is a very small market and that is one of the reasons I think the C’s are not very active, because of the small market in Belize. Once we try to target the export market I think that will be good” and “For example, if they get together to produce tomato and there is a ketchup processing plant, that would be an ideal situation for success.”

What came from this question was a unified list of infrastructure improvements required to increase the capacity of agricultural cooperatives. Mentioned by many was “…access to infrastructure. When I speak about access to infrastructure is the fact that these guys know how to produce, but they might not have access to infrastructure of storage facilities, as is the case with peanuts, onions, beans, corn. They know how to grow it, they know how to harvest it, however they do not have no storage facilities to store that, so that when they harvest, when everyone is harvesting, you know the law of demand and supply.” A respondent from an NGO stated quite simply “There are needs for packing sheds in the AC’s so they can wash, sort, grade and market from there. Next, road transportation and accessibility there.”

Non-government respondents suggested a restructuring of government services to be more streamlined and rigorous in their approach. Significant critique of those employed in the Department of Cooperatives was common from respondents. Many believed that some of the people employed in the Department were ill-suited for the role and ineffective at providing
critical supports to agricultural cooperatives. Further, on both sides a resounding desire for
greater provision of market information to farmers so as to produce greater quantity of needed
products. National education around cooperatives and their role in Belize was felt by many to be
necessary as was greater support of the cooperatives already existing for use as examples of
success to other farmers. As one minister stated “There must be a link with the information that
the ministry has, translated to how the farmer can use that.” As well, another respondent said,
“Looking at improving our data, we are a data-deficient society. Data should inform our decision
making process and we should use adaptive management in everything we do.” Access to data
would allow for greater response in both market success and the achievement of food security
goals.

4.4 Additional Issues

While respondents themselves represented government and non-government voices and
represented a wide cross section of Belizean society (Black, Creole, Garifuna, Mayan and
Mestizo), there were shared perspectives and experiences that are best presented together. These
issues are explored further below:

4.4.1 Land Tenure

“In terms of planning, one of the major issues would be looking at the system that land is
issued.” states one government employee. Issues around land and land tenure were raised by
many of the respondents. Safe and marketable land titles are an issue in Belize with poor record
keeping and policies that do not adequately distribute farmland to farmers. Both government and
non-government respondents noted an issue specific to cooperatives: lands that had been
collectively owned by a cooperative eventually went to only one owner, who effectively stole the
land from the rest without consequence. The issue at play is the inability of the government to act
and enforce title in a nation with spotty record keeping and lack of resources.

4.4.2 Aging farming population

An issue also evolving in Belize is the aging farming population. Statistics as well as
interviews with government agents made mention of an aging population where “if we look at
the major active members of our cooperatives, you look at the age range, it’s very high – 50 to
55.” How does the country move forward with national food security strategies if “there’s a big
gap between 0 and 55. We need legislation and incentives that would bring youths to join AC’s.”

4.4.3 Cultural fragmentation

Mentioned by every respondent was the fragmented cultures of the Belizean peoples.
Strong lines are drawn between ethnic groups. While racial tensions are moderate to low, there
was an expressed division between various ethnic groups working together. This cultural divide
was suggested as a major failure and cause of cooperative distress. Cases of successful
cooperatives were always groups which were comprised of people from a shared ethnic and
cultural background and it was suggested that cooperatives which had a more varied group were
more destined to fail unlike the famed Mennonite community as mentioned by a government
representative “The advantage the Mennonites have is a singular religion and no politics so they
are one community.”
4.4.4 Funding exhaustion

Funding agencies have reached a point of exhaustion amongst themselves attempting to implement successful cooperative ventures and Belizean's themselves finding a level of exhaustion being targeted for new opportunities. It has reached a point where many view NGOs and cooperatives as acts of charity, as one NGO said it has created “a mentality that C’s and funding is seen as charity to get things from.” Rather than developing genuine interest in the business model of cooperation, those involved chose to take advantage of the initial funding benefits and let the cooperative fail after the funding runs out. Longevity of most cooperatives is a concern with most failing after the funding is over.

4.4.5 Taxation

Mentioned mostly by government respondents were concerns over the nation’s taxation structure, particularly around high tariffs on goods critical to agricultural production. One specific example was that of barbed wire. No company in Belize makes barbed wire and the largest user is the agricultural industry, yet Belize places prohibitory tariffs on incoming goods into the country. This prompts a large trade in the black market for many important items as Belize shares a highly porous border with Mexico and Guatemala.

4.4.6 Access to Capital

Access to credit in the form of financing, loans and micro-financing is a struggle for members of cooperatives. While membership in a collective is often viewed favourably upon, the financial institutions of Belize currently are not supplying the agricultural sector with readily
available means of securing financing. Every respondent cited the struggle for agricultural cooperatives to access capital through financial institutions as a major factor in the struggle to create relevance and success with the cooperative movement in Belize.

4.4.7 Education

Respondents made mention of educational needs in to distinct categories. First, a call to action for education reform in the country was noted as a means to correct some of Belize’s national failings, particularly around the economy. As an academic pointed out “It’s all about education. You’d have to look at the statistics and see what is being done to substitute the imports with local stuff.” Second was a call to include cooperative education and training in elementary school curriculum, as part of a focused approach to raising awareness. “Agriculture should be in the schools, back in the primary schools,” a lead officer at an NGO pointed out. All respondents believed that cooperatives were a practical approach to take in Belize given its small size and the need to develop economies of scale and the sharing of infrastructure, however, a lack of proper understanding of the purpose and structure of cooperatives hampers greater adoption of cooperatives as a preferred model of association and production.

4.4.8 Illegal Imports

Already mentioned was the porous nature of the shared borders with Mexico and Guatemala. In addition to illegal imports of goods is the illegal import of foods. Produced cheaper than in Belize, fresh produce from Mexico and Guatemala floods Belizean markets, out-pricing and out-competing locally produced produce and de-incentivizing production. A lack of enforcement at
the borders and in markets has allowed this practice to proliferate at the expense of domestic agriculture. As a high profile minister responded “a very porous border with Mexico where production is cheaper, so there is a flood of contraband products. Everything, not just onions and agricultural products, but everything (floods our markets).”

4.5 Conclusion

Agricultural Cooperatives have many factors working against them, from out of date legislation and lack of adequate assistance to illegal imports. Those working in the industry believe strongly in the ability of agricultural cooperatives to provide solutions to solve the food security crisis, poverty and unemployment crisis, gender disparity, and economic shortcomings of Belize. Greater investment into the cooperative movement is needed at a national level and targeted policies aimed at greater education, capital and infrastructure investment and policy modernization is believed to further advance the agricultural cooperative movement. Belize is well positioned to take greater advantage of agricultural cooperatives to address national goals and to provide greater national food security and sovereignty.

Chapter 5.

Discussion

5.1 Analysis of Key Findings

Belize has much to work on in order to address food insecurity. From a history of colonial neglect to postwar era policies, the lack of agricultural support in this this small nation has continued to negatively affect present day food security. While Belize is rather small and
economically challenged, this does not mean that it is incapable of redefining its food future. Retooling of their agricultural cooperative system is integral to Belize’s restoration as a food secure nation. Reimagining this system to address food security and to build systems that foster resiliency and flexibility will be fundamental in this endeavour. In addition, resiliency in Belize is particularly important given the regularity in extreme weather events, such as hurricanes and flooding. Overall, addressing food insecurity in Belize will ultimately require change. It is hoped that this research will provide some useful direction for the nation, outline some best practices, and provide some potential pathways for addressing food insecurity in Belize..

5.1.1 National Policies

Restructuring at the national level is needed to increase the capacity of the local food systems and to counterbalance negative trajectories associated with food insecurity and low levels of resiliency. Foremost in any discourse around remediation of Belize’s high level of food insecurity is the need to develop a national strategy that champions food security across all government ministries and departments. The Ministry of Agriculture in 2003 released “The National Food & Agriculture Policy 2002-2020” under a slogan “No Farmer = No Food” (MoG, 2003). While this document is comprehensive and lays out a national strategy that takes into consideration much of what the academic literature made note of as seen in Chapter 2, it fails in that food security is not the primary driver for the policy. Placing food security within a broader list of national objectives results in a loss of momentum around resolving the issue of food insecurity. More damaging is that this policy was never ratified, as noted in several interviews of government respondents. It is the understanding of the primary researcher through interviews
with members of government that not ratifying this document has led to individuals within government to pick and chose on which aspects they wish to work. While recognition of food security is surely had by many, higher priority has been placed on economic growth. Within an updated national strategy on agriculture and a national strategy on how to address food insecurity, the ability to work with inter-department staff, local organizations, and international non-government organizations provides an opportunity to address the issue across multiple platforms already in-country. Thus, Belize does not have to rewrite their entire playbook, rather, establish targeted plans that address the issues facing the nation.

5.1.2 Agricultural Cooperatives

Belize should be self sufficient with respect to its food needs and, in fact, should be a regional exporter of foodstuffs to neighbouring countries. Unfortunately, decades of neglect and misunderstanding regarding the importance of the agricultural sector has lead to the crisis unfolding today. Rural and urban populations alike are affected; however, the issues around food insecurity are felt most acutely in rural populations where access to income earning opportunities are limited. Greater focus could be placed on alleviating rural poverty through economic incentives aimed at increased production. Since socio-economic status is a determining factor of access to food, coupled with Belize’s goal to “increase sustainable local agricultural production”, it would follow that the government could help rural farmers access domestic markets under favourable conditions. Restructuring of government involvement in agricultural cooperatives can provide the tool required to address these issues. Supporting the cooperatives should be their greatest priority at a time when food insecurity and loss of resilience within the food system is
plaguing economic development. Combating rising inequality and increasing the nation’s food
security and sovereignty can be immediately bolstered through public funding of the nation’s
cooperatives. Supportive infrastructural is required for policy changes to be particularly
effective, and is explored further in 5.1.3.

Belize’s state-sanctioned cooperatives provide a tool to accomplish the goal of increased
production. Many agricultural producers hold memberships in a cooperative, so the ability of the
government to reach out to individual farmers and groups is readily available. Harnessing this
tool as an educational and incentive opportunity for farming members is additionally important.
However, in place of government control and legislation dictating the needs and actions of the
cooperatives, open discussion amongst the farmers should be fostered. Peer support is cited in
the research and in interviews as an effective tool for farmers to adopt new practices. Several
interviewees made mention of successful programs which brought farmers together to share
knowledge, and found a greater appropriation of techniques. Stating the government’s position
on increased production is important; however, the decision in which to best achieve this goal
should be the prerogative of the producer with the government readily able and willing to
support their farmers. While production methods vary greatly, there is an interesting opportunity
to be had in Belize with respect to organic production methods. Although there is conflicting
research on aspects of organic production methods (Akinyemi & Ebrary, 2007 and Seufert,
Ramankutty, & Foley, 2012), it may provide an opportunity to open the door to new domestic
and international markets that expect the “organic” label on foodstuffs.

State involvement with agricultural cooperatives is uncommon and a unique feature of
Belize. These cooperatives provide an exceptional opportunity for the nation to respond to the
increasing food security crisis. Having such an established tool saves time in creating inroads into farming communities and allows for new technologies and conversations to begin without significant delay. Harnessing those relationships in a meaningful way not only provides an avenue to understand the needs of the farmer, but also delivers and supports those needs in a timely and effective manner. As highlighted in reports provided by the FAO, the last decade has seen Belize’s level of food insecurity rise sharply to over 40% of the population (World Bank, 2016). Perhaps this next decade can see a reversal of that number, and continue until food security and resiliency has been achieved nationwide.

5.1.3 Infrastructure and Technology

Implementing new technologies or crop production methods is unlikely to guarantee success if done without approaching farmers and establishing strong relationships. Instead, the Belizean government should reach out through the cooperative system and start conversations. Investigating farmers needs to achieve higher levels of sustainable production and how they view their role in the fight against food insecurity would be a meaningful start to achieving their goals. While conversations around increasing the productivity of the landscape play a part in a larger national dialogue, the Belizean government must also invest heavily into supportive infrastructure for the agricultural sector. Without adequate cold or dry storage, processing facilities, or even quality transportation networks, any improvements in agricultural production could possibly be nullified.
5.1.3(i) In-Country Infrastructure

Opportunity exists to quickly expand national supportive infrastructure for the agricultural sector in Belize that could significantly help reduce the rate of food insecurity. Through respondents interviews, it became apparent that the government of Belize holds considerable lands across the nation wherein regional offices of ministries and departments operate. These lands have ample room to house storage facilities for agricultural products. A decentralized approach to storage that could act as a regional holding for surpluses could be of significant benefit in a nation with very little storage capacity at present.

Road infrastructure is the main source of transportation in Belize and it is well known in the country that the roads are inadequate and highly dangerous. Belize’s roadways suffer from a lack of enforcement of driving laws, leading to a culture of dangerous driving that results in a high number of fatal accidents. Increasing the safety of the roads begins with addressing the way which people use it. Additionally, within the strategy to increase national food security, the Belizean government must address physical deficiencies in its road networks. Increasing the safety of its road networks while increasing the ability of goods and services to flow freely within Belize builds national capacity with respect to foodstuffs and the ability for all communities to have accesses. In some food security interviews, the issue around a lack of road networks posed a significant threat, in particular to remote and rural communities. In some communities the lack of a paved roadway eliminates vehicle access due to the dirt road being washed away in weather events or the road is so deeply rutted that it becomes impassable. These single-road communities need greater access and proposing a greater paved road network throughout Belize is essential in addressing food security.
5.1.3(ii) Access to Domestic Markets

The need for supportive infrastructure is so great that accessing food is a real challenge in some communities. Perhaps initial conversations should examine the infrastructural needs of the national food system on a localized level. A common theme in the literature cites access to domestic and international markets as a continuous struggle. Removing barriers to market access, such as an improved road network and multi-national agreements, would help Belize achieve its goal. Fortunately, Belize can readdress the errors of its past through implementation of new policies oriented around food security and resiliency of the food system as preferential instead of industrialization. Antle (1983) and Binswanger and Kandler (1993), demonstrate how investment in transportation, communication, and storage infrastructure have positive effects on agricultural productivity and “healthier” commodity markets. Taking advantage of its advanced system of state-sponsored agricultural cooperatives, Belize may remedy national trends of increasing food insecurity with surprising haste. The primary researcher experienced first hand the struggle to purchase healthy, fresh foods while in several communities. The ability of the government to expand local infrastructure may help bring more nutritious foods, and specifically fresh produce, into many communities around Belize.

5.1.3(iii) Access to International Markets

Access to export markets is particularly challenging for the majority of Belize’s population. Congruent to the characteristics of small economies, Belize has one of the highest tariff structures in the world and producer/exporters additionally face uneven and grossly inflated tariff and non tariff barriers to accessing international markets (World Bank, 2016). Reducing the
barriers to the exportation of Belizean goods allows the opportunity for much needed foreign capital and investment to enter Belize. In a developing nation with a small economy, the ability to reach economies of scale is difficult if not impossible. Using investment agreements and foreign currency purchases of Belizean products directly impacts national food security. Remembering that the primary determining factor of household food security is income, the adoption of policies that encourage foreign investment and purchasing of Belizean products increases the market size to which Belizean producers can sell their goods. In turn, this would increase the earning potential for individuals in cooperative societies, thus positively effecting their personal food security.

5.1.3(iv) Organic Agriculture

With reference to the discussion on organic agriculture, Belize could adopt appropriate and modern forms of intensive production in order to capitalize on trends toward organic produce and foodstuffs. This contemporary adaptation has the potential to strengthen the economic benefit to rural farmers, increase systems resilience, and reduce environmental impact. Organic production offers an additional level of production capacity that builds sovereignty, security and resiliency into the food network. For example, organic production would imply a reduction in environmental impact of agricultural production, increase food security, and provide a product that has high export value.

Establishment of localized demand for organic products, as Yun and Pysarchik (2010) suggest, may have to occur simultaneously with significant export production and local education to firmly establish its market presence. While this could provide too big a challenge,
perhaps it could foster a real opportunity for Belize to become a food secure nation through the adoption of environmentally sustainable organic practices. Education of growing methods in addition to national campaigns aimed at educating the general public would be required to create a domestic market for organic foods. There may be little to no desire at this point in time, as organic foods are largely unknown in Belize and simplifying the workload for the Belizean government, which has a limited budget, may need to focus its efforts elsewhere. While using certification of organic production to meet a high value international need, a major challenge remains in establishing a domestic organic market in Belize. However, the economic opportunity to tag onto the growing movement of organic production is regionally appropriate as neighbouring nations take advantage of growing demand from the Global North and supplying their desire for certified organic foods.

The avenue for enacting policy change is already well in place in Belize. The interconnected state-support of agricultural cooperatives provides Belize with a competitive advantage for successful implementation of organic agricultural reform. By creating new policies that apply academic and localized best practices to the global trend of organic products, Belize may be able to significantly increase the success of its agricultural industry so as to increase food security and overall resiliency of the system.

5.1.4 Finding Gender Balance

While women's contribution to food security and agricultural production is undoubtedly valuable and significant, the services geared towards their involvement must receive significant attention if Belize is to effectively improve the status of food security. Given that women only
represent 8% of cooperative memberships, it seems as though government efforts to engage have been more directed towards men, as women are seen to have an unequal impact on national and household food security; however, Belize has real opportunity to engage with this underrepresented gender. Recognition of women’s contribution to national and household food security and agricultural production must occur, and the development of inclusive extension services that openly encourage the participation of women should be mandatory throughout all new language. Women’s role in agriculture must no longer be overlooked, and legislation and practice in the field of food security must ensure that women are actively sought out and brought into conversations and extension services. In Belize’s own experience, women create value-added products that bring greater financial returns to communities than base agricultural products. Targeting women through extension services that offer agricultural production and business development services are in line with current economic realities. Additionally, women make the majority of household food choices and participate in home-gardening which can add significant calories into a household. Organizing and providing training to increase women's impact offers an excellent opportunity to support the incredible work that women do. Belize’s best hope is an all hands on deck approach to tackling food insecurity and reducing the gender gap in the agricultural industry is a proven way to reducing food insecurity, unemployment and poverty (Prakash, 2003).

5.1.5 Extension Services

Belize may see exceptional economic and social benefit through the expansion of agricultural extension services. Such investment would bolster the rural economies that underpin
the urban and industrial sectors of Belize. Extension services are particularly important to invest in because of their direct positive impact on food security, rural development, and poverty alleviation in developing countries (FAO, 2003). As mentioned in Chapter 2, extension services refers to technical assistance, advisory services, technological transfers or any other educational intervention (FAO, 2003). Further development of such services should focus on targeted programming aimed towards women and youth in agriculture primarily around the educational and technological transfer component of extension. Already mentioned is the extent to which women’s role in agriculture is a dominating force yet receives little focus or investment. Youth also present an opportunity for further extension services who will make up the next generation of farmers, a recognized need expressed in the 2002-2020 National Food and Agriculture Policy set out by the Ministry of Agriculture. Targeting youth may serve to develop the next generation of farmers to be more aware of the benefits of both cooperative membership and the role they directly play with regard to national food security. The opportunity to address critical failings with current agricultural practices may be successfully resolved by establishing a dynamic future where Belizean farmers are more educated, empowered and aware of their role in effecting food security by reaching out to youth and attracting them to the agricultural industry.

Recognizing food security as the ultimate public good and focusing efforts across all national programming must be a main priority in modernizing Belize’s national programming. Investment in agriculture, partly through extension services as a means for achieving food security will forever alter the nation; however, this will only be achieved through a concerted effort on behalf of every government agency at play in Belize. Although various NGOs operating in Belize are assisting the government in addressing issues around food security and extension
services, the responsibility lies with government at all levels to carry the torch. The national
government must act as the central catalyst through focusing national energies on to food
security and rural poverty alleviation through rural development.

Viewing extension services within a context of national rural development and food
security goals in Belize can be the purview of the government. In order to be effective, extension
services should coordinate, take stock of all public and private players, and manage services in
such a way that extension is able to grow without being a drain on the economy. While Belize
currently exhibits a high degree of centralization of government services, extension services
could be part of a larger decentralization agenda that coordinates all players to disseminate
knowledge to rural agricultural players. This approach could be particularly powerful in
achieving food security goals in Belize given the number of public and private players in the
agricultural field, including a number of high profile NGO’s. Additionally, a multi-sectoral
approach to agricultural extension services that leverages the various organization operating in
the agricultural field would be beneficial in any attempt to restructure service delivery in Belize.
Since the 1980s, private sector involvement in providing extension services has been rapidly
expanding, thus the ability of Belize’s government to leverage both public and private service
providers should lead to a more successful series of programming. Restructuring of national
policies would certainly work towards greater integration of NGOs already working within
Belize’s systems. In doing so, opening up of information systems across government ministries,
NGOs, farmers, and the public simultaneously with new policies and programs as they are
implemented will see greater implementation success.
5.1.6 Accessing Information

Information is a powerful tool. In the experience of the researcher, gathering quantitative and qualitative information was challenging. In conducting interviews with Department of Cooperatives staff, the withholding of information and access to farmers became a significant barrier. The lack of willingness to assist the primary researcher through the sharing of documents and access to farmers may have been arisen from a need for self preservation. It is speculated that the refusal to facilitate interviews with farming members of the cooperatives may have been due to fear on the part of the department that the farmers might direct significant criticism of department staff and services, harming their careers. This hesitation to share information may have been the reason that the Department officers were not motivated to set up the interviews. Much of the information that informs officers is through qualitative responses to issues as they arise rather than hard quantitative analysis. Working on qualitative notions alone and not a sufficient amount of shared quantitative data is a real issue facing agriculture and cooperatives in Belize. There is a real opportunity for increased efficiency and awareness of national food production and consumption if the government placed more emphasis on retrieving and making public such data. Additionally, in order to garner an understanding of Belize’s current situation, it is necessary to piece together information from various sources. This high level of fragmentation of the information system stalls progressive governance and societal impact. Opening up information channels and making readily available data easy to access is necessary to generating significant impact with any work towards reducing national food insecurity.
5.1.7 Respondents’ Suggestions for Systemic, National Level Changes

The respondents provided a range of suggestions that could be implemented at a national level: The following summarizes these proposed changes:

- Updating of the legislation governing cooperatives (the legislation has not been updated since its creation prior to Belize gaining independence)
- Investment in infrastructure including roads, packing and storage sheds and processing facilities
- Release of data across agencies and departments. Making what is known available so as to reduce overlap, work together and provide citizens with meaningful information
- An increase in staffing dedicated to assisting agricultural cooperatives succeed
- Create educational programming at all levels K-University that expand national understanding of cooperatives
- Remove corruption and replace affected department staff with educated and engaged persons
- Modernization of national taxation and tariff systems. Reducing the taxation and tariffs on agricultural inputs (like barbed wire, fertilizer, etc.)
- Increase access to capital for cooperatives
- Implement a national agriculture strategy (the current one hasn’t been ratified)
- Create opportunities for farmers to engage among peers both nationally and with neighbouring countries where agricultural cooperatives are highly successful
Many more suggestions were made that are contained in the other sections explored in this chapter. This list represents some of the commonly desired attributes that respondents felt were needed in Belize.

5.1.8 Summary

Through the provision of market information as part of an overall extension services plan will become a critical component to the success of establishing a more resilient food system in Belize. Starting with addressing rural poverty and further empowering farmers through their state-sponsored cooperative system will be a start to the march towards national food security.

With such a tool as the established cooperative system in Belize, addressing the food security issues can become the work of the entire nation instead of a closely held secret in government. Harnessing tens of thousands of active members, their talents, and their productivity in national conversations around food security will achieve unbelievable heights for a nation with few resources. Empowering the people to take food security into their own hands, while offering support through the strengthening of access to domestic and foreign markets, and providing complementary infrastructure projects that ensures sufficient food storage and transportation will result in the proper steps to combat the food security crisis. Propelling itself to better feed its people, Belize’s efforts will likely be rewarded with great economic development, further increasing the wealth of the nation and the resiliency of its food systems.
5.1.9 How These Results Can Inform Policy and Practice

One purpose of this study is to promote conversations both in Belize regarding strengthening government's commitment to agricultural cooperative by working alongside the farmers, as well as in Canada surrounding the expansion of the cooperative model to increase our own food security. For Belize, recommitting to the existing framework is desirable as the agricultural cooperative infrastructure is already in place. This would allow the country to save time in implementing an alternate system, which is important as the threat of food security continues to grow. Additionally, development of a national focus toward increasing national food security, sovereignty and resiliency would likely have far reaching impacts for the entire nation at a time when Belize’s economy needs are in the forefront of government priorities. Local governments across Canada should view this study as a case to adopt similar structures in their jurisdictions. With aging farmers, an unstable climate, and access to agricultural lands and inputs more difficult than ever before, the ability of cooperative models to restore resiliency of the agricultural sector is profound and perhaps even necessary.

5.1.9(i) In Belize

This study should be viewed by Belizean officials not as a challenge to their systems, but as outside perspective and interpretation for possible enhancements on preexisting method. Through national and third party statistics, we know that Belize is facing a crisis. With food insecurity and poverty is rising, what will the Belizean government do to help their nation overcome these challenges? Addressing these issues can be effectively accomplished by way of strengthening the preexisting agricultural cooperative movement.
Perhaps most important is the suggestion to create a national strategy to tackle the problems around food insecurity. By dedicating resources and effort towards eradicating this growing problem, Belize will notice benefits throughout many facets of their nation and economy. In order to reap such rewards, it is necessary to create a national agriculture strategy that encourages and supports cooperatives, reduces unnecessary tariffs that harm the industry, and negates the impact of porous borders with illegal goods.

This study also provides the Belizean government with an overview to the challenges facing their systems, such as the outdated and colonial legislation that governs cooperatives in the first place. The recommendations of this paper, from targeting women members to exploring value added systems, are achievable goals that have the potential to greatly improve their country's position. Interagency cooperation, with strategies specifically in the realm of food security, can really shape Belize into a food secure nation. This study highlights best practices that Belize can readily incorporate, and through the help of inter-governmental agencies and NGO’s, Belize can surely achieve a high level of success if the right people in government champion this movement and recognize the potential power that cooperatives could have on the nation.

5.1.9(ii) In Canada

With respect to Canada, this study provides an overview of an agricultural system that may fit nicely into a municipality’s arsenal in addressing food security. Cities across Canada are now looking at developing food security plans, but are unsure where to begin. Important for Canadian planners to know is that food security is a major issue in Canada that must be
addressed. In the North where food insecurity is at its most severe, with nearly half of the population being food insecure. Nunavut is the hardest hit at 46.8% and the Northwest Territories reaching 24.1% (Tarasuk, Mitchell and Dachner, 2016). More typically, 12% of Canadian households are food insecure, a third of which are children under 18 (Tarasuk, Mitchell and Dachner, 2016). Recent collated food bank data shows a 28% increase in users accessing food banks nationwide since 2008, this alarming trend is tied to an increasingly volatile housing market and can be addressed through municipal agricultural programs and the use of cooperatives (FoodBank, 2016).

The literature review found in Chapter 3 shows the history of cooperatives in Canada and their ability to impact rural economies, employment, and food security. In today’s increasingly unreliable climate, perhaps the time has come for local governments to become more engaged with the food system as part of an ever increasing measure to maintain the viability of their constituents economically, environmentally and healthfully. Local governments have resources at their disposal far greater than the nation of Belize. Activating agricultural policies that incorporate and mandate cooperative business models allows for the sharing of resources and the ability of regional agricultural sectors to feed into the system. In turn, this will create employment opportunities, reduce the capital cost of modern agriculture, and foster a culture of togetherness.

In the example of Belize, the Department of Cooperatives is structured around a senior management team of three with ten field officers delivering training and support. Within a Canadian context wherein farmers have significant access to educational and support through governments as well as the private industry, the need for a large a sub-department is not
necessary. Opportunity lies in having a small but dedicated team within the planning department to coordinate auxiliary services targeted at establishing and supporting agricultural cooperatives. Using agricultural cooperatives allows local governments to benefit a large group of farmers while targeting localize priorities such as increased production, job creation, increased food sovereignty and reductions in food insecurity. The City of Victoria has a single food system planner on the planning team overseeing and coordinating agricultural activities in the city. This is a perfect example of a dedicated individual programming a local government’s response to agriculture and it can be replicated in every municipality. What is stressed in this thesis is that opportunity exists for dedicated planners to activate their food security and agricultural plans through the use of agricultural cooperatives. Cooperatives as argued, have proven their ability to positively impact communities food security, economy and cultural realities and offer Canadian local governments an opportunity to greatly impact their community while supporting the greatest number of farmers possible.

5.2 Contribution to Knowledge

This study brings a cross-sectional look at the inter-workings and best practices of agricultural cooperatives as it relates to Belize. Access to information in Belize is critically inefficient. The provision of a generalized overview of the structure and the potential for the nation’s cooperative movement to significantly impact food security is a missing component in the academic and professional literature. Perhaps intended to be consumable by a more general public, this study hopes to bring greater understanding of the ability of cooperatives to ratify change in Belize.
Struggling economically with growing rates of poverty, unemployment, and food insecurity, Belize is facing a crisis and this study provides recommendations to help promote change. With many different strategies in which Belize can choose to tackle these challenges, one that already has infrastructure in place and operates across the nation is that of the Department of Cooperatives. By studying the impact of this department, conducting research on its effects nationally, and including the best practices industry wide, this study confidently provides a broad overview that is largely missing.

The recommendations suggested by this study provide the platform on which positive changes can start in Belize, a nation that needs to respond to growing issues that may soon be insurmountable. When discussing the potential impact this study could have on Canadian agriculture, these recommendations and strategies should serve as a rough guide or interest piece in the pursuit of activating food security. Local agricultural policies aimed at localizing the system may become vital for the Canadian agriculture that is increasingly at risk through climate change and macro economics.

5.3 Further Research Questions and Methods

This research is only part of a larger narrative around food security, sovereignty, and resiliency for Belize. While a mixed methods look into the efficacy and operations of agricultural cooperatives in Belize is important, it only represents a small surface of an extensive problem. Further research should delve into what directly ails the system and analyze response to new programming to determine how best to move forward. Specific questions that should be looked at include:
- What incentives would increase participation in agricultural cooperatives?
- What policies or programs work best with regards to establishing agricultural cooperatives?
- What supports do agricultural cooperatives need from the Belizean government in order to have greater impact?
- If not the cooperative model, is there another opportunity to engage farmers through a share-type program which reduces capital requirements and creates buying/selling power?

Delving further into the issue via these questions would create a deeper understanding of prior policies and programs and how they have impacted cooperatives. Ultimately, agricultural cooperatives provide an opportunity to impact food security, rural poverty, and gender dichotomies in a country strife with social and economic issues; however, the model must be supported at the government level if it is to play a significant role in the nation. Further research into understanding this industry as it relates to Belize, food security, and empowerment of people is integral to achieving a brighter future for the citizens of Belize.

It is possible that if given adequate time, resources, and government support, a researcher could set up a new cooperative or work with a preexisting network and trial new concepts and supports. This case study could directly document the impacts of individual programs and supports to determine the greatest return on investment and the parameters that create the greatest impact on a cooperative. This level of investment of time and resources into truly testing alternatives until finding a successful mix of supports could truly have a great impact on Belize’s agricultural cooperatives and their impact on restoring food security to the nation.
5.5 Weaknesses and Limitations of This Study

Within all studies there exist certain limitations that impede or reduce the ability of a researcher to capture their subject in its entirety. Several major limitations occurred while conducting this study and are discussed further in the following sub-sections. The biggest limitation of this study is the lack of user perspective. While every attempt was made to connect with members of agricultural cooperatives, Departmental operatives may have intervened and made that nearly impossible (further explored in 5.5.2). This missing voice in the study is a key factor in understanding how the intentions of the Department of Cooperatives are experienced and perceived by the users of the system, namely the cooperative farmers. Without their voices and critiques, it is impossible to ascertain a complete picture how to improve the system. Ultimately, without the farmer's perspectives this study only covers governance and third party experiences in relation to the cooperatives. This lost perspective would have made this research more impactful and meaningful to both the nation of Belize and the intended Canadian consumers of this study who may be looking at what constitutes best practices.

5.5.1 Access to Information

Information is not readily available in Belize, which posed a significant hurdle to overcome. In preparation for the study, preliminary research for information specific to Belize and the agricultural cooperatives was exceptionally challenging as it was often dated or fragmented. While conduction primary research in-country, this theme continued as. Piecing together segments of reports across various agencies and governments was the only way to gain a sense of what was occurring in Belize. During several interviews, respondents made mention of
the withholding of available information in the country. It appears that there is good data available, but the government ministries and agencies do not openly share their findings. This lack of sharing both inter-departmentally and with the public is a real travesty. The Belizean government has made the effort to research and understand the various situations facing Belize as a nation, but the lack of communication causes any progress to become a drawn out and arduous process.

By happenstance, the primary researcher made a surprise visit to a regional Department of Cooperatives office and was fortunate enough to meet with an officer who was passionate about research and agricultural cooperatives. This individual provided great insight into the workings of the industry and provided a pivotal document that identified some of the missing data needed to complete this study. While this chance encounter proved important, it was disheartening since this information was without a doubt available at the head office where the researcher had spent several days interviewing several ministers and officers. In fact, this exact document was mentioned by several individuals, but due to a lack of willingness and openness the document was never shared.

5.5.2 Refusal to Cooperate

One of the largest limitations to this study was the lack of cooperation on behalf of government agents in-country. The original intention of this research was to gain an understanding on the effectiveness of the country's agricultural cooperatives. By meeting with government, non-government, and business leaders operating amongst agricultural cooperatives, the data obtained in those interviews could then be compared with first hand experience through
interviews with farmers and members of the cooperatives. Originally, the Department of Cooperatives seemed willing to do help with the research by organizing a series of ride-along’s with Department officers in order to conduct interviews to cooperative members. Without this assistance it would be nearly impossible to contact or visit the agricultural cooperatives which are widely dispersed and without readily available contact. While the ride-along’s were scheduled, Department officers foiled any attempt made to actually join them through a series of diversions including termination of my attendance, changing dates and times, and simply ignoring my requests. While all attempts were made by the researcher to be as available and flexible as possible, it became apparent that I was not actually welcome by the Department of Cooperatives to actually go and interview members of the agricultural cooperatives that they are tasked to oversee. This missing component to the research hampers a stronger understanding of the disparity between governance measures and actual user experiences. Without this understanding it becomes difficult to dissect the industry and to determine what is working well and what is not. It is possible that impeding the direct interview with the members of the cooperatives was an act of self-preservation, as one Department officer stated during his interview “corruption is an issue”.

5.5.3 Dangerous Settings

As aforementioned, Belize ranks high on the international scale (6th), for homicide. This reality plays out poorly in the national sense with 99% of children bearing witness to violent crime in their lives. Recent years have seen crime in general, particularly around gang and drug related offences, on a steep rise. Pressure from America, through increased demands on opiates,
has seen regions of Central America plunged into crisis and Belize is no exception.

Conducting research in a violent country poses significant problems, namely having safety and security. As well, violent places make conducting research precarious and may leave researchers with a need to escape prior to finishing their studies. The unfortunate reality is that dangerous places are often in need of researchers to come in and understand what is occurring. In this study, the main focus was to examine the strengths and the shortcomings of the agricultural cooperatives in Belize and how they impact the nation's food security. Unfortunately, the research was interrupted and a missing component around user experience was lost because it was unsafe to continue residing and conducting research in Belize.

5.6 Conclusion

This study provides a brief overview of how agricultural cooperatives operate and the potential they have at impacting food security levels, particularly in rural communities. While the reality of conducting research in a developing nation with high levels of violence hampered the ability to conduct comprehensive research, real implications around improving the agricultural cooperative system through a refocusing of efforts and inclusionary practices may arise from this work. Belize as a nation is young and through their continued self-discovery have the ability to navigate their future with a flexibility unavailable to more established nations. Typical of developing worlds, food insecurity is rampant and in Belize’s case, growing. Belize has the advantage of being able to use preexisting tools and infrastructure, and by continuing to work with international and regional agencies, real change can positively impact every one of its citizens. Employment of a national strategy to address food security will have demonstrative
effects that impact the nation for generations. Failure to act on the growing crisis will only serve to further challenge the development of the nation.

While Belize is certainly suffering, they have the means to rectify and rewrite its future. Refocusing on the fundamental requirement of food security will transform this Caribbean nation into a regional example of good food policy and governance. The path towards greater food security is hard, mired in intricate governance, policy, and human realities, but it is attainable. Belize can attain food security for all of its citizens, but it will take the entire nation and a dedicated government and ministry staff in coordination with the private and non-governmental sector, but most importantly the farmers to see it through.
References.


Food and Agriculture Organization (2002). FAO papers on selected issues relating to the WTO negotiation on agriculture. Commodities and Trade Division. Rome.


Appendices.

Appendix A:

1) Are you currently a member of an agricultural cooperative?
   a. Yes
   b. No
   c. And why?

2) What benefits or disadvantages do you believe come from being involved with agricultural cooperatives?
   a. Benefits:
   b. Disadvantages:

3) Do you think agricultural cooperatives are the most effective method of agricultural production?
   a. If yes, please explain why
   b. If not, what method of production do you think is more effective?

4) What support does the Ministry of Cooperatives/Agriculture provide to members of agricultural cooperatives?
   a. Is there another support that the Ministry could provide to increase the success of cooperatives?
   b. Have you been able to produce more food under cooperative membership?

5) Do you think you will remain a member of an agricultural cooperative?
   a. Yes
   b. No
   c. And why?

6) If you are currently not a member, do you plan on joining an agricultural cooperative? (perhaps bump up to top)
   a. Yes
   b. No
   c. And Why?

7) Do you feel that cooperatives help increase food security?

8) What do you think the future of food security and agriculture in Belize looks like?
Appendix B:

1. How familiar are you with agricultural cooperatives in Belize?
   a. Very Familiar
   b. Somewhat Familiar
   c. Somewhat Unfamiliar
   d. Not Familiar at all

2. Please describe the agricultural cooperatives you are aware of in Belize.
   a. Location
   b. Size (number of members, amount of production)
   c. How long it has operated
   d. Status (growing, unchanged, shrinking)

3. Are there regulations in Belize that apply to agricultural cooperatives?
   a. Yes
   b. No
   c. If “Yes” where are they located and how are they shared with the public

4. How are these regulations applied by elected officials/planners/key staff in Belize?

5. What informal techniques (that is, non-legislated) have been used for agricultural cooperatives in Belize, particularly in small communities?

6. From the perspective of elected officials and individuals employed in planning-related positions, what are the barriers to increasing the viability or adoption of agricultural cooperatives?

7. What amendments would you recommend to the current legislation?
   a. If Yes, what level of government do you suggest or do you feel that informal techniques is the preferred approach?

8. Do you believe that Agricultural Cooperatives are a successful method of producing food in Belize?
   a. Perhaps is there a particular area where they are more successful?
   b. Perhaps is there a different form of agricultural production that you believe to be preferred or effective?

9. What has been the biggest success of implementing agricultural cooperatives in Belize?
10. What is the biggest challenge of implementing agricultural cooperatives in Belize?

11. How do you think Agricultural Cooperatives could be promoted further in Belize?

12. How can this research be used to assist in discussions at a national level on amendments to agricultural best practices?

13. Are the state-sponsored agricultural cooperatives successful at increasing production?
   a. Are they offered enough support to do so?
   b. What are the limitations of the current system to achieve “increased sustainable local agricultural production”

14. Would you prefer that agriculture was no longer managed under state-sponsored agricultural cooperatives?
   a. Why?
   b. If yes, what system would you prefer?

15. What are your thoughts on the future of food security and agriculture in Belize?
   a. What does it look like?
   b. Where is it going?
   c. What role will cooperatives play?