NATIONAL FOOD SECURITY IN CUBA: BY WHAT MEANS?

by

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ABSTRACT

Using data retrieved from the FAO's food database (FAOSTAT), food security is calculated in Cuba as the annual average recommended daily dietary needs (RDDNs) consumed from imported and domestically grown foods. Domestically grown foods are further differentiated as culturally appropriate foods (CAFs), which are "traditional crops grown in traditional ways for domestic consumption" (USDA, 2008, 42), and non-CAFs. The level of RDDNs consumed from CAFs is used as a measure of food sovereignty. Time series of annual average consumption of RDDNs from imported foods, domestically grown CAFs, and domestically grown non-CAFs are overlaid on a chronology of food policy networks to demonstrate if food sovereignty can serve as an alternative to institutionalised agriculture and food systems for achieving food security, and what form of power-sharing relationships can be effective for achieving food sovereignty in Cuba.

LIST OF ABBREVIATIONS USED

ANAP	Asociación Nacional de Agricultores Pequeños / National Association of Small Farmers
ANPP	la Asamblea Nacional del Poder Popular / the National Assembly of People's Power
CAF	Culturally appropriate food
CCS	Cooperativas de Créditos y Servicios / Cooperatives of Credit and Services
CPA	Cooperativa de Producción Agropecuaria / Agricultural Production Cooperative
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO's food database
FCL	FAOSTAT Commodity List
GNAU	Grupo Nacional de Agricultura Urbana/ National Group for Urban Agriculture
LVC	La Via Campesina
MACAC	Movimiento Agroecológico de Campesino a Campesino / Farmer to Farmer Agroecology Movement
*n*PE	*new* Political Economy
PCC	Partido Comunista de Cuba / Communist Party of Cuba
RDDNs	Recommended daily dietary needs
UBPC	Unidad Básica de Producción Cooperativa / Basic Units of Cooperative Production

CHAPTER 1: INTRODUCTION

"Cuba is sugar!" declared the tour guide as he expertly wielded a machete to demonstrate how to cut sugar cane on a plantation in Mantanzas Province, Cuba. Later that day the tour passed by an abandoned sugar mill and the guide lamented how the industry had fallen from economic prominence. The guide's affinity with the sugar fields in juxtaposition with the derelict infrastructure was my inspiration to explore the results of social and economic policy goals for national agriculture in Cuba.

This thesis reveals that the political entity of the Cuban state gave priority to the accumulation of social, political, and economic capital in an institutionalised hierarchy for the production of agricultural commodities destined for export. This approach created an economic base that depends on the coordinated social reproduction of generations of farmers skilled in the methods of industrial agriculture. The guide's declaration is a sociopolitical artefact of this approach. Paradoxically, this approach creates vulnerabilities in the production of the country's food supplies that result in tensions between policy tendencies for nationalised, trade-integrated agriculture and non-state, self-sufficient food production. These tensions are laid bare in Cuba's historical record of annual average consumption of the recommended daily dietary needs (RDDNs) during different periods of agricultural policy. For example, the Cuban state experienced a crisis of national production during the economic upheaval of the Special Period in Time of Peace in the first half of the 1990's, while the Cuban population experienced a crisis in consumption. These differentiated experiences challenged social-political relationships and undermined the reliability of trade-based food systems.

The Food and Agriculture Organization of the United Nations (FAO) recommends that, "The opportunities and risks to food security associated with trade openness should be carefully assessed and addressed through an expanded set of policy instruments" (FAO, 2015, 26). This study explores the processes of power between state and non-state actors for achieving food security in Cuba, and has found nascent social-political goals and relationships for food security that are increasingly focused on food self-sufficiency.

Knowledge is gleaned from this development to provide insight into policy approaches that strengthen food security while minimising future exposure to volatile global markets.

1.1 PRACTICAL PROBLEM

Agriculture is crucial to Cuba's national economy, but the accumulation of resources required for participating in international trade of agricultural commodities competes for resources that are needed for self-sufficient food production. The extensive allocation of land, labour, and other inputs to industrial production of exportable agricultural commodities created a situation in Cuba where, by the 1950's, "despite a rich soil, adequate rainfall, and a favourable labour-land ratio, agricultural production [of food] barely kept pace with population growth" (O'Connor, 1968). The country imported "between 30 to 35%" of basic food, like "rice, beans, fat, meat products, and canned fruit", mostly from the United States (Jiménez, 2003). This was a central issue for the revolutionaries of the Movimiento 26 de Julio (M-26-7) who overthrew Batista's dictatorship in 1958, and agricultural reform was a key strategy in the new Cuban leadership's plans for social and economic renewal. However, policy tendencies for centralised planning of agriculture persist in the Cuban leadership's economic and agricultural decision-making so that domestic food production continues to underachieve its full potential for feeding a nation so that there is a continued reliance on imported food.

This study addresses the practical problem of why, despite the Cuban government's strategic focus on domestic agriculture as a key sector for social and economic development, and a progression of food security policies to boost domestic food production and minimise food imports, there continues to be insufficient domestic food production (Nova, 2012) and there is an increased reliance on food imports (Díaz, 2014). This study contributes to a better understanding of the factors that contribute to the incongruity between national goals and results. The findings have significance for Cuba's leadership as it crafts policies and programs for food provisioning in a new period of social, political, and economic challenges that result from a faltering regional trade

regime with other Latin American states, changes in Cuba's national leadership, and uncertain policies for normalisation of United States/Cuba relations.

1.2 RESEARCH QUESTIONS

Despite having a favourable growing environment, and the technical and social capacities for growing food, Cuba's domestic food production does not meet political goals for becoming food self-sufficient. Contributing to this situation is the fact that the Cuban state favours an institutionalised structure of formal relationships for centralised economic planning and food production. Non-state food producers challenge the constraining concept of institutionalised agriculture and food systems. They instead emphasise the processes of change in relationships of power, and the mutual dependence between agency and structure. Many of these food producers advocate for food sovereignty as a means of building capacity for food self-sufficiency through the domestic production and trade of culturally appropriate food (CAF). Based on this predicament, key research questions for this thesis are: can food sovereignty serve as an alternative to institutionalised agriculture and food systems for achieving national food security in Cuba? And, what form of power-sharing relationships can be effective for achieving food sovereignty in Cuba?

1.3 RESEARCH PROBLEM

Food is a basic necessity of life and is essential for good health of all people, and it is the social and economic context of individuals that affects their capacity to access sufficient amounts of appropriate foods (Sen, 1999). The socioeconomic wellbeing of a state's constituency also determines state power (Disraeli, 1877), so access to sufficient quantities of healthy and culturally relevant food is a key interest of both the state and individuals. The *raison d'état* of government is to be a platform for collective action on matters of common interest (O'Reilly, 2011). Thus, the state has a role in creating policies that set the conditions for well-functioning food systems, and ideally works through interdependent relationships with its constituency to create those policies and carryout approaches that achieve food security.

National food security can be achieved through relationships of strong political power and centrally planned agriculture and trade, or through collaborative domestic arrangements of shared power and resources to become a food self-sufficient nation. This study finds a persistent thread of policy tendencies for central planning to grow agricultural commodities that are in tension with non-state producers that grow CAF. The value of CAF for the socialist state lies in the consolidation of Cuban society in the production of an identifiably Cuban product. The value of CAF for society lies in the economic, health, and familial benefits (Friedrich, 2014) obtained from having individual, family, and community power over resources to be self-sufficient.

In order to answer if food sovereignty can serve as an alternative to institutionalised agriculture and food systems for achieving national food security in Cuba, and what form of power-sharing networks can be effective for achieving food sovereignty, it is necessary to know what policy tendencies exist in Cuba's policy-making for food security, if those policy tendencies hinder agricultural innovation for growing domestic food and/or establishing domestic food markets, and to what extent current policies impact food self-sufficiency. Answers to these problems are found in Cuba's historical record of social-political relationships for the production and consumption of food during various eras of food policy networks.

Tensions between institutionalised agriculture and domestic food production are evident in the Cuban leadership's socioeconomic development policies made during the period of this study that begins with the Revolution in 1959. The sugar trade dominated the country's agriculture and economy until its collapse in the 1990's, and during this era, growers were accomplished in industrial agriculture and the government relied on international trade. However, a new food system was urgently required when the economy and industrial agriculture collapsed. Cubans relied on local farming and gardening as an alternate to industrial production and demonstrated a capacity for increasing yields of CAFs using practices that require fewer external inputs. However, large portions of the country's agricultural lands are still under-producing and the country continues to rely on food imports.

1.4 THESIS STATEMENT

Cuba's arable land continues to under-produce food crops and the country relies on imported food for achieving food security because of policy tendencies that persist in Cuba's leadership that favour international trade (Machin, *et al.*, 2013, 170) and centralised control of agricultural resources. This approach limits the full potential of small-scale farmers to produce food, restricts domestic producers from fully participating and benefiting in the national economy, and leaves Cuba's food systems exposed and vulnerable to international market shocks. However, evidence in Cuba's record shows that food sovereignty can play an important role in achieving national food security. That is, domestic food production of CAF can be increased and import dependency decreased through a food sovereignty approach that distributes land and decision-making authority for the use of scarce agricultural resources to non-state producers that abide by agroecological principles, and through market policies that prioritise domestically produced food over imported food.

1.5 BACKGROUND

Effective agriculture and food systems are required for achieving development goals to eliminate world hunger, such as the United Nations Sustainable Development Goal "to end poverty and hunger, in all their forms and dimensions…" (United Nations General Assembly, 2015). And because of the economic significance and cultural traditions of farming, agriculture and food are also important sectors for creating and maintaining political power (Todd and Waller, 2011; Valdés Paz, 2009). To understand how these tensions impact policy-making and policy effectiveness for achieving national food security, it is necessary to have a reasonable understanding about processes of power in agriculture and food systems.

By definition, food security is said to exist "when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" (FAO, 2003). Production is taken as an assumed function and does not factor into this definition. Including the how and where of food production as necessary functions of food security

leads to the working definition of food sovereignty: "the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems" (La Via Campesina, 2007).

Policy-making is a primary tool of government work, and policy approaches to achieving food security can be conceptually thought of as being on a continuum of policies that rely on regimes of international trade for food security on one end, and policies for reliance on domestic production for food self-sufficiency on the other (Clapp, 2015, 8) (Figure 1). Food security can be achieved through either policy tendency, but the concept of food security has been co-opted by policies with an "export vocation" (Rosset, 2009, 114). Alternatively, food security through self-provisioning has a "food-producing vocation" (Rosset, 2009, 115). That is, "the concept of food self-sufficiency is generally taken to mean the extent to which a country can satisfy its food needs from its own domestic production… [and] is linked to an overall perspective on development which emphasises the need for self-reliance, an auto-centric approach, whereas food security is consistent with a view of development which incorporates international specialisation and comparative advantage" (FAO, 1999).

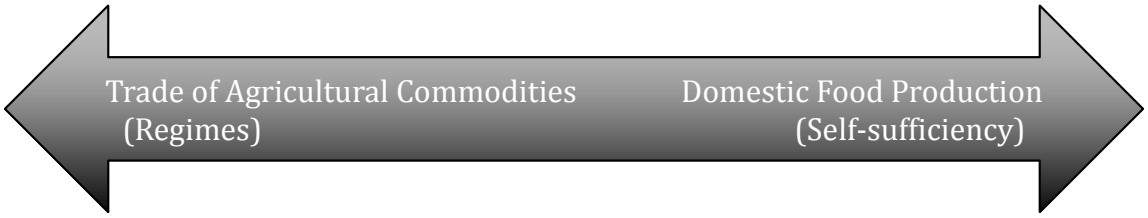

Figure 1: Continuum of policy approaches for food security.

Regimes are "sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations" (Krasner, 1983). Friedmann and McMichael introduced the theory of food regimes to describe the convergence that links "international relations of food production

and consumption" (Friedmann & McMichael, 1989, 95) during different periods of capital accumulation, and how these relations undermined sovereign policies directed at national interests. In this theory, the success of international food regimes depended on international relationships of organised power that accumulated machinery, land, labour and other agricultural resources for growing crops that were exported and traded as commodities. Although trade included food, the system of production also included commodities used as industrial inputs for manufactured goods (Friedmann & McMichael, 1989), and this competed with food production. This trend displaced peasant farmers, disrupted cultural traditions of agriculture, and contributed to the loss of local capacity and knowledge to be food self-sufficient.

The loss of local food producing capacity created discontent among dispossessed farmers and hungry populations, and when a food regime is faced with destabilising conditions its protagonists respond with policies to protect the regime. To increase food availability, a Green Revolution of intensive agricultural practices using modified plant species together with specialised machinery, irrigation, and intensive inputs of chemical pesticides and fertilisers started in Mexico in the 1940's (Sonnenfeld, 1992) and extended rapidly to many other parts of the world to revolutionise global food production. Because of this approach, there is enough food produced today to adequately feed the world's growing population (FAO, 2018; Friedrich, 2014). However, in the complex relations of food regimes that support the globalisation of agriculture and food systems, "[e]very state today has to transform into a network state and become part of a complex [regime] of power-sharing and negotiated decision-making processes involving transnational and national political institutions as well as market actors and NGOs" (Oosterveer, 2012, 30). This works to promote the validity of the food regime and undermines food sovereignty.

Food security is about having consistent access to food, and food sovereignty is one means of achieving national food security. However, proponents of industrial agriculture argue that food sovereignty is inefficient and incapable of ensuring food security. For example, Norman Borlaug, considered to be the prime protagonist of the Green Revolution, sees farming families to be "outside of the general economy" (Borlaug, *et al.*,

1969, 15) and that the "spectacular increase in yield [made possible by the Green Revolution] destroy, in one stroke, the built-in conservatism or resistance to change that has been passed on from father to son for many generations in a system of traditional agriculture" (Borlaug, *et al.*, 1969, 11). Clearly, the highly-industrialised approach of the Green Revolution is an economic manifesto to break the traditional customs of family farming and replace it with 'efficient' industrial agriculture. Borlaug's vision of the green revolution requires broad support from government (Borlaug, *et al.*, 1969), and the concept of food security has been made workable for policy-makers by excluding the important issue of food sovereignty, which has been marginalised and left to "movements that do less to directly engage the policy-making process" (Huish, 2008).

Political-economic relationships of power required for specialised industrial agriculture have exposed food systems to the variable demands of production and consumption of liberalised trade so that "815 million people still suffer from chronic hunger" (FAO, 2018). The global system of agriculture that has produced enough food for the World's population has paradoxically created national-level social, economic, and political challenges for feeding everyone. Global hunger is not due to a lack of ability to grow enough food, but to differentiated relationships of power (Sen, 1999) that create severe inequalities between international trade of agricultural commodities and local food. And, the organised structure of power relationships that dominate global agriculture makes it difficult for states to return to sovereign farming practices for food self-sufficiency.

Because Cuba's history of agriculture holds examples of participation in international food regimes and of domestic approaches to address challenges to national food security, a study of Cuba's experiences informs development approaches to food security more broadly. For example, in a manner consistent with Friedmann and McMichael's first food regime of the nineteenth century that was characterised by colonialism, Cuba was a colony of Spain and industrial agriculture of sugarcane was established on the island (Palma, *et al.*, 2015) as a means to support the Spanish homeland. Cuba was liberated from Spain, as a result of the War of Independence, but rather than becoming a fully independent republic, Cuba became a neo-colonial state of the United States. The Platt

Amendment to the *Army Appropriations Bill* of 1901 permitted significant American influence in Cuba while limiting other foreign intervention (National Archives, *n.d*.) and established the basis for the attraction of American investment in Cuba (Wright, 1931), mainly in the sugar industry. The United States exploited Cuba's identity as a sugar producing nation state to establish capitalist interests and engage the country's workforce in national economic development strategies that focussed on agriculture and related industries. An expression of national identity that was popular during the first half of the twentieth century was "sin azúcar no hay país" (without sugar there is no country) (Valdés Paz, 2009) – an expression very similar to our tour guide's "Cuba is sugar!" that was used in 2012 to express his national identity. The result was that "over one third of the nation's land was in the hands of approximately 250 large landowners" (Palma, *et al.*, 2015). Sugar cane was grown mainly on large private estates called "latifundias" (Valdés Paz, 1-2), and as much as "one-third of Cuba's labor force was employed in the sugar industry" (Schoultz, 2009, 122) to grow, harvest, and send the cane to sugar mills where it was processed into various products for export. By the 1950's the agro-economy of Cuba was dominated by trade relations with the United States and the country's land and labour force were producing sugar and, to a lesser extent, other export commodities like tobacco and coffee (Valdés Paz, 1-2). Sugar and its economic benefits flowed mostly to the United States.

Consistent with Friedmann and McMichael's description of factors that fostered a second food regime, Cuban nationalism developed alongside American neo-colonialism. A complicated succession of national sentiments and accompanying political events in Cuba included a Rebellion in 1933, abrogation of the Platt Amendment in 1934, and a new Constitution in 1940. Internal tensions were growing too, based on the wealth gap between wealthy foreign landowners and Cubans who lived "without the most elemental conditions of hygiene and health" (Castro, 1953, 81). In 1958, a rebellion carried out by the M-26-7 revolutionaries ousted the dictatorship of Fulgencio Batista, a close ally to the United States, who fled Cuba in January 1959. This marked the beginning Cuba's social and political Revolution to change the dreadful social conditions of the Cuban countryside (Castro, 1975, 75-81), primarily through land reforms (Castro, 1975, 75;

Valdés Paz, 2011, 73) to return land to the Cuban peasants. Replacing the consolidated land ownership characterised by the latifudios with distributed land ownership was a fundamental value for Cuban prosperity, because, as expressed by Cuba's hero of the War of Independence, José Martí, "A nation having many small landowners is rich. A nation having a few wealthy men is not rich, only the one where each of its inhabitants shares a little of the common wealth. In political economy and in good government, distribution is the key to prosperity" (Martí, 1977, 140). Moreover, "the greatness and prosperity of [Cuba] depends on a healthy and vigorous peasant who loves and knows how to cultivate the land" (Castro, 1975, 77).

The Revolution's leadership passed *Law 100* in February of 1959 (Valdés Paz, 2009, 155) to assign issues of agriculture to the Ministry of Defense. This was an important precursor to the oversight of "the Revolution's 'basic law'" (O'Connor, 1968), the *Law of Agrarian Reform*, promulgated on May 17, 1959 (Valdés Paz, 2009, 155). The intention of the first law of agrarian reform was to have a system of agriculture free from capitalism so that "Cubans will have their income increased and they will become buyers in the domestic market, which will be the basis of our industrial development. Through this, we expect to solve the economical problem of Cuba" (Castro, 1959). The law transformed the economy from "a privately-owned, capitalistic system into a planned economy [and] Castro founded the National Institute of Agrarian Reform (INRA) and appointed trusted members of the Rebel Army to implement reform [for a return to farming for food rather than growing agricultural commodities for export]" (O'Connor, 1968).

The revolutionary leadership nationalised foreign-owned agricultural assets and implemented policies to industrialise and diversify the economy in an attempt to achieve a domestic economic model to counter capitalist agriculture. During this effort, "Sugar production had been neglected as agricultural diversification became the goal and most resources were channelled to achieve the accelerated industrialization of the country" (Fraginals & Moreno, *n.d.*). Furthermore, diplomatic and economic ties with the United States were strained further, and in 1960 trade between the two countries ended.

However, the country's farming infrastructure was deeply embedded in global trade and replacing a capitalist food regime agriculture with a sovereign model proved difficult. The approach led to a significant trade deficit with those countries that extended credit, machinery, and technical assistance to Cuba for the country's accelerated industrialisation (Fraginals & Moreno, *n.d.*). Although initial efforts were intended to return land to small farmers for growing food and to end the country's reliance on a sugar trade, and although "INRA members had the revolutionary spirit and desire to implement reform, [they] lacked the technical expertise necessary to achieve its objectives" (O'Connor, 1968). In addition, "the peasants lost the will to plant crops and till lands, causing a food shortage in 1962 and a rationing system that still exists" (Pérez, 2006).

Cuba returned to being a network state in a food regime that put emphasis on growing sugar cane for trade, this time with the Council for Mutual Economic Assistance (COMECON) that was under the leadership of the Soviet Union. In order to gain state control of land to be used in the socialist food regime, "the second Agrarian Reform Law was passed [in 1963] where 70% of land became [state] owned" (Rodriguez, 1987). The Cuban leadership undertook significant steps to increase production in the sugar industry that was suffering from neglect from 1959 to 1963, and the Soviet Union set minimum quotas for sugar and bought it from Cuba at inflated prices. The USSR also agreed to take Cuba's excess production of sugar that was originally to be exported to the United States (Walters, 1966). Stable revenues from this and subsequent agreements enabled the Cuba's leadership to create jobs by hiring farmers as workers of the state, and to make investments in health and education systems that achieved outcomes rivalling those of other nations with greater per capita wealth.

In this period, Cuba also adopted practices that were developed during the green revolution to mass-produce and introduce new foods into the Cuban diet. This approach depended on a heavily subsidised industry of agriculture that relied on imported fertilisers, pesticides, farm equipment, and fuel. Cuba also relied on imported food, and the country imported two thirds of its food from the USSR. A secure supply of food was dependant on trade, and by the end of the 1980's, 85 percent of Cuba's trade was with the

USSR (Peet & Hartwick, 2015, 214) and about half of Cuba's national income was attributed to foreign trade. The economic reforms of *perestroika* in the Soviet Union and the eventual dissolution of the USSR had significant impacts for Cuba. Cuba's imports fell by 70 percent (COHA, 2010; Peet & Hartwick, 2015, 215) and the country's gross domestic product (GDP) decreased between 35 percent (Gapminder) and 50 percent (Peet & Hartwick, 2015, 215). These shocks left large portions of arable lands, previously used for growing sugar cane, idle. Furthermore, the disruption of imported agricultural supplies affected the domestic production of garden-variety vegetables that are common in the traditional Cuban diet. Production of lettuce, peppers, and tomatoes (Díaz, 2014, 143) declined by 65 percent from 1988 to 1994, beans by 77 percent, and roots and tubers by 42 percent (Altieri & Funes-Monzote, 2012). As a result, most Cubans were food insecure. The average daily intake of dietary needs from available food began to decline in 1990 and fell below the recommended daily intake by 1992 (Figure 2).

Cuba's participation in food regimes had ended, for the time, and in 1993 the government passed resolutions (Valdes Paz, 2009, 162) to begin the process of opening state-owned land to the Basic Units of Cooperative Production (UBPC), loosening restrictions on cooperatives made up of private producers in the National Association of Small Farmers (ANAP), and in 1994 formalised urban agriculture with the creation of the Comisión Nacional de Organopónicos and the Grupo Nacional de la Agricultura Urbana (GNAU) in 1997. Non-state food producers, both urban and rural, used methods for growing food that did not require significant amounts of agricultural inputs and their efforts resulted in a dramatic increase in yields. Production in 2007 compared to 1988 was up 145 percent percent for garden-variety vegetables, 351 percent for beans, and 145 percent for roots and tubers (Altieri & Funes-Monzote, 2012). This was accomplished with up to 85 percent less inputs of agrochemicals (Altieri & Funes-Monzote, 2012; Machín Sosa, *et al.*, 2013). Cuban's average daily calorie intake rebounded in 1996, and by 2000 consumed on average 100 percent of RDDNs (Figure 2). Cuba received international acclaim for its food policies that achieved a high level of food security (FAO, 2013; del Carmen Ramón, 2014). However, by 2004 natural and political events contributed to a significant decrease in domestic food production.

Hurricane Charley hit Cuba in 2004 and caused significant crop damage. A severe drought also began in 2004 that extended through 2005 when Cuba was hit by another damaging hurricane. As a result, the Bush Administration of the United States permitted limited sale of food to Cuba on a cash basis. Furthermore, in 2004 Cuba and Venezuela founded the regional trade alliance of ALBA, and there was an increase in international trade, including an increase in food and fertiliser imports (Machín Sosa, 2013, 110), and a decrease in domestic food production. In 2006 Raul Castro assumed the leadership duties for the Communist Party of Cuba (PCC) and was elected Cuba's president in 2008. In the period following, several economic reforms were implemented to "update the Cuban economic model" (Partido Comunista de Cuba, 2011).

Food security is a goal for both state-controlled and non-state agriculture, but a development focus on achieving national food security through production of commodities and trade can potentially overlook where and how food is produced and the many negative impacts that "food from nowhere" produced by institutionalised agriculture can have compared to "food from somewhere" (Bové and Dufour, in McMichael, 2009) that focuses more on localised food production, distribution, and consumption. Social and economic organisation for growing domestic food versus for producing export-oriented agricultural commodities are very different, and maintaining both forms of organisation creates tensions between collectivised, state-controlled agriculture and place-based, farmer controlled agriculture. These two different platforms of agriculture compete for natural, human, technical, financial and social resources, and have different outcomes in terms of social relationships for food security. Cuba is attempting to re-establish participation in global trade, while also continuing with approaches to support a sovereign food system. The tension between trade and self-sufficient approaches to national food security has significant nuance and provides challenges for Cuban policy makers and is evident in the Economic and Social Policy Guidelines of the Party and the Revolution (Partido Comunista de Cuba, 2011). The Guidelines were again updated in 2016 and continue to exhibit a strong dichotomy in approaches to develop international and domestic food systems.

The 2011 Guidelines exhibit policy tendencies that are designed to maintain central control over the country's agriculture and food systems to achieve national food security. For example, the guidelines contain long-term goals that tend toward the production of agricultural commodities and trade. These include a goal to have the agro-industrial sector "progressively contribute to the balance of payments… and reduce the high financial dependence that is currently covered by other sectors" (PCC, 2011, Guideline 177), and to "promote the development of coffee, honey, cocoa, and other areas for contributing to the gradual recuperation of traditional exportable products of agriculture…" (PCC, 2011, Guideline 194). However, Cuba recovered from the worst effects of undernourishment experienced during the Special Period based on the efforts of non-state food producers with less centralised oversight. Those producers demonstrated an extraordinary potential to produce high yields of food with minimal external inputs, and including this sector in a formal process for national food security holds potential to counter the vulnerability of international trade. The Guidelines do contain short-term goals that tend toward food self-sufficiency, such as: "effectively develop a municipal program of food self-sufficiency, relying on urban and suburban agriculture" (PCC, 2011, Guideline 205); "quit being a net importer of food" (2011, Guideline 177); and "the substitution of imported foods that can be efficiently produced in the country" (PCC, 2011, Guideline 184). However, updates in 2016 modified those goals and it has yet to be demonstrated if food self-sufficiency can be achieved through the dichotomy of being both a network state and a sovereign state in food systems.

Cuba is identified as having achieved many goals for national food security (FAO, IFAD and WFP, 2015), but those goals are not met entirely through domestic food production. Cuba participates in international food markets and relies on food imports. A return to being a network state in international food regimes requires participation in a political economy that supports global commodity chains needed to produce large quantities of agricultural commodities, including food, and distributes those commodities between interconnected centres of processing, distribution and final consumption. Food security is the guiding concept for governments and development agencies, and food regimes are the dominant framework in which nations work to attempt to provide sufficient food for their

populations. The challenges presented to small farmers in food regimes has given rise to a counter movement led by small-farmers for food sovereignty that focuses on localised food from somewhere rather than the faceless food from nowhere that can satisfy the definition of food security.

Food sovereignty emerged as a global counter-movement to industrialised food and its proponents have advocated for new principles and norms of globalised food regimes that include peasant rights and alternative food systems that are built from agroecological practice, local knowledge of farming, and local food systems (Machin, et. al, 2013, 36). Food sovereignty is an alternative to the decision-making in food production, distribution, and consumption dominated by economic rationale, and a development approach that follows principles of food sovereignty will have a different power-sharing arrangement than that of food regimes. Evidence of this is found in Cuba's success with increased food production and food self-sufficiency from 1994 to 2004 that came from the sort of agroecological practice and distributed decision-making advocated for by the proponents of food sovereignty.

This study of Cuban food systems is rooted in the framework of political economy combined with network perspectives to explore the country's contrasting experiences in food regimes and domestic food self-sufficiency. That is, Cuba makes an excellent subject for studying the concept of national food security because of its experiences as both a network state in various food regimes under Spanish colonialism, American neo-colonialism that established a capitalist economy in Cuba, and Soviet style socialism of centralised economic planning, and as a sovereign state with a focus on food self-sufficiency that depends on domestic relationships with Cuba's farming families and gardeners. Furthermore, recent social and economic policies indicate a blended food system of external trade and domestic relationships. National food security that depends on food imports and trade competes with domestic food self-sufficiency, and since 2004, aligning with the Cuban leadership's return to international trade, food production in Cuba has decreased and food imports have increased. This is problematic because Cuba is vulnerable to volatile markets. In contrast, national food security that depends on

relationships with farming families is lacking the consensus in Cuba's leadership necessary to prioritise this approach. Recent, unpredictable changes in international relations may open up fresh trade opportunities or be more restrictive for Cuba, and this gives renewed importance to understanding how differentiated access to rules and decision-making powers impact national food security through self-sufficient food sovereignty. To glean insights from this situation, this study uses quantitative data to calculate indices of food security and uses qualitative methods to describe actor networks through different eras of organisation in policy networks that correspond with changes in approaches to Cuba's food security.

CHAPTER 2: THEORETICAL FRAMEWROK

2.1 LITERATURE REVIEW

The answer to the research question, of what form of power-sharing relationships can be effective for achieving food sovereignty as an alternative to institutionalised agriculture and food systems for achieving national food security, is governed by political economy. A search of the literature provides a foundation for a theoretical framework of political economy (Smith, 2008; Marx, 1993) to explore how power has proceeded through political, economic, and social relationships since the beginning of Cuba's Revolution to impact production, distribution, and consumption in the country's agriculture and food systems.

2.1.1 POLITICAL ECONOMY

Economics is a science-based assessment of the production, distribution, and consumption of goods – including food. Policy is the expression of how relationships are organised. Together, political economy is the study and analysis of relationships and linkages between economic and political processes (Gregory, *et. al.*, 2009, 547; World Bank, 2008, 4). Adam Smith articulated the concept of political economy in the late 18th century (Smith, 2008), and David Ricardo (1819) and John Stuart Mill (1848) further elaborated on Smith's work to become known as a classical approach to political economy.

Classical political economy is the foundation of liberal economic theory in which individual actors produce goods only when profit outweighs an actor's cost of production. In this production-centered approach, distribution is secondary. That is, the distribution of produced goods occurs in a system of social rationality between individuals that produce goods for their own benefit while unknowingly contributing to an overall distribution of social benefit by means of Smith's often-referenced 'invisible hand' (Smith, 2008, 349). The rationality of classical political economy is also a foundational characteristic of Western modernity, and the basis of development theories (Peet & Hartwick, 2015, 2) that hold development as synonymous with economic growth,

and the *economy* as the most salient aspect of classical political economy. This rationality creates a separation of purpose for state and society. Focus is placed on the individual, and the state is only as powerful as needed for maintaining individual liberties (Gregory, *et al.*, 2009, 417) by providing institutions of defense, justice, education, and commerce (Cox, 1981, 126-127) – social institutions that have individual and social benefit, but that could not repay any individual the expense of establishing those institutions (Smith, 2008, 559-560).

In 1859, Karl Marx provided a critique of the classical political economy in which he argued that individuals are embedded in a political superstructure where "the producing individual, appear to be dependent and to belong to a larger whole" (Marx, 1993, Appendix 1). Marx saw "[p]roduction in general [as] an abstraction" (Marx, 1993, Appendix 1), although a useful abstraction for an analysis in which "distribution is not regulated by production but, on the contrary, production by distribution" (Marx, 1993, 120). An example given by Marx, relevant to this study of Cuba's agriculture, is that "in the course of a revolution, a nation may divide large estates into plots, thus altering the character of production in consequence of the new distribution" (Marx, 1993, 120). Marx's work was foundational for development as a consequence of the "politics of development, meaning collective, social control over the economy" (Peet & Hartwick, 2015, 210). For example, Marx believed in the potential for science to bring about significant changes, but development and dissemination of technology generally requires coordination of resources beyond the capability of any one individual; thus, the *political* aspect of political economy is most salient in Marx's 'critical political economy.' That is, "when we speak of production, we always have in mind production at a definite stage of social development, production by individuals in a society" where "[i]n the social production of their existence, men inevitably enter into definite relations, which are independent of their will, namely relations of production appropriate to a given stage in the development of their material forces of production. The totality of these relations of production constitutes the economic structure of society, the real foundation, on which arises a legal and political superstructure and to which correspond definite forms of social consciousness. The mode of production of material life conditions the general process of

social, political and intellectual life. It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness" (Marx, 1993, Preface).

2.1.2 FOOD SECURITY

During the early half of the 1980's many countries were having difficulty providing enough food for their citizens. For example, food and other consumer goods were often rationed and expensive in the USSR. And, in an extreme example, from 1983 to 1985 Ethiopia experienced a devastating famine. This was despite the fact that global food production was adequate to feed the world's population. In fact, "[i]nternational prices of all the main cereals declined (in US dollars) in the first two months of 1985 because of ample supplies from 1984 crops and the generally favourable prospects for global production in 1986. Despite lower prices, however, the food security of the developing countries [continued] to be adversely affected by their lack of access to the plentiful supplies of most basic foods on world markets, because of the inadequacy of their foreign exchange resources" (FAO, 1985). The commodification of global agriculture made food to be just one output of a complex agricultural system that was exposed to volatilities of production and consumption of various agricultural commodities. By 1989 "[s]ome important agricultural commodity markets [had] shifted from having a global surplus to a situation of relative scarcity, and international prices increased significantly, after having fallen to their lowest levels in many years" (FAO, 1985).

The global food situation during the 1980s followed the expansion of an American approach to economic growth to the Third World. This approach adhered to development models of modernisation and dependency and culminated in private capital being aligned with the state to exploit wage labour and accumulate agricultural resources for agri-food corporations. This resulted in dispossession of farmers and making it unable for them to participate in complex global commodity chains. This hastened dispossession of small farmers and reproduction of wage labour for industrialisation. Agriculture and food systems are key mechanisms and indicators for economic development, and the corporate accumulation of natural and financial capital had significant environmental and social

impacts that were brought into focus in 1987 by the United Nations' Brundtland Commission (WCED, 1987). The Commission released a global agenda for sustainable development that included recommendations for achieving food security through industrial reform and terms of trade that favour small farmers – a call to reclaiming local powers and self determination of agricultural and food systems.

In this study, I posit that national food security can be measured in terms of annual average consumption of RDDNs obtained through an industrialised approach to global production and trade of agricultural commodities and/or through domestic production and consumption of food. Embedded in this theoretical model of food security are the concepts of food regimes (Friedmann & McMichael, 1989) and food sovereignty.

2.1.2.1 FOOD REGIME THEORY

Food regime theory is a concept that is used in this study to view the Cuban leadership's approach to solving problems of inadequate domestic food production and reliance on imported food. It is concept of theoretical realism in which a fixed political economy of "prevailing social and power relationships and the institutions into which they are organised" (Cox, 1981, 128) guides decision making. Regimes are "sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations. Principles are beliefs of fact, causation, and rectitude. Norms are standards of behaviour defined in terms of rights and obligations. Rules are specific prescriptions or proscriptions for action. Decision-making procedures are prevailing practices for making and implementing collective choice" (Krasner, 1983). Food regimes converge on international relations for the circulation of agricultural capital in which the state is an important actor for consolidating diverse expectations between social distribution and economic production. In food regimes, prevailing practices for production and distribution that are formally developed in political institutions and are expressed in the economic relationships between nations and commodity producers.

Friedmann and McMichael introduced the concept of the "food regime" as a theoretical and practical means of historicising and analysing the pathways of agricultural

development that undermined "state policies [that directed] agriculture to national ends, such as food security, articulated development and the preservation of rural/peasant communities" (Friedmann & McMichael, 1989, 95). Food regimes are rooted in the analytical tradition of political economy to describe how shifting balances of power proceed (Oosterveer & Sonnenfield, 2012, 17) through established norms of definite international relationships by linking "international relations of food production and consumption to forms of accumulation broadly distinguishing periods of capitalist production" (Friedmann & McMichael, 1989, 95).

Friedmann and McMichael describe the global expansion of food regimes in two periods; the first characterised by British colonialism, and the second coinciding with the end of colonialism and stabilisation of the nation-state system. They also proposed that rules established in the second food regime, and being extended to Third World countries at the end of the 1980's, to achieve national economies in which "agriculture and industry complement one another dynamically", had theoretical shortcomings and practical obstacles that were fixed by "historical relations between 'agriculture' and 'industry' [that had] been more fluid and global in scope" (Friedmann and McMichael, 1989, 93). Although Friedmann and McMichael described this destabilisation, they do not explicitly identify it as the beginning of a third food regime in which states are challenged by corporate hegemony, or were they able to predict the challenge by a peasant-led counter movement to relocalise food policies and markets. This study draws from food regime theory and proposes that current food policy tendencies in Cuba for trade oriented food security are being challenged by non-state food producers, to replace industrialised agriculture with agroecology and food sovereignty.

Friedmann and McMichael's food regime concept emphasised the historical circulation of capital and the role of agri-food and geo-politics in creating regimes with competing and complementary movements in each. That is, during the first food regime, 'settler states' provisioned "a growing European proletariat with wage-foods" (Friedmann and McMichael, 1989, 94). Colonisation required political organisation far from the British centre of control, so that the stabilisation of colonialism was a condition for its

destabilisation and the rise of "the nation-state system" (Friedmann and McMichael, 1989, 95) in which "settler nations developed representative governments which regulated the national economies within their jurisdictions" (Friedmann and McMichael, 1989, 96).

The stabilisation of the nation-state system marked the beginning of the second food regime and the competing but complementary movement of the second food regime was the transnational movement of capital, led by United States corporations, that destabilised the nation-state system and reformed production and consumption relations so that national policies responded to the needs of transnational agro-food corporations rather than agricultural development serving nation-state development. The United States, having been a settler state during the first food regime, developed inter-sectoral exchanges in the national economy while also looking to international export markets, and was positioned in the food regime concept as the theoretical and practical link between the two food regimes (Friedmann and McMichael, 1989, 95). This "ideal of national inter-sectoral balance [had] gained currency with [the decline of British hegemony] and the rise of American hegemony and the proliferation of modernization and dependency theories that generalised the American model" (Friedmann and McMichael, 1989 93).

The "food regime analysis greatly enriched the means available for a theoretical and historical framing of capitalist world economy with reference to agriculture" (Bernstein, 2016, 612); but this is a First World point of view. And during the post-war era in which capitalism and 'Golden Age' development theories flourished, Second World communist countries like China and the Soviet Union were experiencing their own economic dynamism (Payne & Phillips, 2010). The original food regime analysis ignored the influence of non-capitalist agricultural policies and in a larger three-world concept of development, and the narrow scope of early food regime analysis may have missed the potential impacts of a broader world order. That is, the concept of the Third World was a capitalist distinction to identify developing countries positioned in an expanded economic structure whose resources were exploited by the First World and pursued by the Second

World. It was assumed that Third World countries had internal deficiencies that inhibited their 'modernisation' and ability to grow articulated economies (Rostow, 1959) rather than noting their position of disadvantage in a capitalist order, and further assumed that without the support of the First World, their economies would not survive. This way of thinking by the United States' leadership played an important role in their decision to place a trade embargo on Cuba (Schoultz, 2009, 123) – a move that ultimately proved not to make Cuba compliant in First World capitalism, but to align with Second World communist states.

On the matter of Friedmann and McMichael not inferring emerging food regimes, food regime analysis is retrospective and can only be elaborated on as time passes, so they did not fully examine the contradictory forces emerging in the second food regime, even though a tension between two movements was evident. That is, Friedmann and McMichael described two historic food regimes, each with opposing movements – the stabilisation and completion of one movement as the condition for destabilisation and shift to the other. In the first, 1870 to 1914, agriculture underwrote a British hegemony of colonisation and nationalisation. At the beginning of the second, 1947 to 1973, nationalism became complete, but the creation of competing economies and comparative advantage led to the "simultaneous weakening of [national economies] through the transnational restructuring of agricultural sectors by agro-food capitals" (Friedmann and McMichael, 1989, 95) so that national economies became subordinated to capital. Furthermore, by the end of the 1980s, calls for a movement to counter neoliberalism through re-localisation of policies for food production and consumption relations, like that call in Brundtland's Report (WCED, 1987), were already being made. Although Friedmann and McMichael did not hypnotise a third food regime or include non-capitalist economies in their analysis, they did offer an alternative to address the destabilising global policies perpetrated by industrialisation of agriculture through the "promotion and redirection of regional, local, and municipal politics… for land use and taxation policies favouring local economic linkages" (Friedmann and McMichael, 1989, 113). With the challenge to neoliberalism that was occurring by the end of the 1980s and the divergent direction that was occurring in some developing countries to break free from the idea of

internally deficient countries, it might have been possible to extend the historical pathways forward and identify food sovereignty as an alternative to neoliberalism.

Friedmann and McMichael's original analysis was a retrospective analysis of socio-political and economic pathways that led to a shift from "state to capital as the dominant structuring force" of agriculture's role in national economic development, and an eventual "restructuring of the state system around the division and recombination of industry and agriculture" (Friedmann and McMichael, 1989, 112). The insights presented in Friedmann and McMichael's seminal article were introduced at a time when developing states were agreeing to structural adjustments that ceded even more capacity "to regulate domestic production and trade" (Friedmann and McMichael, 1989, 94) to transnational agro-food corporations that dispossessed those states from their productive resources and incorporated them into a global structure, and provided a framework for historical analysis of this dispossession.

There has been significant elaboration of the food regime concept since its introduction that make it possible to analyse tensions in the globalisation of food and a counter movement to re-localise control over productive and consumption relations. Bernstein provides a "survey" of developments that includes a summary of complementary elaborations, offered individually by both Friedmann and McMichael. These elaborations build a case for a possible third food regime characterised by the completion of international trade, that is dominated by corporate agribusiness, in tension with a peasant led alternative to decommodify food and add greater ecological valuation. For example, Friedmann postulates that the division and recombination of productive resources into specialised manufacturing and distribution networks further strengthened agro-food while weakening state sovereignty over resources, so that "agro-food corporations having now outgrown the regime that spawned them… are the major agents attempting to regulate agro-food conditions, that is, to organise stable conditions of production and consumption which allow them to plan investment, sourcing of raw materials, and marketing" (Friedmann, in Bernstein, 2016). One such move to stabilise the investment environment is to establish agriculture with fungible outputs that flow through complex commodity

chains. For example, feed stock for biofuel production or feed for livestock are commodities that compete with food. This commodification puts more focus on outputs for global supply chains, and less on agriculture itself. And, because food commodities are a focus of industrial agriculture, the rhetoric of 'food security' is used by corporate agriculture and their political allies to further stabilise the investment environment, creating environmental, social and economic problems in its wake.

Small-scale agriculture practitioners generally do not have adequate resources to compete in complex commodity chains and are left with few alternatives other than to relinquish their resources to the state or agri-food corporations. However, many of the remaining and dispossessed farmers, from diverse cultural backgrounds, have joined together in global peasant movements to demand an alternative approach to production and consumption relations that can restore local economies, democratic relations, and environments that have been significantly altered by industrial agriculture. Because this countermovement advocates for solutions in so many places and against numerous effects, some have criticized it as being too diverse. In fact, in 2005 Friedmann was still uncertain if a counter movement existed, as seen in earlier food regimes. She suggested that if a third regime was emerging that it was a "corporate-environmental food regime" based on "demands by environmental movements, and including issues pressed by fair trade, consumer health, and animal welfare activists" (Friedmann, 2005, in Bernstein, 2016, 625). Dispossessed small-hold farmers (peasants) were not one of the actors identified. McMichael, was more definitive in his elaboration of food regime analysis and of a third food regime. According to McMichael, "liberalization (currency devaluation, reduced farm supports, and corporatization of markets) [have rendered] farmers everywhere vulnerable to dispossession as a precondition of the construction of a world agriculture" (McMichael, 2005; in Bernstein, 2016, 626). Thus, the peasant counter-movement is in tension with a neoliberal regime of world agriculture where "the prevalence of food [is] consumed far from where it is produced, hence a kind of generic 'food from nowhere'… 'and a place-based form of agro-ecology (food from somewhere)'" (McMichael, 2009, 147, in Bernstein, 2016, 628).

Bernstein is critical of what he coins as McMichael's "peasant turn" to lead the countermovement for relocalisation and repeasantisation of food systems for social justice and ecological protection against the destructive forces of capitalism (Bernstein, 2016, 638). He argues that the sudden reformulation of 'the peasant question' is peculiar given that peasants were absent in the analysis of the first and second food regimes. He more explicitly asks, "who are peasants and what equips them to be the 'world-historical subjects' of our times…? And indeed, a 'class' or with class-like characteristics?" (Bernstein, 2016, 640). McMichael responds to Bernstein and seeks to clarify that food regime is a form of analysis only – an analysis of "global power relations through the agri-food lens" (McMichael, 2016, 650). The current food regime analysis is "not about the peasantry per se; rather, it is about the food regime and a counter-hegemonic movement inspired by peasant organisations" (McMichael, 2016, 648). It is about "initial peasant organisations coming together to articulate a central contradiction… that a claim for food security via neoliberal institutions/policy is an illusion, and has enabled an architecture of dispossession and monopoly power" (McMichael, 2016, 651). Thus, the tension is not a simple binary between capital and peasant; rather, it is a tension between neoliberal globalisation of food from nowhere to that of place-based agroecology of food from somewhere that has been articulated by peasant organisations as food sovereignty. From this perspective, the 'peasant question' that emerges is not of the traditional sort of whether or not peasants will easily convert to proletariats; rather, it is whether or not peasant knowledge and agroecology principles will be used to lead change in the neoliberal food regime.

Kees Jansen has followed Bernstein and McMichael's debate on the food regime, and brings a new perspective (Jansen, 2015, 213). Jansen claims that the food sovereignty movement does not reveal a crisis in globalised "agrarian capitalism, but reflects a crisis of those who are unable to participate in this agrarian capitalism" (Jansen, 2015, 219). In his view, many peasants would rather "escape the marginality of rural life by becoming successful agricultural producers, who are incorporated into larger commodity networks and able to compete in wider national and international markets" (Jansen, 2015, 228). So, in Jansen's view, the peasants that are claiming to be advocates for food sovereignty

would in fact become subsumed into the capitalist agrarian structure if they were to gain access to credit, low input costs, and cooperative markets that provide high prices for their produce to eventually become agricultural industrialists.

Jansen also takes the position that peasant knowledge of agroecology is "uncritical" and inferior to "science-driven technological innovation" (Jansen, 2015, 214). This position is reminiscent of modernist development theories and Western perspectives that were so effective in entrenching neoliberalism and that have failed those that do not see the world from this perspective.

Finally, Jansen claims that food sovereignty is not a valid alternative or counter-movement to corporate agriculture that can turn up or turn down the amount of artificial input to mass-produce food commodities as needed. He questions the notion that low input agroecology that has higher labour requirements with less input is a valid means capable of levels of productivity capable of feeding the world's population. In fact, Jansen posits that small-holder agriculture needs industries to support it (Jansen, 2015, 228).

Jansen's claims do not recognise the contribution that food regime analysis brings to the food sovereignty debate. That is, he does not recognise the historical tensions of food regimes between the stabilisation of a dominant rules and rule-making – the forces of that stabilisation that lead to a destabilisation – and a subsequent stabilisation of a new set of rules and way of rule-making. Neoliberal hegemony of global food systems has become the dominant way of viewing complex agriculture and commodification of food that has also created social, environmental and political pressures that are calling that system into question, destabilising its validity, and creating space for a movement that counters those powers and forces of neoliberalism. Global food production has increased at a rate that outpaces population growth so that more than enough food is produced to sufficiently feed the planet's nearly 7.5 billion human inhabitants. Paradoxically, the global integration of agricultural systems that produces most of this food also contributes to global hunger. That is, historical relations between state and capital have enabled rapid expansion of capitalist agriculture by accumulating agricultural resources from

dispossessed peasants; commoditising food into complex, industrial supply chains that made peasant farmers less competitive; and subsuming peasants into a global wage-labour workforce, which correlated with urbanisation and an emptying of the countryside. Consequently, many countries, particularly in the 'global South, have experienced a shift from food self-sufficiency to food dependency and, "Over 90 percent of the world's hungry are simply too poor to buy enough food" (Holtz-Giménez, 2009: 143). Food sovereignty has appeared as a countermovement to the dominant forces of global agriculture.

Although, "the 'food regime' is a capitalist world order with specific rules structuring the production and consumption of food on a world scale" (Friedmann 1993, in McMichael 2016: 663), it also describes how ruling relations of food production and consumption cycle through periods of relative socio-political stability, emerging conditions that instigate instability and counter movements, and establishment of a new regime. This process can be applied to a socialist economy if viewed through the lens of adaptive renovation cycles. Holling developed the theory of adaptive renovation cycles (Holling, 1986) to describe ecological systems, but it is a theory of the processes of increasing organisation and occasional disruption like that displayed in food regime theory. The theory of adaptive renovation cycles also connects global change with local reorganisation, and Palma *et al.* (2015) have applied the theory to the analysis of Cuban agriculture, and their work informs this study of the social, political, and economic changes occurring in Cuba's agriculture and food systems. Changes from 1959 to 1989 occur in phases of food policy renovation, growth, and maturity, followed by phases of collapse and renovation from 1990 to 2003 that are characterised by "innovation and learning by a variety of social actors in complex adaptive systems" (Palma *et al.*, 2015, 78), and continues as a phase of growth from 2003 to 2013. Thus, capitalist-based food regime theory is usefully applied to the study of food and agriculture systems in socialist Cuba by applying Holling's theory of adaptive renovation cycles to focus on the organisation of local relationships in food regimes rather than only on changes in the allocation of global capital.

2.1.2.2 FOOD SOVEREIGNTY

The food regime concept, introduced in 1989 by Friedmann & McMichael, considers how rule-making power in capitalist agriculture is countered by opposing forces that work to destabilise dominant rules and install new nodes of rule-making power. The hegemony of global food systems was bolstered by free-trade and policies for socioeconomic restructuring that were imposed on developing countries. These enabled rule-making power to shift from states to corporations so that neoliberalism became the dominant way of viewing global agriculture and commodification of food. The social, environmental and political consequences of this power shift have created space for a food sovereignty counter-movement that challenges the global food regime. Food sovereignty is a theoretical concept in critical theory that questions the assumed constraints imposed by institutions and exposes processes of change that rely on interdependent power-sharing.

The original "call to sovereignty was a conscious effort to bring power back to the state from deregulated markets and free trade regime" (Shattuck, 2015, 423). However, "Food sovereignty is not a fixed principle, it's a process" (Nicholson in Shattuck, 2015, 422) and over time, "Scholars have noted serious tensions between the interests of different participants in the food sovereignty project… [that] have motivated scholars to question whether food sovereignty can be more than a political slogan" (Shattuck, 2015, 422-423). Tensions that present significant challenges to the food sovereignty movement include: the validity of a global peasantry, rivalries and/or synergies between food sovereignty advocacy and practice, and competing (external/internal) sovereignties. Given the wide range of claims and tensions in the current call to food sovereignty, a key question emerges: if food sovereignty it is a counter movement in a food regime dominated by neoliberalism, what is the practical form of a food sovereignty power structure?

On the first challenge to food sovereignty – the validity of a global peasantry – the food sovereignty movement originated with "self-described peasant organisations" from around the world that joined together "to 'globalize (their) struggle' against the onslaught of neoliberal policies" (Schiavoni, 2014, 1). However, some scholars debate the

existence of a peasantry, let alone a global peasantry. And without a global peasantry, is the food sovereignty movement a valid source of power from which to realise an alternative to neoliberalism?

Henry Bernstein asks if the diversity in social categories of peasants, such as small-farmers, are "inherently coherent and useful [in identifying a discrete group from neoliberal agriculture] … Or does their lumping together simply serve to construct a common 'other' to large scale farming?" (Bernstein, 2013, 13). His answer to this is that "there are no 'peasants' in the world of contemporary capitalist globalisation" (Bernstein, 2013, 15). Rather, capitalism happens on different scales, and small farms are in fact part of a process of "'relentless micro-capitalism' of petty commodity production" (Bernstein, 2013, 15). By this account, the food sovereignty movement cannot be a valid alternative to neoliberalism because it is embedded in capitalist commodity production, only on a smaller scale.

What was not considered from this point-of-view is that socioeconomic restructuring in developing countries pushed those states into trade policies for attracting foreign investment, favouring exports of prime commodities, and accepting cheap food imports. The lack of laws for protecting peasant farmers from speculation, land grabs, and cheap food being priced lower than local, peasant-grown food worked as a subsidy for industrialised food and disincentive for peasant farming. Peasants and industrialist are discrete sectors, and peasant farming is rejected by neoliberalism.

Eric Holtz-Giménez considers the global peasant coalition of La Via Campesina as the unifying force that can "advance an agro-foods movement capable of contesting deregulation, globalization, and agro-ecosystem degradation" (Holtz-Giménez, 2009, 144). For Holtz-Giménez, there is a global peasantry, albeit a changeable one that has survived neoliberalism through "de-peasantization and re-peasantization [that] has led to shifts in crops, hybridized forms of production, and a heavy reliance on off-farm income and remittances" (Holtz-Giménez, 2009, 144). Peasant populations are not a homogenous global group, but they do share a reality of being faced with a diversity of cultural, environmental, and economic hardships brought about by dominant forces in

neoliberalism. Neoliberalism serves as a coalescing subject for peasantry to rally against – in a global movement for sustainable, democratic and socially just food systems.

On the second challenge to food sovereignty – rivalries and/or synergies between food sovereignty advocacy and practice – "Two distinguishable currents can be identified from [the 'transnational agrarian movements' of peasants]. One is made up of peasant organizations and federations focussing primarily on new agrarian advocacy – like Via Campesina. The other trend is made up of smallholders working with non-governmental organizations (NGOs) that focus primarily on developing sustainable agriculture – like Campesino a Campesino" (Holtz-Giménez, 2009, 145). The political origins of these two approaches are different and require different organisational structures that can sometimes be adversarial; "particularly between non-governmental organizations interested in implementing programs in the interests of farmers, and farmers' organizations interested in implementing their own programs" (Holtz-Giménez, 2009, 145). But, Holtz-Giménez argues that there is synergy between the two currents of advocacy and practice.

The practical basis of on-farm practice for food sovereignty is agroecology. Agroecology incorporates ecological principles into agriculture to minimise external inputs, benefit from and sustain ecological characteristics, and develop farming practices learned from traditional knowledge and local food system experience. It is about more than a set of practices, it also links "ecology, culture, economics, and society to sustain agricultural production, healthy environments, and viable food and farming communities" (SosteNica, 2016-17). Installing communities as the primary node of rule-making power in a food regime currently dominated by institutionalised political economy requires advocacy.

One example of synergy is found in Brazil's Landless Worker's Movement (MST). The MST is a movement of landless peasants that organised to take advantage of a clause in the country's constitution, "mandating that land serve a social function" (Holtz-Giménez, 2009, 148), to reoccupy idle land and adhere to agroecological principles to achieve agrarian reform and build communities. The advocacy of this group advanced "political

and social goals [consistent with] food sovereignty… [and] agroecological policies at state and federal levels" (Holtz-Giménez, 2009, 149). This approach demonstrates how inequalities of food regimes can be overcome by working within dominant structure of political economy. That is, non-state actors interact with the dominant structure to participate in broader policy networks that create and extend policies that promote food sovereignty as a primary approach to food security, without enduring significant upheaval in state institutions.

MST's success in Brazil was based on constitutional law and demonstrated the need for political influence and advocacy beyond the farm, and "food sovereignty is gradually moving beyond the fringes into policy-making spaces" (Schiavoni, 2014, 2), and this raises further challenging questions about competing (external/internal) sovereignties.

The food sovereignty movement was borne as an autonomous ground-roots response to states ceding decision-making power to corporate interests that facilitate neoliberal policies. However, more governments, from national to local, are now considering or have incorporated food sovereignty principles into law. Schiavoni points out that this creates philosophical, political and practical problems for the food sovereignty movement (Schiavoni, 2014, 2) and raises questions about the movement's need to redefine its terms of engagement with the state. This is true, to a point. That is, although originally autonomous from the state, food sovereignty is a resistance to neoliberalism that has weakened state power through deregulated markets and free trade. Therefore, as a resistance to neoliberalism it is also inherently an ally to the state. This is very relevant to Cuba's situation, as a primary basis of the Revolution was to counter capitalist agriculture.

Schiavoni uses Venezuela as a case study for examining the relationships of competing sovereignties through analytical lenses of scales, geographies and institutions to offer insights on how these competing sovereignties are "shaping the political construction of food sovereignty" (Schiavoni, 2014, 18). As a strategic state-led effort to gain popular support, Venezuela attempted to restructure the relationship between state and society to build democratic, sustainable and just food systems that were distributed across

bureaucratic institutions and community-run networks. This intersection of state and society exhibited competing sovereignties between the state's desire "to assert their sovereignty over domestic food systems in the face of neoliberal policies to be reconciled with the desire for communities to assert their own sovereignty over local food systems" (Schiavoni, 2014, 4).

Schiavoni lauded the successes of the Venezuelan project in reconciling those competing sovereignties, but recent developments have revealed that political power and interests remained in conflict with community interests, and food systems remained deeply connected with national economics. The country is now suffering from perhaps the highest inflation rate in the world and its citizens cannot produce or buy sufficient amounts of food. Any hard-earned gains in food sovereignty appear to have been reversed because of an inherently structural conflict between corporate/state and national/local nexuses of power.

Another example of competing sovereignties requires a rethinking of territory. Most food-production capacity tends to be in rural communities while most people live in urban communities that depend on surplus production in the rural. Reconciling urban-rural competition will require a relational emphasis of shared identities and struggles rather than markets alone. Furthermore, who are the sovereign in food sovereignty is not clearly defined. That is, "Is it the nation-state, a region, a locality or 'the people'?" (Edelman, 2014). I argue that food sovereignty is scalable and depends on context. And, in the context of this study, national food sovereignty is explored in Cuba.

On the question of, "what is the practical form of a food sovereignty power structure?", a key finding in Schiavoni's work is that food sovereignty is a process rather than an end and depends on relationships that require "institutional arrangements that are flexible and dynamic and that create spaces for interaction" (Schiavoni, 2014, 19). These relationships must occur in a complex situation of shared power where states can bypass bureaucratic structure to transfer control directly to social actors at the level of implementation, and community leaders who are able to interface with the state to assume new responsibilities and draw from state resources to carry them out. Achieving

this requires a nuanced approach to fit regional conditions, but must take place across different scales, geographies, and institutions.

The food sovereignty movement advocates for an alternative to neoliberalism, for peasant rights, and for alternative food systems that are built from agroecological practice and local knowledge of farming and local food systems. And, the state has the power "to enact comprehensive agrarian reform… renegotiate international trade pacts, publicly fund agroecological research and extension, or build national food reserves" (Shattuck, *et al.*, 425). The social actors in the food sovereignty movement are not autonomous from the state. The state must regain some power and control back from international agri-food and implement policies to legally recognise food sovereignty principles. This recognition requires that power and control be shared with food sovereignty movements with a social provenance so they can practice.

There is no standardised set of principles that apply at all places at all times, but a food sovereignty power structure is very different from the top-down decision-making political structure that acquiesces to transnational agri-food that dominates the neoliberal food regime. This requires that "social relations, and not food as such, are the centre of analysis (and activism), then food sovereignty principles may translate more clearly" (Figueroa in Shattuck, *et al.*, 427). Food sovereignty is broadly defined, and this "means that it can be used as a basis for building coalitions between diverse actors" (Shattuck, *et al.*, 428). The final structure of these relationships needs to support "a space to build democratic food and economic systems, and just and sustainable futures" (Nyeleni Newsletter, 13 March 2013, in Shattuck, *et al.*, 429).

In summary, current debate on food sovereignty questions whether food sovereignty is a valid alternative to the neoliberal food regime. The most foundational challenge is whether a peasantry exists. If there is one, are they able to organise across appropriate scales, geographies and institutions to implement agroecological principles for growing enough food to feed the world's population. There is enough evidence to conclude that a coalesced peasantry is sufficiently organised to popularise food sovereignty principles,

but final goals will only be achieved through new relationships via the state and differentiated urban/rural populations.

2.1.3 NETWORK THEORY

The Cuban state, in the period since the beginning of the Revolution to today, set policy goals for national food self-sufficiency that reflect the social, political, and economic conditions and viewpoints at the time they were developed. Macro policies in Cuba such as land reform, nationalisation of resources, and alliances with foreign states are made in an institutional hierarchy in which the government makes policies, consolidates resources, and coordinates implementation down through bureaucratic levels. This approach to food security works best when applied to "stable and well-established systems of agricultural production" (Busch & Juska, 1997, 703), and policies created in periods of stability provide feedback and informs the reorganisation of incentives for extending favourable polices that reinforce and maintain stability, and create development pathways that resist radical institutional change (Coleman, Skogstad, & Atkinson, 1996).

Peter Hall describes a "social learning" model (Hall, 1993, 275) of policy evolution in which policy changes during periods of stability can proceed through orders of change that are relatively independent of social actors (Hall, 1993; Coleman, Skogstad, & Atkinson, 1996). First order changes are described as changes in "instrument settings… in the light of experience and new knowledge, while the overall goals and instruments of policy remain the same" (Hall, 1993, 278). Second order changes are described as occurring when the "hierarchy of goals… largely [remain] the same but the techniques to attain them [are] altered, as a result of dissatisfaction with past experience" (Hall, 1993, 278). Moreover, policy changes during dramatic institutional upheavals, as seen in Cuba following the collapse of the USSR, are third order changes characterized by "new theoretical and ideological framework or paradigm, and typically involves both state and societal actors" (Hall, 1993; Coleman, Skogstad, & Atkinson, 1996, 274).

Hall's social learning model is skeptical about the possibility "to change policy significantly without either changing or by-passing existing policy-making institutions"

(Coleman, Skogstad, & Atkinson, 1996, 274). From this point of view, a significant policy shift to food sovereignty as a primary approach to food security may not be possible within Cuba's existing political economic institutions. In contrast, Coleman, Skogstad, & Atkinson propose an alternative to Hall's social learning model in which no institutional upheaval is needed for significant policy change to occur (Coleman, Skogstad, & Atkinson, 1996). In this "state-assisted paradigm... imperfect markets combine with unmanageable natural risks and concern for food security to give governments a large role in subsidizing agricultural production" (Coleman, Skogstad, & Atkinson, 1996). The institutions that created the policies resist change but the conditions and viewpoints that originally shaped policies are subject to change and instead of drastic institutional change, "what is needed is a distribution of power within institutions that allows actors to understand the consequences of public policies and visualize alternative policy paradigms" (Pierson, 1993, 615). This approach provides hope for significant change in Cuba's food security policies, in spite of the government's position for policy-making that is fixed in traditional political-economy institutions. The hope is the possibility for non-state actors to participate in broader policy networks that create and extend policies that continue to extend food sovereignty as a primary approach to food security, without enduring significant upheaval in state institutions or additional socioeconomic crises.

This approach challenges autonomy of state power and infers that external forces impinge on institutions of state power to create policy shifts. In order to identify the significance of non-state power, it is necessary to historically and contextually ground changing process of power (Long, 1988, 131). The historical analysis of changing policy processes provided by this study considers policies to be "windows onto political processes in which actors, agents, concepts, and technologies interact in different sites, creating or consolidating new rationalities of governance and regimes of knowledge and power" (Shore, Wright & Però, 2011, 1-2). Thus, I explore network theory in the literature in order to develop a method that connects actors and agency with the changing processes of power in food security policy in Cuba, to help answer if food sovereignty can serve as an

alternative to international food regimes for achieving food security, and what form of power-sharing relationships can be effective for achieving food sovereignty.

Network mapping is an approach that flattens processes of power in a network of actors as an alternative to following policy in a hierarchical structure, and "interface analysis" identifies nodes in the larger structure as interesting places of structural discontinuity between "normative values and social interest" (Long, 1988, 128). The significance of actors interfacing at nodes of discontinuity is that an encounter between individuals and/or different actor groups is inferred. This type of relationship was found in Premat's exploration of the encounters between Cuba's bureaucrats and non-state food producers. Premat found that social-political institutions were modified in how they interacted with non-state food producers (Premat, 2012, 2), and the state was actively involved in the expansion of non-state farms and urban gardens as a temporary measure so that people could provide food for themselves and make up for shortfalls in state provisioning. The Cuban government continued to reinforce socialist ideologies and framed policies as necessary to maintain stability in the Revolution even though Cubans were faced with an economic crisis. Social actor networks interfaced with the institutional structure to advance policy flexibility and change to meet the needs of food security.

Premat (2012) found that state power was not exerted equally in all cases. When political actors perceived that the state's ideology was being satisfied by non-state producers, an approach that supports social distribution and limits to individual wealth, there was a tendency to provide support and ignore the fact that some producers did not follow regulated practices. When it was perceived that the state's ideology was not being met, support was withdrawn and rules were more likely to be enforced. And these perceptions of whether the state's ideology was being met were variable, within the political sphere as well as within the social sphere, depending on which actors had social and/or political power, and in what local network they were situated. Moreover, the focus on wealth distribution is also described by Piñero Harnecker, who found that the Cuban Government's focus "on wealth distribution rather than on the nature of social relations"

(Piñero, 2014, 117) hinders the creation of "institutional spaces" (Piñero, 2014, 120) that give more non-state control over decision-making in agriculture and food systems.

The success of Cuba's non-state enterprise is impacted by the processes of social and political powers, and "civil society and political society in Cuba do not necessarily represent autonomous, or internally homogenous, spheres of action that exist only in antagonistic relationship to each other." (Premat, 2012, 150). Rather, there is a mutual dependence, and "one must pay attention not just to conflicts that arise between [political actors and non-state producers] but to the conversations that take place among them" (Premat, 2012, 151). Those conversations occur vertically in Cuba's political hierarchy to guide the distribution of institutional knowledge and budgets, as well as horizontally between state and non-state actors to help direct where budgets are used for effective policy implementation. I consider network mapping and interface analysis to be approaches that are well suited to interpreting the historical social context of the successes and failures of food policy implementation in Cuba, because successful food systems require actors and resources that are found at the point of policy interpretation and implementation, not just at the central nodes of power in a hierarchy. Resources available from central nodes of power, such as budgets for program implementation, may be difficult to directly access from the point of implementation due to organisational culture, interagency barriers, scepticism or reliance on policy tendencies that consolidate resources and centralise power. However, the social nature of the food sovereignty approach potentially pulls in knowledge and relationships available at the points of implementation that are not readily available to central nodes of power, and network mapping can help to develop an understanding of effective power-sharing relationships for food sovereignty.

2.2 THEORETICAL FRAMEWORK

The approaches of "classical and critical political economy may help us to identify the distribution of [land, resources, and powers necessary for achieving food security], but they do little to help us understand how or why [these] are distributed in particular ways" (Busch & Juska, 1997). That is, analysis based only on the liberal economic theory of

classical political economy would require an explanation of uneven distribution as imperfections in the market. This approach is inadequate for studying a socialist system in which the government collectivises and maintains control over the distribution of resources. Alternatively, analysis based only on critical political economy would require a politically weighted explanation for uneven distribution, and this would risk that social actors disappear in the logical rationality of a political superstructure that is dominated by particular relationships between political and economic actors that dominate and use it to their advantage. Furthermore, production and distribution are determinants of consumption, but consumption is not adequately addressed in either tradition of political economy because a focus on consumption can overlook the "complex ways that power and interest can shape a provisioning chain" (Nartosky, in Wilson, 2012, 278) that characterise traditional political economies. This oversight is important in the historical analysis of Cuba's food systems because, "for the Cuban population [the food crisis was] largely experienced as a crisis in consumption" (Pearson, 1998, 245).

Food sovereignty, led by non-state actors as a counter-movement to the economic capture of state policy, is embedded in the political economy framework of food security that holds food sovereignty and food regimes as opposing policy approaches. However, both classical and critical approaches to political economy advocate for working with a common framework that uses either political or economic fields of study to explain problems of production and distribution. An analysis based in the political economy framework alone places an over-emphasis on the political and economic actors, and social actors who work to interpret and implement policies risk "disappear[ing] behind the logic of the economic system" (Oosterveer & Sonnenfield, 2012, 21). In order to answer why, despite Cuba's favourable growing environment, technical and social capacities for growing food, and political goals for becoming food self-sufficient, there has been decreased domestic food production and increased food imports, it is necessary take an approach that overcomes the limitations of classical and critical political economy. It requires an approach that questions the origins and processes of change so that knowledge can be translated into social action for change.

Granovetter describes an analytical framework that brings a network perspective to the political economy framework and gives agency to social actors and the "extent to which economic action is embedded in structures of social relations" (Granovetter, 1985, 481). Thus, the political economy framework that grounds this study is a particular theoretical framework of critical realism that collapses any dichotomy between separate political and economic structures and gives agency to social actors. This approach, described by Payne and Phillips as the *new* political economy (*n*PE) (Payne & Phillips, 2010, 4) (Also see Cox, 1981; and Gamble, 1995), combines the analyses of the political economy framework of food security with policy network analyses (Oosterveer & Sonnenfield, 2012, 21). Critical theory emerged from the Frankfurt School of Germany as a "specific interpretation of [Western] Marxist philosophy" (Corradetti, *n.d.*) that appeared during a period of radical social and political changes in Europe in the first half of the Twentieth Century. Critical theory collapses divisions between the fields of political science and economics found in traditional political economy, and incorporates sociology in an approach that "does not take institutions and social power relations for granted but calls them into question by concerning itself with their origins and how or whether they might be in process of changing" (Cox, 1981, 129).

The "critical theory presupposes a normative ideal of society that is incompatible with the individualistic premises of the liberal tradition" (Honneth, in Rush, 2004, 343) that is found in the classical political economy, and the *n*PE framework adds value to Marx's critical political economy by emphasising processes of changing power in relationships between political, economic, *and* social actors. That is, *n*PE is not merely a descriptive framework, but a normative social framework that supports social emancipation from a constraining political economic superstructure. For example, Cuba's revolutionary state sought an alternative to capitalism as a unifying system of social rationality, but attempted to solve the problem within a political economy superstructure that defined and constrained social actors. The crisis of the Special Period required a new approach to agriculture and food systems, and individual social actors revealed a possibility for changing the superstructure – to re-localise food production and establish a new system of relationships for distribution of power. The state did capitulate on some structural

aspects that allowed production to benefit individuals, but continued to strive for superstructure maintenance by also requiring a contribution to the greater social need from successful individual producers. This mixed approach continues today, but it is still unclear to what "extent that Cuban socioeconomic thought [can free] itself from the dogmas of both state socialism and economic liberalism" (Piñero, 2014, 119) to achieve a normative form of social, political, and economic rationality that supports food sovereignty.

The *n*PE framework is used in this study of Cuba's agriculture and food systems, rather than being limited to using a traditional political economy framework that uses a theoretical concept of food regime alone, because Cuba's experiences provide examples for thinking about policy development from within a political economy that guides individual action (traditional perspectives of political economy) contrasted with the success in food production demonstrated by actors that provided alternate opportunities for policy-making that comes from networks with decentralised power (*n*PE perspective). The state remains a relevant actor in the *n*PE framework, but an integrated analysis of the processes of power between various actors complements the traditional political economy by emphasising "the mutual dependence of agency and structure, and rejects the concept of structure as constraint" (Gamble, 1995, 524).

The *n*PE framework is used to comprehend Cuba's food systems as an integrated system of policy, economy, and society with opportunities for political, economic, and social actors to influence the future of national food security in Cuba. Processes of power can be located in actor networks, and these networks have changed over time to give measurable and quantifiable results in Cuba's food production, distribution, and consumption. 'Power' is an ambiguous term, but in this study the concept refers to a dichotomy of 'controlling' (power over) and 'constructive' (power to) powers (Moore, Rakner, Gould & Unsworth, 2005, 8). One is a liberal view that considers "institutional/state power primarily as a (potential) threat to the well-being of members/citizens, and define good governance primarily in terms of legal, constitutional and other arrangements that protect against this threat, by limiting institutional/state power. [Liberals] are worried about the

controlling use of power…" (Moore, Rakner, Gould & Unsworth, 2005, 9). The second is a 'collectivist' view that considers "the state (and other authoritative organisations) primarily as a means of aggregating power and resources that may be used for the collective good. [Collectivists] view the weakness of government – manifested as disorder, vulnerability to external threat, or failure to provide public services – as the prime potential problem. Collectivists therefore tend to interpret good governance in terms of arrangements that promote the coherence and effectiveness of the state and other organisations. They warm to terms like *authority, order,* and *capability*. They emphasise the need for more state power, of the *constructive* kind" (Moore, Rakner, Gould & Unsworth, 2005, 9).

How power is organised between actors characterises different policy networks that influence policy tendencies and successes. This study characterises the organisation of policy networks during periods of variability in food security since the beginning of the Revolution and looks for social, political, and economic aspects that help to answer the questions: can food sovereignty serve as an alternative to international regimes for food provision? What form of power-sharing relationships can be effective for food sovereignty?

Another important aspect of network analysis is the acknowledgement that nature is not passive in agriculture. Globalisation tends to support a perception of food from nowhere that does not necessarily require nature. Rather, natural limits are modified to accommodate industrial agriculture "through the creation of the massive mechanical, chemical, biological, and scientific infrastructure" (Busch & Juska, 1997, 691). Food is produced by industrial agriculture as a commodity that competes for agricultural resources that also produce non-food commodities. As a result, food systems too have become more global, and edible products have become more homogenous through processing and imposition of market standards. These two points are important in Cuba's context, because recent policies indicate a desire to "develop a sustainable agriculture using integrated management of science, technology and environment… (ANPP, 2016, Guideline 156) and to apply "quality management systems in accordance with established

norms and the requirements of customers, to ensure, among other objectives, the food safety" (ANPP, 2016, Guideline 172). However, systems are composed of its constituents and the relationships between them, including natural constituents, and agriculture and food systems converge when the distance between the farmer and consumer is closed and food is perceived as food from somewhere. Food sovereignty requires the use of agroecological principles, and the network approach used in this study helps to identify how relationships of power can be organised to work within natural limits and provide sufficient amounts of safe, nutritious food.

The *n*PE framework that grounds this study is a novel approach to analysing the inter-relational aspects of food provisioning in Cuba by bringing together the contrasting political, economic, and social theses of previous studies. The existing literature contains contrasting views that praise the country's achievements in obtaining food security while at the same time describing the country as being overly reliant on imported food. The literature also describes how Cubans were able to mitigate the effects of hunger through the Special Period by engaging in highly productive, non-state agriculture that used significantly less agrochemicals and other inputs, while at the same time being described as having a population that lacks proper resources and other supports to become food self sufficient. These dichotomies converge when Cuba's agriculture and food systems are viewed through a *n*PE lens constructed from critical theory to critique the "simple planning models that assume a three-step process of policy, implementation and outcomes" (Long, 1988, 132) and "stands apart from the prevailing order of the world and asks how that order came about" (Cox, 1981, 129). This approach recognises "the mutual dependence of agency and structure, and rejects the concept of structure as constraint" (Gamble, 1995, 524) and reveals that "policy is transformed during implementation" (Long, 1988, 132) by actors that interface with structure.

CHAPTER 3: METHODOLOGY AND METHODS

3.1 METHODOLOGY

This study of Cuban food security uses a broader analytical framework than what is usually expected from a traditional political economy (Oosterveer, 2012). It also uses a network perspective that includes an analysis of the origins and processes of changing power within policy networks that include non-state actors who coordinate their activities in relation to flows of capital at the local level. Non-state food producers in Cuba demonstrate a capacity for self-sufficient food security, and their success led to greater influence in policy development, interpretation, and implementation. However, the historical record of the processes of power shows that macro-level policy tendencies for centralised control of national agriculture and international trade of agricultural commodities impacts micro-level decisions of non-state food producers. These tendencies illustrate a serious trepidation of the state in embracing innovation that ultimately limits the national potential for non-state food producers to contribute to the social, economic, and political stability of sovereign food systems.

A historical analysis of Cuba's policy-making and implementation through different eras of policy networks is aided by qualitative data on food policy and actor networks found in scholarly works, government policies, and literature produced by non-state organisations. The qualitative data are linked to quantitative data found primarily in resources provided through the FAO that describe the average consumption of RDDNs from different sources of food, and food types. These linkages illustrate measurable connections between the origins and processes of changing power within policy networks and effectiveness of various policy approaches for achieving food security. The illustration has potential significance for Cuba's policymakers who must make crucial choices.

3.2 METHODS

Quantitative methods are used to create various time series plots of food security, measured as the average annual percent of the RDDNs consumed per person in Cuba from 1961 to 2013 form different sources and types of food. Qualitative methods are used

to describe the various policy network types active over this period, and the level of policy development in phases of growth, maturity, collapse, and renovation. The result is a historical overlay that reveals correlations between policy networks and different levels of achievement of food security. This illustrates the changing approaches to food security in Cuba, and what forms of institutional relationships are most effective at achieving food security through a food sovereignty approach.

3.2.1 QUANTITATIVE METHODS

The FAO describes indicators of food security that are classified along four dimensions: availability, access, utilization, and stability (FAO, 2017). However, quantifiable metrics on the effectiveness of various policy approaches to national food security are not provided. In this study, quantitative data that characterise the dimensions of food security are taken from the FAOSTAT database and used to illustrate, in quantifiable metrics, the various approaches to food security.

There are challenges to ensuring quality assurance and quality control of data for any database, especially a global dataset like FAOSTAT that covers multiple decades and variables in food production, distribution, and consumption. However, the FAOSTAT provides a consolidated source of standardised reporting that minimises errors inherent to compiling information from multiple databases. The data used in this study include: annual production of crops and primary livestock grown for food, differentiated by food types provided in the FAOSTAT Commodity List (FCL); dietary data in the form of annual consumption per capita of food energy, fat, and protein from different food types; trade data on the import of fertilisers, import and export of food, and annual production of sugar cane and other key agricultural commodities that serve as economic indicators; and demographic statistics to calculate per capita values and correct for population growth.

One dimension of food security is ‘availability,’ which is affected by food production, import, and export. Cuba’s production data are retrieved from the FAOSTAT “Production - crops” database, and are restricted to crops and livestock that are classified as food according to the FCL standard for food items. Crops of agricultural commodities

that do not significantly contribute to Cubans´ principal food requirements are excluded from the total crop production values, and the agricultural commodities sugar cane, tobacco, and coffee are used separately as economic indicators. The result is an estimated annual production of food crops. Production data for meat sources that are significant to the Cuban diet are retrieved from the FAQSTAT "Production - livestock primary" database. Honey, animal hides, and meats with minimal production values are excluded. Data on quantities of food imported and exported by Cuba are taken from the FAOSTAT "Trade – crops and livestock products" database.

Food sovereignty is a self-sufficient approach to food security that focuses on production of "healthy and culturally appropriate food" (La Via Campesina). For the purposes of determining what level of food security is achieved through food sovereignty, CAFs are identified, from the food data described above, as traditional foods important in the Cuban diet that are grown for domestic consumption, usually following traditional methods of low input agriculture (USDA, 2008, 42). Descriptions for the food types used in this study, including those identified as CAFs, are given in Annex 1.

The 'healthy' aspect defined by food sovereignty is measured by dietary needs of, "daily per capita consumption of kilocalories, proteins and fats" (Diaz, 2014, 162). Dietary needs vary depending on a person's age, weight, activity level, and other factors (Alvarez, 2015, 5; Martín *et al.*, 2001, 10; Porrata, *et al.*, 2009, 53), and for this study the recommended daily requirements for each Cuban are assumed to be 2,500 kcal of food energy, 55 grams of fat, and 75 grams of animal and vegetable protein (Porrata, *et al.*, 2009, 53). Data on the supply of dietary needs are retrieved from the FAOSTAT "Food Balance – food balance sheets" database and imported into Microsoft Excel.

The food security dimension of 'access' is linked to economic and social policy. The dietary needs for Cuba are provided through policy approaches with an inclination to either trade of edible agricultural commodities, domestic production of food, or a combination of both. To determine the impact of food production and trade on the economic and social access to dietary needs, the food production, import, export, and dietary needs data are imported into Excel, and the mathematical and graphing tools

provided in Excel are used to calculate indices that characterise the annual levels of national food security achieved through different levels of production and trade of CAF and non-CAF foods. The general level of national food security is represented by a food availability index (FAI) that represents RDDNs consumed from all food types and sources. What level of food security is achieved by RDDNs obtained from all domestically produced food sources are represented by a food productivity index (FPI). Finally, the level of food security that is achieved from domestically grown, culturally relevant food is represented by a food sovereignty index (FSI). These separate indices are used to contextualise the level of food security achieved through approaches inclined to trade-biased food regimes or production biased food self-sufficiency. An index value of 1.0 is equivalent to 100 percent of RDDNs being met, and food security is fully achieved through either approach when an index value of 1.0 or greater is calculated. Food sovereignty is a particular form of food security, with a scope that is limited to domestically grown, culturally appropriate foods. Food sovereignty is achieved when the FSI is calculated to be 1.0 or greater.

The food availability index is the percentage of the recommended daily fat, calories, and proteins available per person from the total annual food supply produced in Cuba, plus imports, less exports. The percentages of these RDDNs available through this approach are averaged together to calculate a national FAI for each year of the study period (Equation 1).

Equation 1: Food Availability Index (FAI)

(a) $FAI_{Fat} = (g/person/day)/55\ g$

(b) $FAI_{kcal} = (kcal/person/day)/2{,}500\ kcal$

(c) $FAI_{Protein} = (g/person/day)/75\ g$

(d) $(FAI_{Fat} + FAI_{kcal} + FAI_{Protein})/3 = FAI$

An indicator of food security being achieved from nationally produced foods is measured as a self-sufficiency ratio (SSR) (Equation 2) (Clapp, 2015; FAO, 2012).

Equation 2: Self-Sufficiency Ratio (SSR)

SSR = National Production x 100 / (National Production + Imports – Exports)

However, The SSR alone can be misleading about the effectiveness of domestic food policy. That is, the SSR is a ratio of the available food that is produced nationally, and does not determine whether or not or these foods provide sufficient amounts of RDDNs. For example, when there were inadequate supplies of food in Cuba during the Special Period, domestic food production made up a greater portion of the food that was available and the SSR indicates that the country had become more food self-sufficient. However, the percentage is calculated from a smaller absolute value of food available and Cubans were, in fact, food insecure. To overcome this limitation of the SSR, the FAIs for calories, fat, and protein are multiplied by the SSR to give the ratio of RDDNs provided by food that is produced nationally. The result is a FPI for calories, fat, and protein that are averaged together to give a national FPI (Equation 3). The result demonstrates that the amount of daily food energy, fat, and protein from domestic food are found to have declined in terms of dietary needs being met during the Special Period (Figure 2).

Equation 3: Food Productivity Index (FPI)

(a) $FAI_{Fat} * SSR = FPI_{Fat}$

(b) $FAI_{kcal} * SSR = FPI_{kcal}$

(c) $FAI_{Protein} * SSR = FPI_{Protein}$

(d) $(FPI_{Fat} + FPI_{kcal} + FPI_{Protein})/3 = FPI$

Finally, the concept of food sovereignty is quantified. Food sovereignty is a form of food self-sufficiency and is calculated as the percent of the recommended daily fat, calories, and proteins from culturally appropriate foods (CAFs) that are produced nationally and are culturally important in the Cuban diet. (Equation 4).

Equation 4: Food Sovereignty Index (FSI)

(a) $FAI_{Fat(caf)} * SSR_{(caf)} = FSI_{Fat}$

(b) $FAI_{kcal(caf)} * SSR_{(caf)} = FSI_{kcal}$

(c) $FAI_{Protein(caf)} * SSR_{(caf)} = FSI_{Protein}$

(d) $(FSI_{Fat} + FSI_{kcal} + FSI_{Protein})/3 = FSI$

The difference, when FSI is subtracted from the FPI, is the average amount of RDDNs available from domestically produced, non-CAF foods (Equation 5).

Equation 5: RDDNs from nationally produced, non-CAF foods

FPI - FSI = RDDNs from nationally produced, non-CAF foods

3.2.2 QUALITATIVE METHODS

State actors have varying degrees of power to develop policies, and the success of those policies often relies on interpretation by non-state actors with varying degrees of power to influence policy-making and implementation. State and non-state actors engage "where structural discontinuities, based upon differences of normative values and social interest, are most likely to be found" (Long, 1988, 128), and network analysis is an interpretive method that investigates relationships to describe the differentiation of controlling and constructive powers between state and non-state actors that determines policy outcomes.

Qualitative data from published policies, laws, scholarly works, and other literature produced by state and non-state organisations and are collected and classified to identify key actors and factors that impact the success of food policy networks in Cuba. Government and non-government interests are organised between state and non-state actors, and the level of organisation between them characterises different forms of "policy networks" (CERMES, 2006). Actors are essential elements of policy networks, and if a particular actor comes to have no effective power, the network can take a different form. A statist network, for example, is characterised by a high level of government organisation relative to low levels of organisation among non-state actors. In this type of network, technical and policy expertise, and resources are concentrated in the state sector that follows a hierarchical policy model for policymaking. In other forms of policy networks that have high organisation of non-state sectors, the network can either be clientele pluralist, in which state organisation is low, or a corporatist network in which state organisation is also high. Potential forms of policy networks are summarised in Table 1 (CERMES, 2006).

		State Organisation	
		Low	High
Non-state Organisation	Low	**Pressure Pluralist**: low cooperation between interest groups and state, and competition between interest groups for the state's attention.	**State-directed**: resources, and technical and policy expertise are concentrated in the state sector. Hierarchical model for policymaking.
	High	**Clientele Pluralist**: Non-state groups develop consensus and pressure the state.	**Corporatist**: more than one competing and capable non-state actors that influence the state. Variations include state attempts to maintain control over the policy agenda (state corporatism), or societal driven spontaneity for cooperation (Societal corporatism) (Hazlehurst, 2001).

Table 1. Forms of policy networks based on level of organisation in and between state and non-state actors.

The classifications of policy networks collected from the published works described above are used to create a chronology of policy networks based on the level of organisation in Cuba's state and non-state actors. Time series plots of food security indices from the years 1961 to 2013 (the first year that data are available, and the most recent year that dietary data were available at the time this study was done) are overlaid on the chronology of policy networks to characterise the level of food security achieved during different eras of policy networks (Figure 2). The overlay of quantitative and qualitative data also identifies phases of policy development that are marked by significant events. The findings can inform the future implementation of official agricultural and trade policies in Cuba to support food sovereignty.

CHAPTER 4: FINDINGS

For this study of national food security in Cuba, data on the annual average daily consumption of calories, fat, and protein from the various foods in the Cuban diet are retrieved from the FAO's food database (FAOSTAT) and are used to calculate time series of the annual average consumption of RDDNs from imported and domestically grown foods from 1961 to 2013. Domestically grown foods are further differentiated between CAFs, which are "considered traditional crops grown in traditional ways for domestic consumption" (USDA, 2008, 42), and non-CAFs. These time series are overlaid on a chronology of food policy networks, based on the level of organisation between state and non-state actors. The results demonstrate a relationship between the different forms of food policy networks and the level of RDDNs consumed from imported foods or domestically grown foods (Figure 2). The findings are used to describe what form of food policy networks and policy approaches are effective at reducing exposure to volatile global food markets and restoring local capacity to grow and access culturally appropriate food. The eras of food policy networks found in this study are similar to three periods described by Febles-González, Tolón-Becerra, Lastra-Bravo, and Acosta-Valdés, who described "well-differentiated production models or systems… in three key stages or chronological periods of Cuban agricultural policy" (Febles-González *et al.*, 2011, 723) over the twenty-five year period of their study (expansion of the Green Revolution, from 1984 to 1991; the Special Period, from 1991 to 1996; and Reanimation of the Economy, from 1996 to 2007). Their work lends support to the concepts presented here for the relationships between policy networks and the different means of achieving national food security.

Beginning in 1969, Cubans consumed 100 percent of RDDNs or more (FAI of 1.0 or greater), achieving status as a food secure nation, and only experiencing an interruption in this status from 1991 to 1997 (Figure 2). In fact, the FAI recovered from a low of 81 percent experienced in 1995 so that by 2013 Cubans on average consumed 126 percent of RDDNs, matching the highest level of food security achieved previously in 1985.

However, the recovery of the FAI is marked by a key difference in how daily dietary needs are provided at the peak level of food security in 1985 and in 2013.

One approach to achieve national food security is to rely on export and import of agricultural commodities, including food, and this was the predominant approach in 1985. Another is to rely on self-sufficient production of food for domestic consumption, and this was the predominant approach in 2013. Moreover, food sovereignty is an approach to self-sufficient food security that provides RDDNs from CAFs, which tend to be grown on smaller farms and using significantly fewer external inputs of agrochemicals, machinery, and other technologies used in industrial agriculture. The percentage of RDDNs available from domestically grown, CAFs, indicated by a food sovereignty index, increased from 24.1 percent in 1985 to 59.3 percent in 2013 (Figure 2). The availability of RDDNs from non-CAFs, which tend to rely on imported nutrients and other agricultural resources, declined, as did the amount of RDDNs from imported foods (Table 2).

	Percent of RDDNs from:			
	Total sources (FAI)	Imported food	Non-CAFs	CAFs (FSI)
1985	126	42.2	59.4	24.1
2013	126	34.2	32.2	59.3

Table 2. A comparison of the percentage of RDDNs in the Cuban diet obtained from various food sources in 1985 and 2013.

This difference correlates with a change in social and political approaches to agriculture and food systems that were necessitated by the economic upheaval that occurred in Cuba with the collapse of trade with the socialist block in Eastern Europe. Prior to the collapse, Cuba participated in a socialist food regime that followed the rules and decision-making process established for its participation in trade with the socialist block. The bulk of productive land was under state control; the state made decisions on investments, production, and distribution; and the majority of the labour force consisted of state

workers. In fact, "by 1989, 30 percent of agricultural land was devoted to a single export crop, sugarcane, which generated 75 percent of export revenues, while 57 percent of all food was imported" (Rosset and Benjamin, 1994, in Rosset, *et al.* 2011, 165). Following the collapse, the imports of agrichemicals and production of commodity crops declined significantly (Figure 3). Curiously, the national production of food crops increased even though the import of agrichemicals declined. Closer examination reveals that the majority of the increase in domestic food production was is in CAFs, whereas production of non-CAFs declined (Figure 3). The consumption of RDDN's from CAFs increased also (Figure 2).

Achieving food security requires coordination between various state and non-state actors, and when the food security time series plots are overlaid on a chronology of changes in the organisation of state and non-sate actors in food policy networks, correlations between variations in the food security indices and policy network organisation are made in three eras. Furthermore, using Holling's theoretical perspective of adaptive renovation cycles (Holling, 1986), policy development appears in phases of growth, maturity, collapse, and renovation. These phases are marked by significant social, political, and/or economic events that affect agricultural policy. For a tabulated description of Cuba's eras of agriculture and food policy network organisation and periods of policy development, see Annex 2.

The start of the Revolution marks the beginning of the first era of policy network organisation. This era, from 1959 to 1989 (note that data are only available from 1961 in FAOSTAT), is characterised by a state-directed policy network with a high level of state organisation and low level of non-state organisation. Key actors initially include the Ministry of Defense, National Institute of Agrarian Reform (INRA) and ANAP. These actors exercised a collectivist approach for aggregated power and resources to improve the common good, but also exercised the controlling form of power to achieve state objectives, as demonstrated through the state's authoritative rule over a planned economy. Resources, technology, and policy expertise were concentrated in the state sector with a hierarchical model of policymaking and extension that focused on

nationalisation and reindustrialisation of agriculture. Key policies were designed to implement social-political reforms, nationalise foreign-owned agricultural assets, break from capitalism, industrialise, and diversify the economy. The average percentage of total RDDN's consumed during this era, represented by the FAI, was 108 percent (maximum of 126 percent in 1985, and a minimum of 81 percent in 1961) (Figure 2). However, the average percentage of RDDNs consumed from CAFs during this era, represented by the FSI, was only 20 percent (maximum of 24 percent in 1985, and a minimum of 14 percent in 1966).

Policy reforms during the first era occur in three periods of policy development that follow Holling's theory of adaptive renovation phases. The first, from 1959 to 1963, models a phase of renovation in agricultural policies to begin the process of becoming food self-sufficient. At the Revolution, the leadership promulgated the first *Law of Agrarian Reform* that granted land ownership to peasants that were previously land renters, in privately owned cooperativas de créditos y servicios (CCSs) and to limit the size private landholdings to a maximum of 400 hectares. The leadership also established the INRA, led by military leaders, and created the ANAP. The government also extended 58 million pesos of credit to the small farmers that make up the ANAP. During this period, the average RDDNs consumed from CAFs was 24 percent. The RDDNs from imported foods increased, as did RDDNs from non-CAF foods (Figure 2).

The beginning of the second period, from 1963 to 1976, is marked by the promulgation of the *Second Law of Agrarian Reform* that nationalised agricultural estates with greater than 67 hectares. This was a phase of growth in socialist policies and industrial agriculture. The level of RDDNs from CAFs reached its lowest values during the early part of this period, falling to as low as 14 percent in 1966. The FSI did recover to a high of 25 percent in 1974 (Figure 2), but only averaged 20 percent during the period.

The third period, a phase of policy maturation, begins with the constitutional reforms of 1976, and extends to 1. It is during this period that the functions of the INRA were transferred to a new Ministry of Agriculture, and the first Agriculture Production Cooperatives (CPAs) were established. The supply of RDDNs from CAFs remained

relatively steady at the average of 21 percent for this period. RDDNs from domestically produced non-CAFs and food imports increased (Figure 2).

The second era of policy network organisation, from 1990 to 2003, aligned with the collapse of trade with the USSR. The era is characterised by pluralist networks that formed in response to social, political, and economic instability. The first period of the second era, from 1990 to 1997, occurred during the Special Period in Time of Peace in which the previously established economic and industrial agriculture policies failed. Because state-led industrial agriculture was ineffective without necessary inputs, and non-state agriculture was not highly organised during the previous era, the organisation of power in and between both state and non-state actors was initially low, forming a pressure pluralist network.

Individuals and households increased their dependency on non-state agriculture to make up for shortfalls in state provisioning. The immediate response was "to survive the hardest times through the return of the people to the land, the use of animal traction, biological pest control methods, and input substitution, in which alternative inputs are substituted for farm chemicals" (Machín *et al*., 2013, 23). Agriculture that relied on imported nutrients, fuels, and other supplies was substituted with low-input farming, and methods that reduced fuel use in both farming and food distribution. In addition, Cubans substituted imported food and non-CAF food crops that depended on imported nutrient inputs with CAFs. A result is a sharp increase in the consumption of RDDNs from readily available CAFs that were not immediately affected by the loss of the intensive methods of industrial agriculture, such as bananas (USDA, 2008, 43), and a sharp decrease in the consumption of RDDNs from non-CAFs and imported foods (Figure 2). During the input substitution period of 1990 to 1997, the percent of RDDNs consumed from non-CAFs declined from 58 percent in the previous period to 34 percent, RDDNs from imported foods declined from 42 percent to 29 percent, while RDDNs from CAFs increased from 20 percent to a high of 34 percent in 1996. Overall consumption of RDDNs from all sources was inadequate during this period (average FAI of 93 percent), and Cuba was considered to be food insecure.

There was always some form of private agricultural activity in Cuba, but this activity was considered to be non-significant in the centrally planned economy and perceived to be distant from the state (Premat, 2012, 2). However, the non-state sector gained controlling power over food systems by responding quickly to the crisis to establish and expand private agriculture, develop agroecological practices, and transfer knowledge of those practices. Input substitution was replaced with the extension of agroecology (Machín *et al*., 2013) during a phase of renovation from 1998 to 2003. The MACAC and GNAU were launched in 1997, and the permanent use of agroecological principles in rural settings was put into practice, and permaculture in urban settings. The average total consumption of RDDNs during the period increased over the previous period, to 101 percent. The majority of gains are measured in the intake of RDDNs from CAFs, which climbed steadily from 40 percent in 1998 to a high of 62 percent in 2004 (average of 53 percent during the period). These RDDNs are related to an increase in production of CAFs (Figure 4) like "starchy root crops (viandas) like the boniato (sweet potato) [yams], potatoes, and cassava" (Altieri, *et al*., 1999, 139); plantains (USDA, 2008, 43); mangoes (USDA, 2008, 44); tropical fresh fruits nes (USDA, 2008, 45); papaya (USDA, 2008, 46); pineapples (USDA, 2008, 46); and poultry (USDA, 2008, 49). The RDDNs from these sources tended to replace the loss of RDDNs from non-CAFs, like cows' meat and milk (Figure 5).

Cooperation for the rapid development and extension of agroecological principles and practices during this period required a high level of organisation between non-state actors, forming a clientele pluralist network characterised by low organisation in the state and high organisation in non-state actors. The increase of controlling power in the non-state sector pressured the state to react. The state came to view non-state agriculture as an instrument for regaining constructive powers. This was accomplished by reframing non-state agriculture as being essential for maintaining the system of "socialist agriculture" (Valdés Paz, 2011, 84) built by the Revolution. In 1993, the state created UBPCs to encourage former workers in state-led industrial agriculture to expand food production in cooperatives that are linked to the state. Under this arrangement for sharing power and policy influence with non-state producers, non-state actors exercised greater autonomy

and controlling power in the management of agriculture, tended toward low-input practices to grow foods relevant to the island's ecology and culture, and had greater influence in defining local food systems. Furthermore, the state gained constructive power by supporting non-state actors that satisfied the socialist objectives of the state.

This approach is characterised by the state downsizing its workforce and redirecting it into cooperatives, and the non-state sector continuing to extend agroecological principles. This arrangement created opportunities for non-state sectors that extended into a third era of policy network organisation between a highly-organised state and non-state actors who also have significant organisation and influence. However, policy tendencies for hierarchical control of a planned economy remain, and these impede the maturity phase of food sovereignty policies in Cuba. This is seen in the variability of production of CAFs, and an increase in food imports in a third era of economic diversification, from 2004 to 2013 (Figure 2).

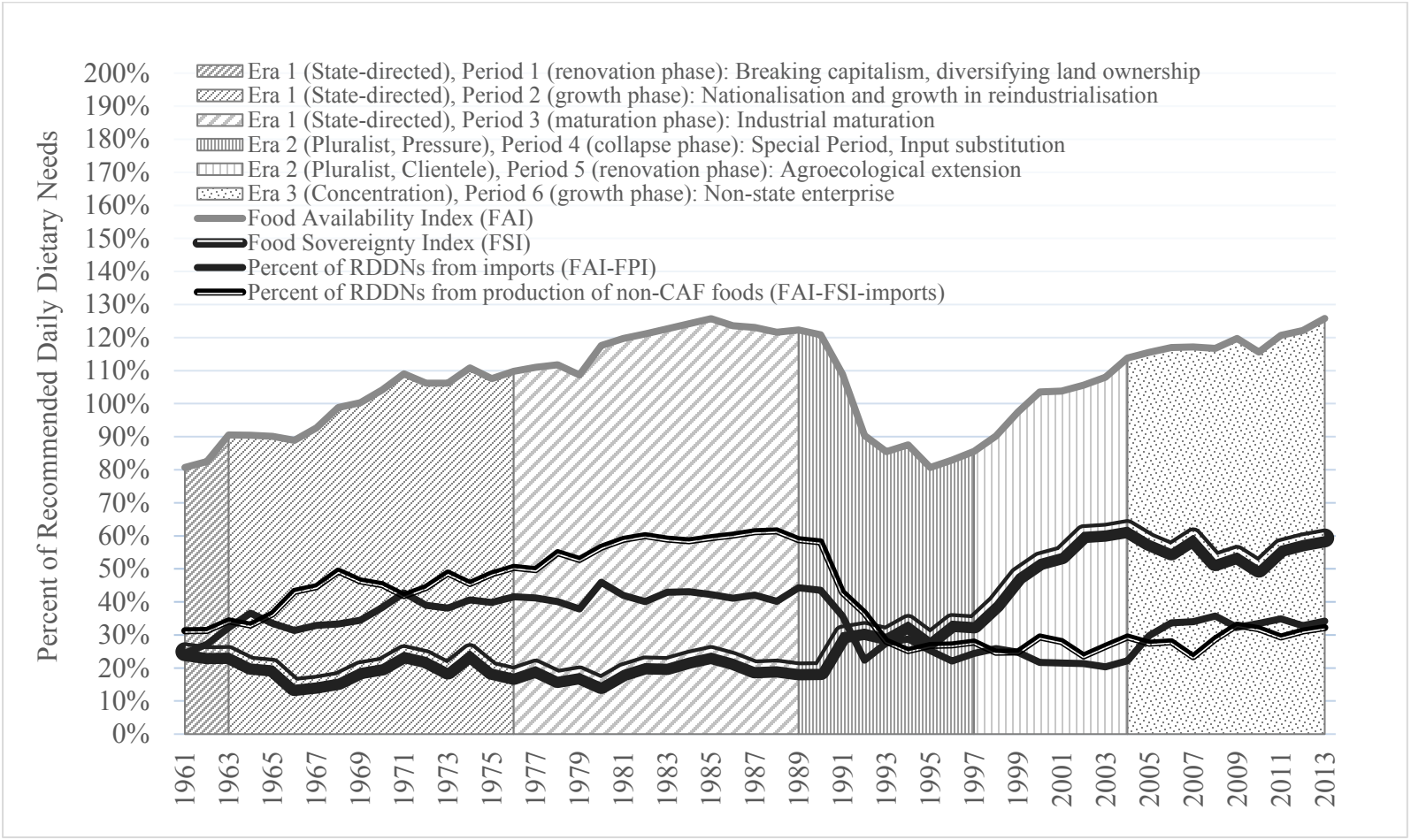

Figure 2. Percent of RDDNs in different eras of food policy networks and phases of policy development.

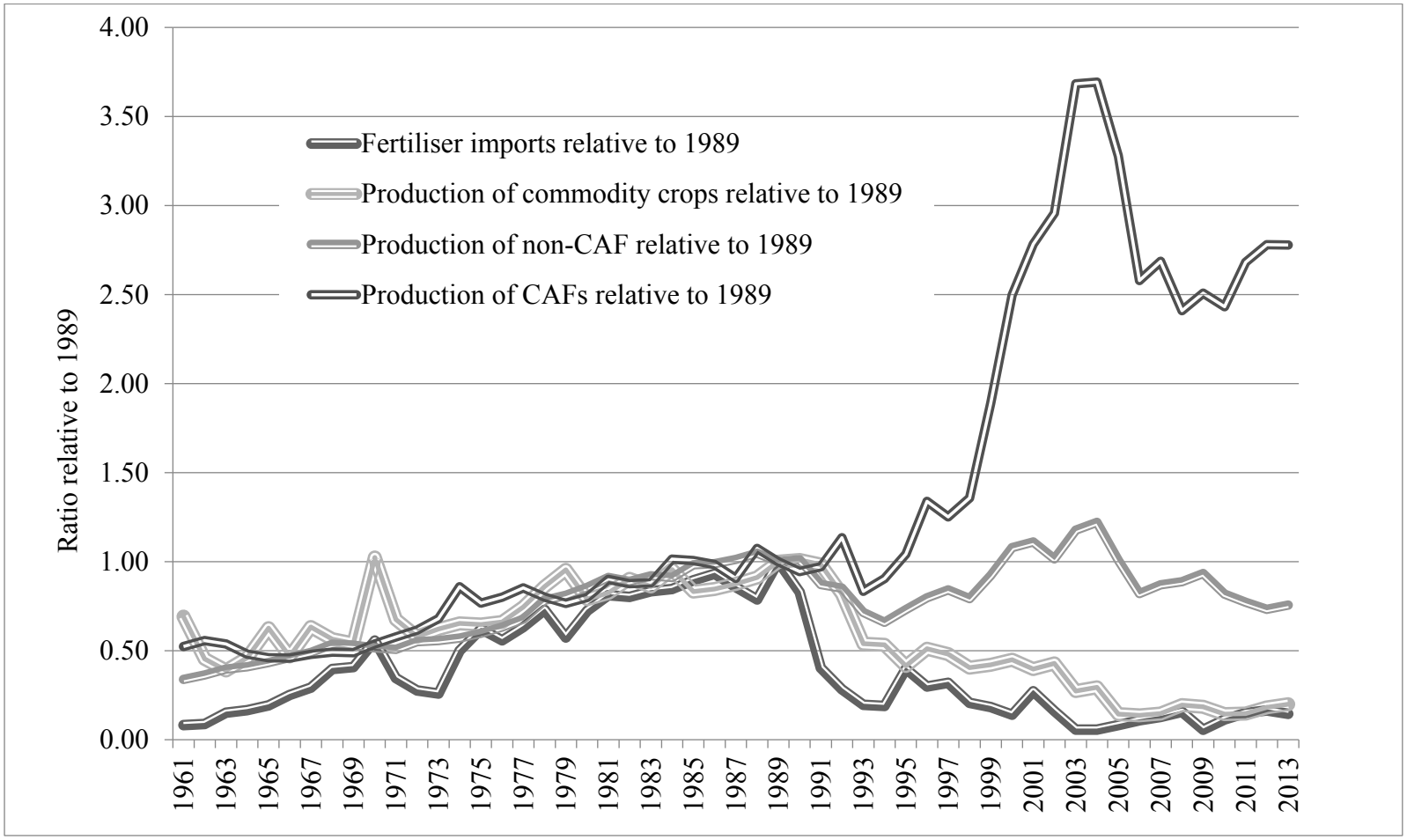

Figure 3. Cuba's production of food and commodity crops, and import of fertilisers relative to 1989

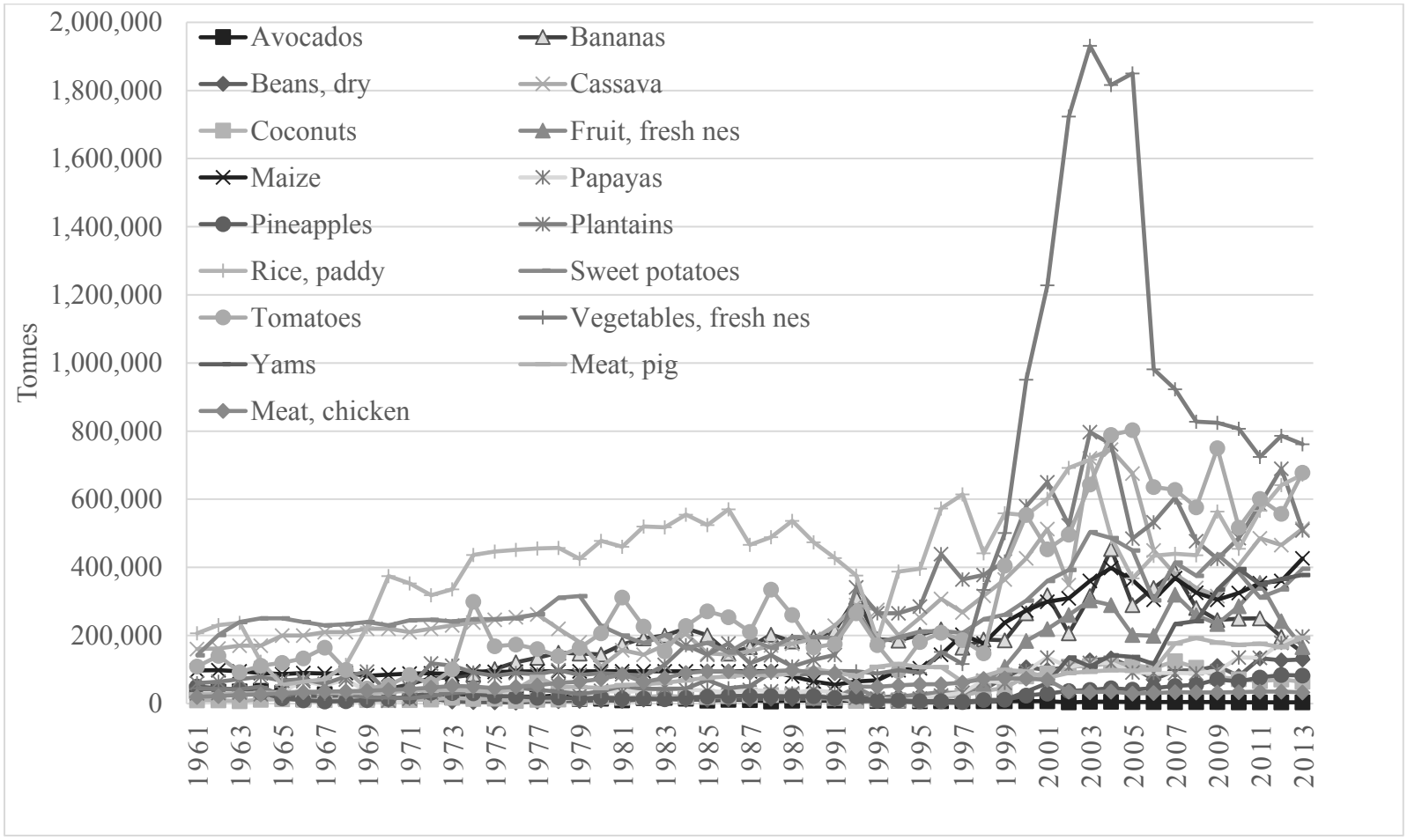

Figure 4. Production of culturally appropriate foods.

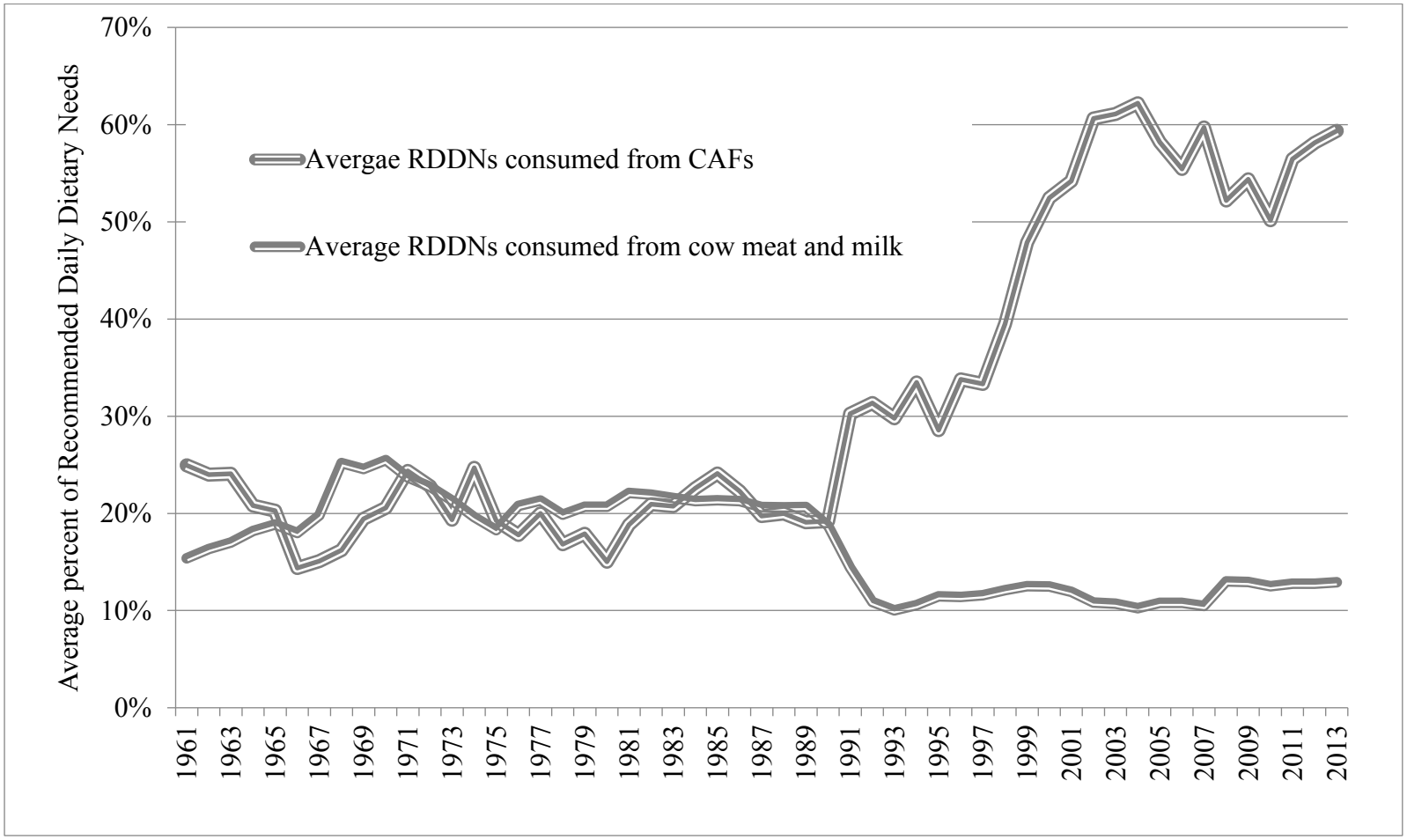

Figure 5. Dietary changes over time from selected foods.

CHAPTER 5: DISCUSSION

The main finding of this study on Cuban food security is that there is a vulnerable relationship between food policy networks, characterised by the level of organisation in state and non-state actors, and the annual average consumption of recommended daily dietary needs (RDDNs) from either imported or domestically grown foods, particularly from domestically grown culturally relevant foods (CAFs) that are used as an indicator of food sovereignty. That is, food sovereignty is significantly impacted by the Cuban leadership's tendency to focus on the distribution of capital associated with agricultural commodities produced for external trade rather than on the nature of social relations with non-state actors who grow CAFs. This finding is helpful for answering the following questions: Can food sovereignty serve as an alternative to institutionalised agriculture and food systems for achieving national food security in Cuba? And, what form of power-sharing relationships can be effective for achieving food sovereignty in Cuba?

Answers to these questions are important for the governance of Cuba's food system as new policies are being developed at a time of social, political, and economic challenges that result from a faltering regional trade regime with other socialist Latin American states, changes in Cuba's national leadership, and uncertain policies for normalisation of United States/Cuba relations. The state's response to these challenges so far has created a dichotomy in economic and social policies that impact reliable food systems. On the one hand, policy tendencies that seek trade opportunities and centralised ownership of agricultural resources persist. On the other hand, the state is downsizing the size of the national workforce employed by the government and is creating policy spaces for private enterprise and employment. The majority of these enterprises are involved in the production and sale of food (Piñero, 2011, 72). Both approaches are couched in maintaining the socialist ideals of the Revolution, but with significant differences. The former approach consolidates resources and follows trends in international markets. This leaves Cuba's food systems exposed and vulnerable to international market shocks, and non-state production of CAFs in Cuba tends to decline when favourable trade opportunities present themselves. The latter approach depends on a new state narrative of

socialism that accepts private enterprise as necessary for the Revolution; however, the government's focus remains on wealth accumulation and distribution rather than on social relationships (Piñero, 2014, 117), and there are signs that there is a lack of consensus in Cuba on the adequacy of non-state enterprises to advance Cuban socialism (Piñero, 2014, 113).

The uncertainty caused by this dichotomy is a barrier to the creation of permanent policies for self-sufficient food production and leaves Cuba's food systems exposed and vulnerable to international market shocks. A new political economy is needed in Cuba that includes food policy networks that pay attention to the needs of non-state producers and consumers, giving genuine decision-making powers in policy making and resource allocation to non-state producers that follow agroecological principles. Lessons on how this can be achieved are found in Cuba's own record of social and economic development.

A chronology of the level of organisation between state and non-state actors in relation to the annual average consumption of RDDNs from various foods in the Cuban diet from 1959 to 2013 (first available data are for 1961) shows that variability in RDDNs consumed from imported food and domestically grown non-CAFs and CAFs corresponds to the balance of power between the state and non-state actors in three eras of food policy networks. The first era, from 1959 to 1989, is characterised by a state-directed policy network and centrally controlled participation in an international food regime with socialist states. The second, from 1990 to 2003, aligned with the collapse of trade with the Soviet Union and is characterised by pluralist networks with low levels of state organisation. The third era, from 2004 to 2013, is an era characterised by a corporatist policy network of capable non-state actors that have the potential to influence state power and policies in food systems. That is, domestic non-state producers are better organised and have a greater focus on food self-sufficiency; the international development community has significant influence, but is indifferent to the use of trade policies to achieve food security; and these non-state actors interact with an opportunistic state. The result is precarious growth in the non-state sector that is impacted by the state's response to international trade opportunities.

The first era described in this study, beginning in 1959 and continuing to 1989, is characterised by state-directed food policy networks. The state's rejection of capitalism and establishment of a centrally controlled economy in this era occurs in three periods, which follow Holling's theory of adaptive renovation cycles. The first period, from 1959 to 1963, is a phase of policy renovation that includes the promulgation of the *Law of Agrarian Reform* through which the state set out to take agricultural lands from the hands of capitalists and return it to Cuba's farmers. The leadership founded the INRA and appointed members of the former Rebel Army to implement reform. However, the INRA lacked the technical expertise necessary to lead the reform (O'Connor, 1968), and farmers lost the will to plant crops and till lands (Pérez, 2006). In addition, the country's agricultural infrastructure was too far embedded in global trade of sugar (Fraginals & Moreno, *n.d*.) to make a rapid change to self-sufficient farming. Furthermore, this embeddedness made Cuba's agriculture a target of the United States' leadership. The United States House of Representatives unanimously authorised President Eisenhowser to cut Cuba's quota of sugar sold to the United States (Schoultz, 2009, 124). The embargo on sugar was characterised as an effort to make the Cuban people "go hungry… and perceive the catastrophic nature of Castro's program" (Schoultz, 2009, 122). However, the USSR stepped in to buy excess sugar (Walters, 1966, 76), and Cuba negotiated trade agreements with the USSR and Eastern European Countries (Walters, 1966, 75). As a result of these combined factors, Cuba was not food secure, the average percentage of RDDNs consumed during this period was only 85 percent, but the amount of RDDNs from imported foods and domestically grown non-CAFs increased (averaging 28 percent and 33 percent respectively), and RDDNs from CAFs averaged 24 percent.

In response to low achievement in domestic agriculture during the first period, Cuba's agricultural lands were collectivised and productive resources were put to work in a food regime of economic trade relations with the USSR and other socialist countries of Eastern Europe, thus "building the foundations of a peculiar socialist agriculture" (Valdés Paz, 2011, 84). During this adaptive phase of growth in socialist food policies, from 1964 to 1976, the Cuban state was committed to trade polices in which the USSR underwrote intensive monocropping of agricultural commodities in Cuba by paying high prices for

sugar and providing machinery, fuel, and the necessary agrochemicals at low cost. The reindustrialisation and commodification of agriculture, and the renewed trade of sugar, situated Cuba's agriculture and food systems in an international food regime. This approach exposed the country to global socioeconomic factors beyond the country's borders. Although Cubans were on average consuming enough RDDNs to be considered food secure (FAI of 101 percent), Cuba's resources and workforce were predominantly allocated to industrialised production of commodities, and the capacity of local food systems to produce CAFs was diminished. Reliance on RDDNs from food imports and domestically grown non-CAFs increased (averaging 37 and 44 percent respectively), while the average RDDNs from CAFs declined during this period and was only 20 percent (reaching a low of 14 percent in 1966).

The beginning of the third period, an adaptive phase of policy maturity, is marked by the updated Constitution of 1976. The Constitution reaffirmed the state's authority over a centrally planned economy, the state's support for the individual production of small farmers who contribute to the national economy (Gobinero, 1976, Article 19), and established Agriculture Production Cooperatives (CPAs) (Gobinero, 1976, Article 20). In this scenario, small farms continued to grow food, generally CAFs, but individual production that did not contribute substantially to the national economy and continued to be considered to be non-significant and distant from the state. The annual average consumption of RDDNs from CAFs during this period, from 1977 to 1989, remained flat at 20 percent. The RDDNs from domestically grown non-CAFs increased from an average of 44 percent in the previous period, to an average of 58 percent. Consumption of RDDNs from imported food increased too, from 37 percent in the previous period to 42 percent.

The socialist food regime remained relatively stable until the second era of food policy networks, beginning in 1990. Up to then, the Cuban state assumed permanence in the fundamental structure of the political economy. In this "realist paradigm, the conception of states as unified actors with discrete purposes and policies, acting in a world that in its fundamental structure does not change" (Gamble, 1995, 522). However, the Cuban leadership encountered a new reality when the USSR dissolved causing a sharp decline in

trade, including the importation of agricultural supplies, food, and other commodities. The country entered a period of economic decline that Fidel Castro declared to be "el período especial en tiempo de paz" – "the Special Period in Time of Peace" (Castro, 1990). With the failure of food policies during this phase of collapse, from 1990 to 1997, the government experienced a crisis of production. Production of non-CAFs and agricultural commodity crops that depended on imported fuel, agrichemicals, and other intermediate resources for industrial agriculture declined significantly from 1989 levels (Figure 3). As a result, Cubans experienced a crisis in consumption. The annual average consumption of RDDNs was only 93 percent, reaching a low of 81 percent in 1995 (Figure 2).

The third order changes (Hall, 1993; Coleman, Skogstad, & Atkinson, 1996, 274) brought about by the collapse of trade with the USSR are "changes in principles and norms [that] are changes of the regime itself" (Krasner, 1983, 188), rather than "changes in rules and decision-making procedures [that] are changes within [the regime]" (Krasner, 1983, 187), indicating that Cuba had entered a second era, distinct from a food regime. During the first adaptive phase of this era, the non-state sector responded quickly to their crisis of consumption through input substitution that included an increase in tradition-based practices to grow and access culturally relevant foods. How farmers, gardeners, and former state farm workers organised themselves and interpreted polices through a fractured system of ruling relations led to a variety of outcomes. The ANAP embraced principles of agroecology, using a minimum of external inputs while significantly increasing production. Furthermore, urban gardeners followed principles of permaculture, to bring the growing environment back into reclaimed vacant urban spaces to grow food in cities, and organised into various fora (Premat, 2012) of organóponicos (raised bed farming), huertos intensivos (growing directly in the ground), parcelas (small gardens in vacant urban lots), and patios (small private lots). This led to new social relationships and increased use of agroecology practices and permaculture, and food self-sufficiency emerged as an alternative to the international food regime.

The Cuban state became aware of its weakened position in agriculture and food systems, and of the increase of power in non-state producers. The success of the state's food

polices depended on implementation work, and the need for new "power relations [beckoned to a] critical theory as [Cubans sought] to understand the opportunities of risk and change" (Cox, 1981, 130). Although the state's realist paradigm was challenged by the changes that caused the Special Period, it continued to follow policy tendencies fixed in an unchanging political economic structure characterised by "the continuity and irreversibility of Socialism… [and that] only socialism is capable of overcoming difficulties and preserve the achievements attained by the Revolution" (PCC, 2011, 5). As a temporary measure, so that people could provide food for themselves to make up for shortfalls in state provisioning while maintaining the state's socialist ideology, social-political institutions were modified in how they interacted with non-state food producers (Premat, 2012, 2). This included the state being actively involved in the expansion of non-state farms and urban gardens that were perceived to meet the state's objectives.

At this same time, and further exacerbating the challenge to the Cuban state's power in food systems, was the United State's *Torricelli Act*, that passed Congress in September of 1992 (Congress.gov), to strengthen the trade embargo on Cuba. It was a congressional act that prohibited the exportation of food and medicine to Cuba from any United States or United States subsidiary company. Private companies in the global food regime that had any association to United States finances or United States food products could not participate in trade of food with Cuba. In addition, no vessel entering Cuban waters could enter a United States port for up to 180 days after. Prohibiting trade of food to Cuba from the United States, from foreign countries that had ties with the United States, and limiting shipping companies had a three-layer effect on Cuba's capacity to import food.

The results, of first losing trade with the USSR, then having some limited trade with other countries that was subsequently shut down by the *Torricelli Act*, coupled with of the expansion of non-state power in Cuba, appears as a slight increase in imports between 1992 and 1993 that immediately levels then declines. Conversely, the FSI increased dramatically (Figure 2). In 1996, the United States Congress passed the *Helms-Burton Act* (Congress.gov, 1996), which was meant to enhance the *Torricelli Act* by punishing non-United States countries that traded with Cuba. These included Spain, Italy, Mexico and Canada. To this, many exporters and financial institutions withdrew from Cuba

totally, which further limited Cuba's capacity to import goods. Although China and Russia continued to trade with Cuba, imported foods only provided an average of 29 percent of the RDDNs during this period, down from 42 percent in the previous period. In contrast, a dramatic increase in the production of CAFs (Figure 3) and consumption of RDDNs from CAFs is seen in this period (Figure 2).

The approach of couching the success of non-state producers as necessary for maintaining the principles of the Revolution was intended to be a temporary arrangement to bolster state power, so the state supported the non-state sector, but support was not given equally in all cases (Premat, 2012). The heterogeneity that appeared in social relations further challenged the state's realist view of an unchanging structure of political economy, and non-state enterprise in agriculture received further validation by the state in an second adaptive phase. In this phase of policy renovation, from 1998 to 2003, the state reallocated agricultural resources to rebuilding domestic food production and distribution networks. The state loosened agricultural and market restrictions for small farmers of the ANAP, made urban spaces available for food gardens, and expanded the cooperative model of UBPCs that granted former state-farm workers usufruct access to state-owned land that was previously used for industrial agriculture, an action led to a new decentralised system of agricultural production (Díaz, 2014. 133).

Farmers of the ANAP, who recognised that social agency is essential to transforming food systems, leveraged their powers in newly formed social relations to create the Movimiento Agroecológico de Campesino a Campesino (MACAC), a social process to share their experiences, knowledge, and practical skills with peers as a way to increase food production and improving access to food, (Rosset *et al.*, 2011). They also joined La Via Campesina (LVC) (Díaz, 2014, 148), an international, peasant-led advocacy movement that promotes food sovereignty (La Via Campesina, 2007). In contrast to the successful transition of the ANAP to agroecological practices, former state farm workers that make up the UBPCs had difficulty transitioning to peasant farming and adopting practices of low external inputs (Rosset, et al., 2011, 166; Rosset, 1997). The ANAP, which includes private land owners of the CCSs and the CPAs, has greater autonomy from the state than UBPC, and those ANAP farmers who joined the MACAC have an

objective to change the mentality of farmers to use ecological practices (Díaz, 2014, 147). Alternatively, some of the UBPCs, which are comprised of former state workers, and over which the state retains control over inputs and outputs, have adopted agroecological practices, but their members are not associated with the ANAP nor do they participate directly in the MACAC (Díaz, 2014. 133).

A break from the socialist food regime was thrust on Cuba, and the weakened position of the Cuban state in agriculture and food systems required it to decentralise some of the management of these systems and make farm families the central actors to economic recovery. In response, Cuba's non-state food producers demonstrated a capacity to achieve high yields of culturally appropriate food using ecologically sound and sustainable methods of agroecology. The lesson to take from Cuba's response to the failed economy of industrial agriculture in this era of the country's history is that with greater autonomy for non-state food producers in democratic decision-making over scarce agricultural resources, food self-sufficiency can contribute to social and economic development and provide a significant level of food security through locally produced CAFs. This is especially true when facing punishing economic embargoes.

A third era of food policy networks, beginning in 2004, is an era of economic diversification characterised by a corporatist policy network of sometimes competing interests. These include the state's interest in seeking bilateral trade agreements with other countries, the interests of Cuba's non-state producers to have greater autonomy over sustainable food systems, and the interests of the international development community to achieve food security through sustainable agriculture that also indifferent to the role of trade. The international development community considers Cuba to be food secure, having achieved the 2015 Millennium Development Goal for food security (FAO, IFAD and WFP, 2015), to halve, between 1990 and 2015, the proportion of people who suffer from hunger. However, a new agenda for sustainable development set by the General Assembly of the United Nations has the goal to, "End hunger, achieve food security and improved nutrition and promote sustainable agriculture [by 2030]" (United Nations, 2015), and this puts pressure on Cuba to maintain its status.

The beginning of the third era is marked by the return to a focus on trade. In 2004, Cuba and Venezuela founded the regional trade alliance of ALBA, and there was an increase in international trade, including an increase in food and fertiliser imports (Machín Sosa, 2013,110) and a related increase in RDDNs from imported foods (Figure 2). Conversely, there was also a decrease in domestic food production (Figure 3) and the consumption of RDDNs from domestically grown foods (Figure 2). Furthermore, Cuba and Venezuela strengthened their trade relations with multiple programs of cooperation and exchange of experts in healthcare, education, military and security, and agricultural expertise sent to Venezuela in exchange for petroleum products back to Cuba at significant discounts. This generous discount from Venezuela was essential to free up cash that allowed Cuba to import more food on a cash basis from Brazil and the United States, as the pervious embargo would not allow credits. At this time, a decline in the FSI and an increase in the consumption of RDDNs from food imports are observed (Figure 2).

Agricultural policies continued to be important tools in Cuba's pursuit of external economic relationships for the benefit of strengthening internal social structures (PCC, 2011) and Cuba's economic alignment with the socialist state of Venezuela again turned emphasis to trade for achieving food security. However, Venezuela's economy declined, and despite a progression of statutes and policies for socioeconomic reforms in Cuba that aimed to increase domestic food production and decrease food imports, Cubans continued to experience persistent challenges for accessing sufficient daily amounts of nutritious food. The Cuban state's view of a rigid political economic structure and its centralised policy-making tendencies were again challenged by this reality, and the subsequent Economic and Social Policy Guidelines of the PCC (PCC, 2011) reveal a degree of 'critical realism' that looks for opportunities to bring about an alternate order for power distribution to achieve "transformations in [agriculture's] production base" (PCC, 2011, Guideline 179) including "a gradual decentralisation [of functions currently allocated to the state] in favour of local governments" (PCC, 2011, Guideline 178).

On paper, it appears that maintaining sovereignty over its economy and food systems are important objectives. Cuban leadership wants to minimise reliance of food imports (PCC, 2011, Guideline 177) and achieve food self-sufficiency through land reforms and

cooperative approaches that engage with small farmers. These are positive indicators for real change; however, "the linkages between food security and international trade are complex and context-specific" (FAO, 2015, 26), and this complexity is seen in the third era of policy networks in Cuba. Although Cubans consume the highest average of RDDNs from CAFs in this era, Cuba's food security is achieved through a blended approach of sustainable agriculture and international trade relationships that leaves the country's food systems vulnerable. In this blended approach, the Cuban Government's continues with its tendency to focus "on wealth distribution rather than on the nature of social relations" (Piñero, 2014, 117), and this hinders the creation of "institutional spaces" (Piñero, 2014, 120) that give more non-state control over decision-making in agriculture and food systems.

The Cuban leadership is opportunistic and is seeking bilateral trade agreements for multiple sectors, including agriculture. Therefore, it is likely that Cuba will continue to seek foreign partnerships as a means to achieve food security rather than enhancing food sovereignty systems. In this approach, the economic importance of social relationships for agricultural productivity must not be underestimated because "small farms almost always produce far more agricultural output per unit area than larger farms, do so more efficiently, and produce food rather than export crops" (Frank, 2013; Rosset, 2009, 123). A trade focus on achieving food security can potentially overlook where and how food is produced and the many negative impacts that "food from nowhere" produced in factory farming can have compared to "food from somewhere" that focuses on more localised food production that follows principles of agroecology, distribution, and consumption (Bové and Dufour, in McMichael, 2009). It also keeps vulnerability high, as changes in foreign partnerships can immediately impact food security. The country's history of agriculture and food systems infers that in order not to overlook where food is produced, how it is produced, and what food is produced, the state should move toward a new approach of having permanent policy networks that include genuine power-sharing with non-state producers; provide incentives to farm families that intensify and extend of agroecological practices; and give preference to local food markets over imported food.

Food sovereignty is a means to become food self-sufficient and achieve national food security that is closely associated with "farm families [who are] seen as key actors to be mobilised in national economic development" (Rosset, 2009, 126) as opposed to recipients of development assistance. This is a valid approach to food security in Cuba, but it is an approach that requires a "considerable cultural [and political] transformation" (Piñero, 2014, 124).

CHAPTER 6: CONCLUSION

This study explored the practical problem of why, despite the Cuban government's strategic focus on domestic agriculture as a key sector for social and economic development, and a progression of policies to boost domestic food production and minimise food imports, there continues to be insufficient domestic food production and an increased reliance on food imports. The thesis put forward to explain this problem is that policy tendencies persist in Cuba's leadership that favour international trade and centralised control of agricultural resources, and these tendencies limit the full potential of small-scale farmers to produce food, restricts domestic producers from fully participating and benefiting in the national economy, and leaves Cuba's food systems exposed and vulnerable to international markets.

The first step undertaken to explore this problem was to quantify the level of food security achieved in Cuba from 1961 to 2013 from imported or domestically grown foods. An important indicator of food security is the amount of recommended daily dietary needs (RDDNs) of food energy, fats, and proteins consumed, so the annual average RDDNs consumed in the Cuban diet was calculated and used to create time series plots of food security achieved through imported or domestically grown foods. Furthermore, the average annual RDDNs from domestically grown culturally appropriate foods (CAFs), which tend to be grown on smaller farms and using significantly fewer external inputs of agrochemicals, machinery, and other technologies, is quantified as a Food Sovereignty Index (FSI).

The second step was to create a chronology of how state and non-state actors with interests in agriculture and food systems are organised into different forms of food policy networks over this period. The time series created in the previous step were overlaid on the chronology of food policy networks (Figure 2) and it was found that changes in food security correlate with change in food policy networks. Closer examination found that food policy networks with high levels of organisation in the state correlate with a majority of RDDNs being obtained from imported food and from domestically produced non-CAFs that are typically grown using imported agrichemicals. In contrast, policy

networks with high-level of organisation in non-state actors correlate with decreased consumption of RDDNs from those sources, and increased consumption of RDDNs from domestically grown CAFs.

These findings help to answer key research questions explored in this study, which are: Can food sovereignty serve as an alternative to institutionalised agriculture and food systems for achieving national food security? What form of power-sharing relationships can be effective for achieving food sovereignty?

An answer to the first question is not conclusive in the example of Cuba. That is, the production of domestically grown food, particularly of CAFs, increased dramatically following Cuba's Special Period, but production levels and consumption of RDDNs are variable and do not meet goals for being food self-sufficient. This is related to the Cuban state's preference for a hierarchical structure of formal relationships to carry out centralised economic planning that includes agriculture, and the leadership's tendencies to seek opportunities for international trade. This approach tends to overlook the contributions of non-state food producers and limits their agency in permanent economic policies. However, the state's tendency is countered by non-state food producers who challenge the constraining concept of institutionalised agriculture and food systems. They instead emphasise the processes of change in relationships of power, and the mutual dependence between agency and structure. Many of these food producers advocate for food sovereignty as a means of building capacity for food self-sufficiency through the domestic production and trade of CAFs.

This finding provides an answer to the second question. Food security pursued through the impersonal relationships of international food regimes requires a high-level of organisation in the state to participate as a network-state in complex processes of power-sharing and negotiated decision-making. This approach does not require a recognition of where food is produced, or what type of foods supply the RDDNs, and can lead to dispossession of non-state producers and create vulnerability in food supply. In contrast, food sovereignty requires that RDDNs be obtained from CAFs grown through sustainable

farming systems. This approach localises food production, distribution, and consumption through a network of personal relationships.

As of 2013, the most recent year of data availability, Cuba is in a phase of growth in policies for non-state enterprise. These policies have not yet reached maturity, and this presents tremendous potential. However, there is a dichotomy in Cuba's economic and social policies that impact reliable food systems. On one side of the dichotomy, there is a high level of organisation and sharing of influential power between state and non-state actors in improving the country's environmental, economic, and social aspects of food production, distribution, and consumption. To achieve this, the state is downsizing the size of the national workforce employed by the government and is creating policy spaces for private enterprise and employment. On the other side, the state maintains policy tendencies that seek trade opportunities, and the centralised control of food resources. This demonstrates a serious trepidation by the state and is considered to be a serious barrier to sustainable food security.

Food sovereignty can play an important role in achieving national food security in Cuba. To do this, it is recommended that domestic food production of CAF be increased and import dependency decreased through an approach that distributes land, and decision-making authority for the use of scarce agricultural resources to non-state actors in food policy networks. These networks must be permanent and give agency to agriculture practitioners that abide by agroecological principles, and to consumers that help shape market policies that prioritise domestically produced food over imported food.

Food sovereignty policies need not contradict the Revolution's values. In fact, sovereignty over food systems enhances patriotic and nationalist goals to counter large-scale capitalist agriculture, increase agricultural productivity, and be food self-sufficient. However, trepidation towards decentralising agricultural policy innovation is found in Cuba's Updated Economic and Social Policy Guidelines of the Party and the Revolution (ANPP, 2016), and this may continue to impact independent production of CAFs. For example, Guideline 148 is to, "Continue transforming the management model, in correspondence with the increased presence of non-State forms of production" (ANPP,

2016, Guideline 148). However, this revised guideline moves away from a previous focus on relationships to "promote greater autonomy of producers [and] bring about gradual decentralisation to local governments" (PCC, 2011, Guideline 178) that is found in the 2011 Guidelines. The revised Guidelines instead focus on resource allocation to "continue developing the municipal food self-sufficiency programme, relying on suburban and urban agriculture, taking advantage of local resources and animal traction" (ANPP, 2016, Guideline 170), and asserts that "state-owned agricultural continues to be the main manager of technological development and production strategies and marketing" (ANPP, 2016, Guideline 148).

The revised Guidelines reiterate the Cuban leadership's intentions to grow a "greater supply of food destined for domestic consumption" (ANPP, 2016, Guideline 147), but there are also several references that signal the Cuban leadership's intentions to become a network state in external trade of agricultural commodities. For example, the Guidelines are intended to increase exports (ANPP, 2016, Guidelines 147, 162, 167, 168, and 171); "take into account the behaviour of prices in the international market" (ANPP, 2016, Guideline 153); to revive the production of commodities like citrus fruits (ANPP, 2016, Guideline 168) and sugar (ANPP, 2016, Guidelines 173 and 174); and to "apply quality management systems in accordance with established norms and the requirements of customers, to ensure, among other objectives, the food safety" (ANPP, 2016, Guideline 172). Although safe food is of great importance, this final example has the potential to adopt processing requirements and external market standards for homogenous edible products that can deter some traditional practices and acceptance of naturally undersized, misshaped, but otherwise healthy and safe food that is unacceptable for global markets.

In contrast to the leadership's aspirations to develop external markets, the revised Guidelines also set out to ensure increased production of "rice, beans, corn and other grains… to contribute to the gradual reduction of imports of these products and increase consumption" (ANPP, 2016, Guideline 166). These CAFs, grown in conjunction with "processes of environmental education, considering all the actors of society" (ANPP, 2016, Guideline 158), can support food sovereignty. This will occur in tension with a return to increased production of non-CAFs, primarily meat and milk (ANPP, 2016,

Guideline 164), that experienced a significance production decrease and less significance in the diet of Cubans, starting with the Special Period and continuing to today (Figure 5). The Food Sovereignty Index (FSI) developed in this study can be used to track trends of CAF production in Cuba, as new data are made available, to determine the level of food sovereignty achieved by implementation of these guidelines.

Finally, the FSI has a wider potential to move food sovereignty from being a concept to being a quantifiable achievement. It is recommended that the approach used in this study be validated by determining a historicised FSI for other countries that have experienced failures in food regimes, either through trade embargoes or other means, and that the FSI be compared to the level of organisation in food policy networks of state and non-state actors.

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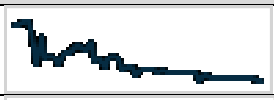
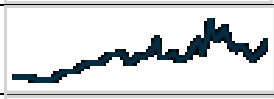
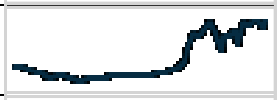
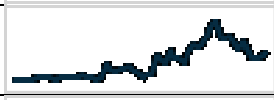
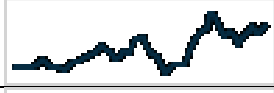
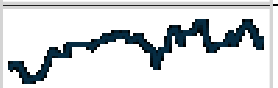
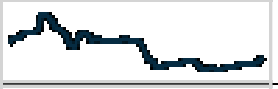
APPENDIX 1: FOOD TYPES

Food Type	FCL Code	Culturally Significant (used for calculating CAFs)	Pattern of production 1961-2013
Food Crops			
Avocados	0572	Yes (USDA, 2008, 42)	
Bananas	0486	Yes (USDA, 2008, 42)	
Beans, dry	0176	Yes	
Cabbages and other brassicas	0358		
Cassava	0125	Yes (Altieri, 1999, 139)	
Chillies and peppers, green	0401		
Cocoa, beans	0661		
Coconuts	0249	Yes (USDA, 2008, 42)	
Cucumbers and gherkins	0397		
Fruit, citrus nes[1]	0512		
Fruit, fresh nes	0619	Yes	
Fruit, tropical fresh nes	0603		
Garlic	0406		

1 The abbreviation “nes” means, “not elsewhere specified”, and according to the FAO, “are not identified separately because of their minor relevance at the international level.” (FAO, Definition and classification of commodities. http://www.fao.org/waicent/faoinfo/economic/faodef/faodefe.htm#COMG).

Food Type	FCL Code	Culturally Significant (used for calculating CAFs)	Pattern of production 1961-2013
Grapefruit (inc. pomelos)	0507		
Grapes	0560		
Groundnuts, with shell	0242		
Lemons and limes	0497		
Maize	0056	Yes	
Mangoes, mangosteens, guavas	0571	Yes (USDA, 2008, 42)	
Melons, other (incl.cantaloupes)	0568		
Onions, dry	0403		
Oranges	0490		
Papayas	0600	Yes (USDA, 2008, 42)	
Pineapples	0574	Yes (USDA, 2008, 42)	
Plantains	0489	Yes (USDA, 2008, 42)	
Potatoes	0116		
Rice, paddy	0027	Yes (Váquez, 2010, 157)	
Sorghum	0083		
Sweet potatoes	0122	Yes	
Tangerines, mandarins, clementines	0495		

Food Type	FCL Code	Culturally Significant (used for calculating CAFs)	Pattern of production 1961-2013
Tomatoes	0388	Yes (Díaz, 2014, 143)	
Vegetables, fresh nes	0463	Yes. Includes lettuce, peppers, chards, broccoli (Díaz, 2014, 143)	
Watermelons	0567		
Yams	0137	Yes (Altieri, 1999, 139)	
Yautia (cocoyam)	0135	Yes (Tuber, yam)	
Primary livestock			
Eggs, hen, in shell	1062		
Meat, cattle	0867		
Meat, chicken	1058	Yes	
Meat, pig	1035	Yes	
Meat, sheep	0977		
Milk, whole fresh cow	0882		
Export commodities			
Coffee, green	0656		
Sugar cane	0156		
Tobacco, unmanufactured	0826		

APPENDIX 2: POLICY ERAS AND PERIODS

ERA 1: 1959-1989
Socialist Food Regime
Average FAI of 107.6 percent

	Percentage of RDDNs (year)		
	Non-CAFs	Imported Foods	CAFs
Mean (1961-1989)	49.2	38.3	20.2
Min	31.3 (1961)	24.5 (1961)	14.4 (1966)
Max	61.5 (1988)	45.9 (1980)	24.9 (1961)

Period 1
Renovation Phase (1959-1963)
Break from capitalism, planned economy, and diversification of land ownership
Average FAI of 84.6 percent

	Percent RDDNs (year)		
	Non-CAFs	Imported Foods	CAFs
Mean (1961-1963)	32.3	28.0	24.3
Min	31.3 (1961)	24.5 (1961)	24.0 (1962)
Max	34.2 (1963)	32.2 (1963)	24.9 (1961)

Description	**Event (mm/yyyy)[2]**
State-Directed Policy Network. Organisation of state power is high. Resources, and technical and policy expertise is developed and concentrated in the state sector. Hierarchical model of policy-making and implementation. Main actors include: • Revolutionary Government • Min. of National Defense • INRA • ANAP • CCSs • Foreign trade partners Program of economic diversification and industrialisation causes domestic economy to falter.	Revolutionaries oust the United States backed dictator. The Revolution begins (01/1959).
	Law 100 (02/1959) Issues of agriculture assigned to the Ministry of Defense.
	Law of Agrarian Reform (05/1959) Law grants land to peasants that had previously rented. Also reduces private landholdings to a maximum of 400 ha[3]
	National Institute of Agrarian Reform (INRA) is established and put in control of large land holdings (05/1959) Dissolved the Ministry of Agriculture and transferred its functions to the INRA.
	Resolution 1 of INRA; Law 599 (05/1959) Created the functional structure of

[2] Source, Valdés Paz, unless otherwise stated.

[3] Palma, et. al. (2015), 79.

Although new trade agreements for sugar are established, and ones to replace lost trade with the United States, sugar production falters. Although initial efforts were intended to return land to small farmers for growing food and to end the country's reliance on a sugar trade, and although "INRA members had the revolutionary spirit and desire to implement reform, [they] lacked the technical expertise necessary to achieve its objectives" (O'Connor, 1968). In addition, "the peasants lost the will to plant crops and till lands, causing a food shortage in 1962 and a rationing system that still exists" (Pérez, 2006). Food imports from the USSR increase.	INRA; assigned issues of agriculture created in the Ministry of Defense. Beginning of trade relations with the Soviets (02/1960).[4] United States ceases to accept Cuban sugar (07/1960).[5] Cuba enters multilateral sugar trade agreement with socialist states.[6] China extends $60M credit to Cuba, with very favourable terms.[7] Res. 247 of INRA (01/1961) Created the National Association of Small Farmers (ANAP) to control small land holdings, and assigned local sugar producers as delegates. Gov. extends 58 million pesos of credit to ANAP (01/1962).

Period 2
Growth Phase (1964-1976)
Nationalisation and Reindustrialisation
Average FAI of 101.2 percent

	Percent RDDNs (year)		
	Non-CAFs	Imported Foods	CAFs
Mean (1964-1976)	44.4	37.1	19.6
Min	33.0 (1964)	31.3 (1966)	14.4 (1966)
Max	50.4 (1976)	42.8 (1971)	24.7 (1974)

Description	**Event (mm/yyyy)**
Organisation of state power remains high in a state-directed policy network. Political-economic institutional reforms parallel to the Soviet model. The model is	Castro postpones the program of economic diversification and industrialisation. Focus again put on increasing production of sugar (08/1963).[9]

[4] Walters (1966).

[5] O'Connor (1968).

[6] Walters (1966), 74.

[7] Ibid, 75.

based on aid from one socialist country to another, and not on economic rationality. [8] The United States trade embargo was established. Significant assistance from the Soviets continues.	*Second Law of Agrarian Reform* (10/1963) Nationalised agricultural estates with area greater than 67 hectares.[10] Creation of private producers in cooperativas de créditos y servicios (ccs).
	New USSR/Cuba trade agreement replaces the 1960 agreement. Covers 1965 to 1970.[11]

Period 3
Maturation Phase (1977-1989)
Maturity of industrial agriculture and strengthening of the socialist model
Average FAI of 119.4 percent

	Percent RDDNs (year)		
	Non-CAFs	Imported Foods	CAFs
Mean (1977-1989)	57.8	41.8	19.8
Min	49.8 (1977)	37.9 (1979)	15.0 (1980)
Max	61.5 (1988)	45.9 (1980)	24.1 (1985)

Description	**Event (mm/yyyy)**
From 1976, some of the CCSs decided to voluntarily join, compacting their land to become collective properties in new Cooperatives of Agricultural Production (CPA), considered at the time to be closer to a socialist model of socioeconomic development and more favourable for the 'application of science and technology', fundamentally understood as the use of machinery. Both types of cooperatives have received generous state support in loans, technical assistance, and other benefits" (Díaz, 2014, 128). Reconversion of the INRA into the Ministry of	Constitution of 1976 (02/1976)

[9] Ibid, 78.

[8] Ibid, 82.

[10] Palma, et. al. (2015), 79.

[11] Walters, R. (1966), 78.

Agriculture. Shortages of food in the USSR and elsewhere in the world.	

Era 2: 1990-2003
Post Food Regime
Average FAI of 96.5 percent

	Percent RDDNs (year)		
	Non-CAFs	Imported Foods	CAFs
Mean (1990-2003)	30.7	26.1	39.7
Min	23.7 (2002)	20.3 (2003)	19.2 (1990)
Max	58.2 (1990)	43.5 (1990)	61.1 (2003)

Period 4
Collapse Phase (1990-1997)
Input Substitution
Average FAI of 92.8 percent

	Percent RDDNs (year)		
	Non-CAFs	Imported Foods	CAFs
Mean (1990-1997)	34.1	28.7	30.0
Min	25.3 (1994)	22.1 (1996)	19.2 (1990)
Max	58.2 (1990)	43.5 (1990)	33.8 (1996)

Description	**Event (mm/yyyy)**
Pressure Pluralist Policy Network Organisation of state power is low; organisation of non-state actors is low. Low cooperation between state and non-state actors.	
	Torricelli Act (10/1992)
	Resolution No.142, creates UBPCs (11/1993)
Input substitution.	*Helms-Burton Act* (03/1996)
In 1993, the government passed resolutions to begin the process of opening state-owned land to the Basic Units of Cooperative Production (UBPC), loosening restrictions on cooperatives made up of private producers in the National Association of Small Farmers (ANAP), and in 1994 formalised agriculture in urban with the creation of the Comisión Nacional de Organopónicos. Launch of MACAC in 1997. National Group for Urban Agriculture/ Grupo Nacional de la Agricultura Urbana (GNAU)	Resolution 208 by the Ministry of Agriculture: GNAU (1997).

Period 5
Renovation Phase (1998-2003)
Agroecological Extension
Average FAI of 101.4 percent

	Percent RDDNs (year)		
	Non-CAFs	Imported Foods	CAFs
Mean (1998-2003)	26.2	22.6	52.6
Min	23.7 (2002)	20.3 (2003)	39.5 (1998)
Max	29.4 (2000)	24.8 (1998)	61.1 (2003)

Description	**Event (mm/yyyy)**
Clientele Pluralist Policy Network Organisation of state power remains low. Non-state actors have organised and cooperate. This puts pressure on the state to respond. (See Machin, *et al*., 2013, 65).	

Era 3: 2004 to 2013 (last year of complete data)
Economic diversification

Period 6
Growth Phase (2004-2013)
Redirecting state resources into the growth of non-state enterprise and trade
Average FAI of 118.4 percent

	Percent RDDNs (year)		
	Non-CAFs	Imported Foods	CAFs
Mean (2004-2013)	29.5	32.3	56.6
Min	23.4 (2007)	22.2 (2004)	50.2 (2010)
Max	33.0 (2009)	35.7 (2008)	62.2 (204)

Description	**Event (mm/yyyy)**
Bolivarian Alliance for the Peoples of Our America (ALBA) formalises trade between Cuba and Venezuela.	Cuba and Venezuela form ALBA (12/2004)
	Economic and Social Policy Guidelines of the Party and the Revolution (04/2011)