



# Institutional analysis of food and agriculture policy in the Caribbean: The case of Saint Lucia



Arlette S. Saint Ville <sup>a,\*</sup>, Gordon M. Hickey <sup>a</sup>, Leroy E. Phillip <sup>b</sup>

<sup>a</sup> Department of Natural Resource Sciences, McGill University, Montreal, Canada

<sup>b</sup> Department of Animal Science, McGill University, Montreal, Canada

## ARTICLE INFO

### Article history:

Received 23 September 2016  
Received in revised form  
26 January 2017  
Accepted 1 March 2017

### Keywords:

Export intensification  
Social networks  
Rent seeking  
Smallholder farming systems  
Collective action

## ABSTRACT

The role played by various institutions in the domestic agri-food systems of Caribbean nations has become an increasingly important area of research and policy attention. This paper assesses the main policies that have been implemented in Saint Lucia's agri-food system over two time periods (pre-1950 and 1950 to 2010), and analyzes their influence on formal and informal institutions. Results suggest that rule convergence in export (formal) and domestic (informal) agricultural production systems displaced informal institutions to a lower position in the institutional hierarchy. This institutional change has reduced interactions between farming community members, with negative implications for bonding and bridging social capital in the domestic food production system. Collectively, these changes have resulted in unintended outcomes associated with the decline of many rural communities. Our findings highlight the need to better identify bridging institutions in Saint Lucia's domestic agri-food sector that could help support shared rule-making, the decentralization of power and reciprocal knowledge flows amongst policy actors.

© 2017 Elsevier Ltd. All rights reserved.

## 1. Introduction

Historically, the plantation institution, as the basic unit of colonial agricultural production in the Caribbean, heavily influenced social norms, interactions and relations in the regional agri-food system (Saint Ville et al., 2015). As a fully integrated institution that ruled over every facet of life in the region, the plantation was more than an economic phenomenon. Levitt and Best (1975) described it as a powerful political, economic and social unit (see also Beckles and Shepherd, 1996; Richardson, 1992). Despite sweeping social transformations across the Caribbean, ranging from emancipation of slavery, universal adult suffrage and political independence (Beckles and Shepherd, 1996), plantations heavily influenced the 'rules of the game' (North, 1991; Saint Ville et al., 2015) by defining formal rules, informal norms and their enforcement (see Guha-Khasnabis et al., 2007 on linkages between formal and informal institutions). In recognition of this historical legacy, noted Caribbean 'Plantation School' economists such as Lloyd Best,

Norman Girvan, George Beckford, and Clive Y. Thomas have called for a re-examination of the agri-food institutions operating in the region (Elliott and Palmer, 2008; Timms, 2008).

Formal institutions can be defined as the codified laws that govern governments, cooperatives, firms and communities, and which are followed by members (Hodgson, 2006), while informal institutions are understood as socially-defined codes of conduct that are transmitted through and by the community (Rahman et al., 2012). Increasing research and policy attention has been placed on how informal institutions facilitate social processes that can enable actors to manage and adapt to change, (Folke, 2006; Ostrom, 2009) interact, communicate, and innovate (Leeuwis and Aarts, 2011). Here, the concept of social capital, defined as the enduring connections of networks, reciprocity and social norms that exist among social actors (Narayan, 2002), has increasingly been applied to help understand social processes that influence information flows, power relationships and collective action (Adler and Kwon, 2002). Social capital comprises three dimensions: bonding (horizontal ties within a subgroup), bridging (horizontal ties bridging distinct subgroups) and linking social capital (vertical ties to power and finance developed through shared tasks directed towards the common good) (Grootaert et al., 2004; Sabatini, 2009). Not all social capital is considered equal, with these three dimensions playing

\* Corresponding author. Room MS3-039, Macdonald Stewart Building, 2111 Lakeshore Road, Ste. Anne de Bellevue, Quebec H9X 3V9, Canada.

E-mail addresses: [arlette.saintville@mail.mcgill.ca](mailto:arlette.saintville@mail.mcgill.ca) (A.S. Saint Ville), [gordon.hickey@mcgill.ca](mailto:gordon.hickey@mcgill.ca) (G.M. Hickey), [leroy.phillip@mcgill.ca](mailto:leroy.phillip@mcgill.ca) (L.E. Phillip).

different roles in social processes.

While previous research has identified strong relationships between social capital, information flow, and agricultural innovation in smallholder farming systems (see van Rijn et al., 2012; Dessie et al., 2013; Speranza, 2013; Wossen et al., 2013; Chen et al., 2014; Reed and Hickey, 2016), relatively little is known about how institutional dynamics affect interactions between different dimensions of social capital (Adger, 2003; Pelling and High, 2005; Kode, 2013). Importantly, while there has been some empirical work on the various roles that different institutions play in affecting smallholder agricultural innovation systems in the context of Sub-Saharan Africa (Darr and Pretzsch, 2008; Timu et al., 2012; Mashavave et al., 2013), there has been little-to-no empirical research in the Caribbean, particularly in the context of social capital and collective action (see, for example, Dessie et al. (2013) in the context of Ethiopia). Recognizing the need to better understand these complex relationships in Caribbean smallholder farming systems, this paper explores how various dimensions of social capital have evolved and both influenced, and been influenced by, institutional dynamics in Saint Lucia's domestic agri-food system.

**2. Methods**

*2.1. Data collection*

Following a case study research design (Yin, 1994), qualitative data were collected using archival, documentary, direct observation and key-informant interview methods. This strategy allowed us to describe complex social relationships and reveal the interconnections between actors (Glaser and Strauss, 1967; Becker, 1996; Yin, 2002). All field data collection activities were undertaken between July and October 2013. Key informant interviews (Becker, 1996) were conducted with 57 respondents (Table 1) across Saint Lucia, including all major farming communities (Castries-Roseau/Millet, Babonneau, Dennery, Micoud, Choiseul, Vieux Fort) on the island (see Fig. 1). Interview respondents were purposively sampled following a snowball strategy using two selection criteria: 1) they held a position or role in farmer/community mobilization at the national level (political activists, sociologists, journalists, environmentalists, anthropologists, trade unionists, historians, folk researchers, linguists); or 2) they were senior smallholder farmers who had been producing in the food system for over 50 years. To ensure that we were able to access a wide a group of these (often retired) farmers, we sought assistance from the Ministry of Agriculture, Food Production, Fisheries, Cooperatives and Rural Development, private sector, NGOs, farmer

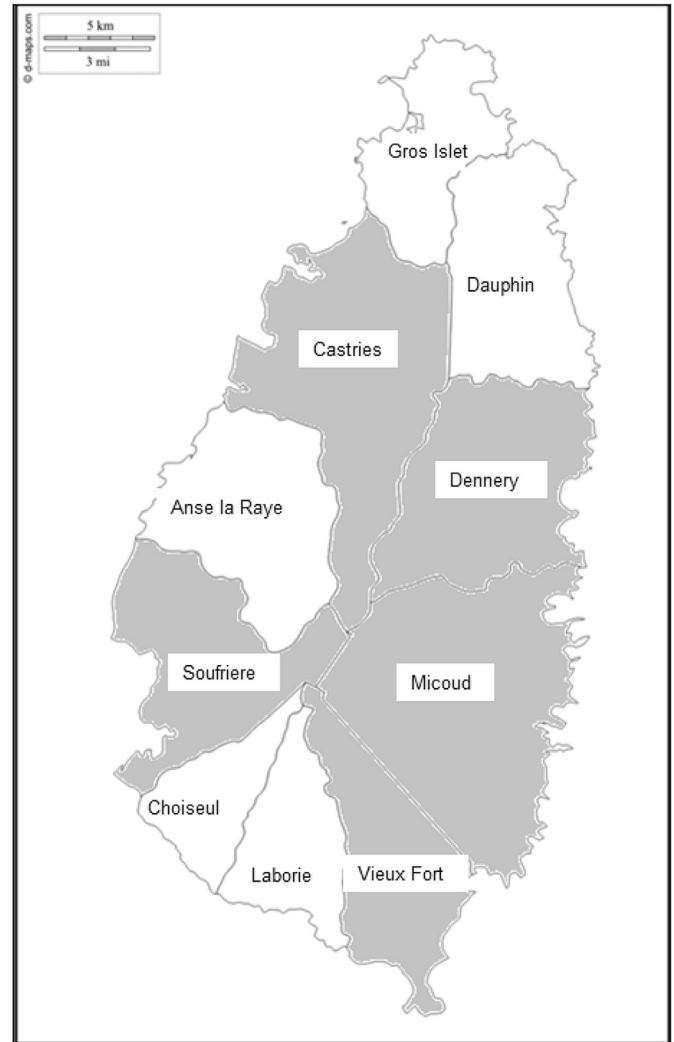


Fig. 1. Map of Saint Lucia showing major agricultural areas.

groups, faith-based organizations and community leaders in the major rural communities to identify and locate prospective farmers across the island.

Interviews followed a semi-structured format and covered four major areas: 1) the 'rules-in-use' that direct actors, and help guide

**Table 1**  
Respondent profile.

Key Informants	Total	Male	Female
Group 1: Smallholder Farmer (65–80 years old)			
<i>Location of Farming community</i>			
Northern Communities (Babonneau, Bexon)	4	4	0
Southern Communities (Vieux Fort, Micoud)	12	12	0
Western Communities (Choiseul, Millet, Anse la Raye)	7	5	2
Eastern Communities (Dennery)	7	3	4
<i>Sub-total</i>	30	24	6
Group 2: National Specialists			
Agriculture (finance, engineering, policy, economics) and Natural resource management	7	6	1
Historian/Sociologist/Linguist/Anthropologist	8	6	2
Trade union activism/Civil society activism	2	2	0
Journalists/Counselor	4	3	1
Community development/Mobilization/Disaster management	3	1	2
Farmer organizations/Capacity building	3	2	1
<i>Sub-total</i>	27	20	7
<b>Total</b>	<b>57</b>	<b>44</b>	<b>13</b>

their interactions; 2) the nature of interaction between social actors and the collective-action problems related to getting farmers working together to solve their shared problems; 3) power or information asymmetries in their interaction that serve to limit farmers' willingness to work together; and 4) incentives that are associated with conforming to the different institutions operating in Saint Lucia's agri-food system. Interviews and follow-up discussions were conducted in English or the local dialect of *Kweyol* with the help of a translator/field assistant as required.

## 2.2. Data analysis

Interviews were recorded, translated, and transcribed in full for content analysis (Altheide, 1987; Morgan, 1993). The constant comparison method (Glaser and Strauss, 1967) was used to manually code the data using MaxQDA, with themes and categories emerging through an iterative and recursive process leading to patterns being identified. The Institutional Analysis and Development (IAD) framework (Ostrom et al., 1994) was then used to structure our analysis of institutional change in Saint Lucia's agri-food governance systems. More specifically, we were guided by the adapted IAD frameworks of Fischer et al. (2007) and Rahman et al. (2014) when conducting our analysis of institutional change, focusing on two time periods: pre-1950 (the period preceding the export banana intensification policy) and 1950 to 2010 (the period following the export banana intensification policy). These two time periods were selected to capture the change from sugar production to contract banana production beginning in 1953 (Grossman, 1998), and cover the decline of banana export markets following trade liberalization in the late 1990s. In an effort to limit the scope of this paper, food imports were not addressed in the analysis of focal action situations for the domestic market. This allowed our analysis of change to differentiate between informal institutions involved in the production and marketing of fresh foods for domestic markets, from the formal institutions involved in production and marketing of fresh foods for export markets.

We also applied the Program in Institutional Analysis of Social-Ecological Systems (PIASES) framework (McGinnis and Ostrom, 2010; McGinnis, 2011) to guide our temporal analyses into the rules operating in export (formal) and domestic (informal) markets (McGinnis, 2013). PIASES is a dynamic framework that uses the IAD framework and facilitates an improved understanding of how interactions, flows of information and resources shape decision-making in a SES. Additionally, our use of PIASES has implications for future research through the use of common conceptual language that intersects with Ostrom et al. (1994) principles of design.

It is important to note that this research was based on an assumption that the effects of public policies on agrarian change can be better understood through analyzing institutional development, operation and change processes over time. It therefore adopts a neo-institutionalist perspective, where individuals are seen as having relatively little impact on public policy, with structure and design instead affecting policy outcomes (March and Olsen, 1983; Greenwood and Hinings, 1996).

## 3. Results

In this section we use the first tier variables of the PIASES (Governance System; Actors; Resource System and Resource Units; and Interactions/Outcomes) to structure our findings from archival, documentary and key informant interviews. Using these headings, we then describe the second tier variables operating, first in the export (formal), and then domestic (informal) markets. In presenting our findings, we describe variables beginning with the pre-1950 period (preceding export crop intensification) and then the

1950–2010 period (following export crop intensification).

### 3.1. Description of the focal action situation pre-1950: formal and informal institutions

#### 3.1.1. Governance system

3.1.1.1. *Formal governance system (pre-1950)*. Findings revealed social, political and racial divisions permeated formal governance systems of Saint Lucia in the pre-1950 period. Key informants described highly authoritative and centralized public policy processes, with minimal interaction from the Black citizenry. Caribbean writers have described this period as a relic of slavery, with a plantation agriculture culture in effect that was informed by an exploitative ethic (see also Richardson, 1992). Previously, as a Crown Colony, the Colonial Administration vested political power in the Governor who was supported by two councils: a six-member Executive Council (comprising the Governor, Treasurer, Attorney General, and three other unofficial members selected by the Governor from the planter class); and a twelve-member Legislative Council, (comprising the Executive Council and five unofficial members of the planter class and merchant class). With economic and political power concentrated in the hands of the minority 'White planter class', the formal governance systems in this period can be characterized as monocentric (Wenger, 2010). Termeer et al. (2010) defined such a system as one where the state, as the national authority, controls the national agenda and problem-solving takes place through 'top-down' policy definition and implementation. As the centre of political power in such a governance system, White formal actors used their state-appointed political power to control society, resources and the economy. To illustrate, Corthésy and Harris-Roper (2014) have identified that employment law during this period was designed to "subjugate and control" (p.20) the Black working class. In the case of Saint Lucia, planters maintained social and economic divides by instituting vagrancy laws, high land sales taxes, and licensing fees on transportation to pressure labourers into continued employment on their estates (Harmsen et al., 2012).

Political power remained in the hands of the White minority until adult suffrage gave political power over to the citizenry. Political change began for the Black majority in 1921. At that time, limited franchise allowed only 1509 people to vote (2.3% of the population) which maintained the top-down approach with a minority of social actors shaping public policy. Without democratic avenues to get their issues heard, exposed to deplorable working conditions on estates and repressive laws, the Black population resorted to civil disobedience, including strikes and riots (Harmsen et al., 2012). As described by George Charles (1994):

As a period (1930s-1940s) of low wages, long hours of work, no rest on Sundays and public holidays, employment of child labour, little or no health facilities, no vacation leave, no compensation for industrial injuries and limited educational facilities and 90% of the people were illiterate and disenfranchised ... these conditions meshed into a powder keg which exploded in 1937 ... with strikes, riots and violence (pp. 12–13).

The British Government responded to this social unrest across the British Caribbean by instituting the *Royal West India Commission (1945)* (more popularly known as the Moyne Commission). Their report, released in 1945, made varied recommendations, but it was the legalization of trade unions that initiated the preliminary transformation of the political system by stimulating the trade union movement in Saint Lucia, supported by universal adult suffrage in 1950.

3.1.1.2. *Informal governance system (pre-1950)*. While a small

White minority dominated the formal governance system, the reverse situation existed in the informal governance system. Although there is a dearth of archival records on this governance system, oral histories shared by key informants described a plethora of informal institutions that governed rural communities. These developments followed the departure of ex-slaves from sugar estates, after the Emancipation of Slavery Act of 1833. Economically marginalized and politically disenfranchised, our findings suggest that these rural communities developed in proximity to plantations, but were governed autonomously through social capital embedded in intra-community networks. These findings are supported by [Louis \(1981\)](#), in his doctoral thesis on the development of the Saint Lucian peasantry. He described how through well-organized community-based interactions (such as annual cultural Flower Festivals), different communities came together, competed and developed what he termed “a collective identity” (p. 110). These community-based groups were not limited to cultural development, but also undertook infrastructural development (such as church building).

In the absence of support from the formal governance system, [Harmsen et al. \(2012\)](#) noted how these community-based groups allowed the development of “self-expression, identity-formation and social-diversification” (p. 187) that supported the development of informal institutions. The role of these groups in rule-making may be explained by the work of [Bourdieu \(1989\)](#), who highlighted the importance of symbolic capital, used to legitimize the social world by actors and likely served to validate these newly developing rules and interactions. Through such social legitimizing processes, communities self-organized using social capital, particularly trust and reciprocity. Examples of informal institutions identified by our key informants included: land sharing, labour sharing (Helping Hands, Cou-de-main), product sharing, Burial Aid, and rotating savings groups (Sous-Sous). These institutions were fostered by horizontal accountability and collaboration and appeared to integrate community members, through their negotiated involvement in mutually relevant activities. As described by a retired farmer of Labayee community:

[E]verybody would drop their children at a particular person's home and they would together weed each other's gardens, by turns ... it was a kind of a spontaneous arrangement where they created their own support.

Although a potential drawback of this informal governance system was that it promoted and required collaboration based on a common identity, [Wenger \(2010\)](#) suggests it is generally more supportive than the monocentric model to collective learning and adaptation.

### 3.1.2. Actors

This section presents our findings on the actors that comprised the focal action situation in the formal (export market), and then informal (domestic market). This is seen as an important facet of institutional analysis in order to better assess how various actors use resources and the nature of their interactions ([Fischer et al., 2007](#); [Rahman et al., 2014](#); [McGinnis and Ostrom, 2012](#)). Our findings reveal four main actors operating in the pre-1950 agri-food system: planters, agricultural workers/labourers, sharecroppers/metayers (boundary actors), and subsistence farmers.

#### 3.1.2.1. Formal institutional actors (pre-1950)

**3.1.2.1.1. Planters.** The White planter class owned large sugar estates (~100), with each covering hundreds of hectares of fertile alluvial plain distributed across rural Saint Lucia ([Lewis, 1968](#)). For example, Marquis Estate, located on the northeast coast, covered

over 1032 ha. Planters in Saint Lucia struggled through varied crises (from natural disasters, slave revolts/labour riots, sugar market declines and military instability) that resulted in their dwindling numbers ([Harmsen et al., 2012](#)). In addition to owning prime land resources dedicated to sugarcane production, each planter held significant financial investments in sugarcane, from production equipment, processing facilities to shipping arrangements ([Richardson, 1992](#)).

**3.1.2.1.2. Agricultural workers/labourers.** Our findings indicate that in the pre-1950 period, these agricultural workers of African origin continued to play the dominant role as labourers on plantations. The 1946 Census showed that 25% of the population (17,528 persons) were involved in wage labour. An estimated 50% of these were employed as agricultural workers (25% in the sugar industry, and 25% in other export crops) and the remaining 50% were employed in non-agricultural pursuits ([GOSL, 1989](#); [Harmsen et al., 2012](#)). Agricultural workers held no legal contracts but many were employed and housed over long periods of time (covering generations) on estates.

**3.1.2.1.3. Share-croppers (metayers).** Metayers were agricultural workers who entered into share cropping arrangements (called *metayage* in French) with planters. Typically from these contracts, share-croppers received three acres of estate lands for an agreed time (usually six years) and shared half of the returns from sugar sales with planters. In exchange, planters provided them with additional lands to build a residence, produce food (subsistence), and raise animals. Through these agreements, planters consolidated their land capital while simultaneously accessing cheap labour from these semi-independent producers, who accessed virtually free labour from their fellow community members through their social networks ([Adrien, 1996](#)). As a result of their risk taking activities, metayers advanced as entrepreneurs. Ironically, their economic success was predicated on access to labour (based on their social capital) from community members, at costs and productivity levels unavailable to the planter class. As boundary actors, metayers also operated as informal institutional actors who served to bridge the informal and formal domains of agri-food system governance in Saint Lucia. Such bridging interactions were risky, with metayers often accusing planters of overcharging (for cutting, hauling and processing of cane) and cheating on marketing accounts ([Adrien, 1996](#); [Harmsen et al., 2012](#)).

#### 3.1.2.2. Informal institutional actors (domestic markets) (pre-1950)

**3.1.2.2.1. Subsistence farmers.** Key informants described this single group of actors in the informal system, as relatively homogeneous: rural-based, unemployed or under-employed, producing at subsistence levels for their households and the domestic market ([GOSL, 1989](#); [Harmsen et al., 2012](#)). Cash strapped with limited resources, cooperation among community members was a pre-requisite for their survival. Community members worked together, produced food and additional crops (shelter, medicine, rope, firewood) to support themselves and their households. Their low use of technology was compensated by high labour inputs ([Brierley, 1988](#)), and may help explain why social cooperation guided their interactions to manage and share needed labour inputs.

### 3.1.3. Resource systems and resource units

#### 3.1.3.1. Formal resource systems and resource units (pre-1950).

As an agrarian society, export production remained the primary economic activity in Saint Lucia. Detailed archival records of export production over this colonial period (such as annual agriculture reports) describe the export crop quantities produced, processed, exported and incomes generated. Apart from sugar, other export crops included: limes, cocoa, coconuts, and bananas. Despite these emerging export crops, sugarcane production dominated large



estates. These plantations required a long-term investment of time and resources, since the sugar crop took between 12 and 16 months from planting to harvest. Low fertility from longstanding monocrop production required fertilizer application of animal manure and imported nitrogen, typically applied before planting. Annual sugar production volumes were managed through a sugar export quota, with processing of cane occurring at four centrally located factories (Harmsen et al., 2012). Quotas declined over the period due to competition from cheaper producers. For example, in the period leading up to 1950, the annual quota was less than 10,000 metric tons, compared to half a million metric tons in the 1890s (Adrien, 1996).

Sugar market declines (reduced quotas, sugar prices and falling wages) created economic woes for formal actors with workers most disadvantaged. In response, colonial administrators sought substitute export crops, as recommended by the Royal West India Commission Report (1945). Earlier efforts (in 1924) to introduce export bananas proved unsuccessful due to pest infestation from Whither tip disease (*Colletotrichum gloeosporioides*) (Harmsen et al., 2012). With fertile lowlands covered with sugarcane, available flat lands were scarce. The search for new lands to grow bananas encouraged the widespread clearing of forested hillslopes. To illustrate, in one year, 300 ha of forested slopes were cleared (Harmsen et al., 2012). In the absence of conservation protocols, massive landslides resulted, most notably in 1938, when two major landslides killed 100 people, injured 23, and left 700 homeless (Reynolds, 2006).

*3.1.3.2. Informal resource systems and resource units (pre-1950).* Key informants described the pre-1950 time period as cash-strapped, with the majority of rural actors working collaboratively to produce crops at subsistence levels. Sale of excess production took place at weekly farmer markets that served to bolster household incomes. These farmers markets evolved from slavery, to facilitate exchanges of fresh foods produced on small plots (provision grounds) by slaves (Harmsen et al., 2012). Later, their production for the domestic market took place on small farms in the forested hillslopes surrounding rural communities. Volumes were typically small with diverse crops grown (e.g., food crops, wood for shelter and firewood, medicinal plants). Actors sold fresh foods of relatively low economic value, at these weekly markets.

#### *3.1.4. Interactions and outcomes*

Our findings support the view that the plantation institution had a strong influence on the export (formal) and domestic (informal) agri-food systems in Saint Lucia. In particular, the institutions governing land rights evolved from two distinct paths influenced by both the British and French. While British law came into force when England gained control of Saint Lucia in 1840, the Napoleonic civil code and French communal land inheritance laws continued due to the longevity of French<sup>2</sup> colonial rule (see Crichlow, 1994). French communal land inheritance laws gave rise to communal lands that represented an estimated 45% of all lands. Informal institutions guided the access and control of these lands. Known colloquially as ‘family land’ they were managed through shared working rules: 1) co-owners hold blood-rights but often lack a deed or other legal evidence of their land rights, 2) bloodline allows right of access and use of lands, and 3) all co-owners are permitted to harvest permanent crops planted on the lands. In contrast, planters held British-influenced private property rights over large land estates. Table 2 presents these parallel land tenure systems using Ostrom et al.’s (1994) seven categories of working rules guiding natural resource management. In the domestic market (pre-1950), boundary/entry rules required community residence/family land access while export markets were guided by production quotas and plantation ownership. Scope rules directed

who was authorized to manage the resource, which was the basis of legal and economic rights. In the sugar export market, these rules directed private property rights that covered the most fertile lands, while shared rules oversaw domestic production on communal lands typically located on marginal hillsides. Information rules guiding these markets and cropping systems were markedly different. In the export market, these rules were restricted. They involved protectionist policies and quotas and depended heavily on access to external supports (e.g., imported fertilizers, and market connections).

In contrast, these rules in the domestic market served to coordinate production volumes and the large numbers of people involved in production. As such, information was guided through open rules and community social networks. Choice rules in the domestic market directed actions that community members could take that supported collaboration and open knowledge exchange. Payoff-rules, by assigning benefits and incentives, and aggregation rules that oversaw control, served to regulate behaviours and limit excess production. For example, labour and land sharing strategies helped ensure that at the community level everyone received assistance, based on their participation guided by the neighbour-reciprocity principle (Ostrom, 2000). These rules ensured that collaboration served to obtain and encourage greater equity and accountability.

Operating between these two production systems, metayers appear to have served as ‘boundary spanners’ between the formal and informal institutions. In their model of policy responsiveness, Gauri and Lieberman (2006) defined such a phenomenon as boundary actors who, through their interaction, play a critical role on the periphery of formal and informal institutions. These boundary actors also provide opportunities to shape the setting of rules that help regulate racial group interaction and manage inter-group behaviour.

### *3.2. Description of focal action situations 1950–2010: formal and informal institutions*

Following Rahman et al. (2014), in this section, we present the second segment of our analysis looking first at the export (formal) and then domestic (informal) institutions operating in Saint Lucia’s agri-food system from 1950 to 2010.

#### *3.2.1. Governance system*

*3.2.1.1. Formal governance system (1950–2010).* Key informant interviews described how adult suffrage in 1950 initiated the structural transformation of Saint Lucia’s political system. The right to vote placed political power in the hands of the majority Black populace and energized union-influenced political parties. In 1951, Britain approved a new constitution that left the social-political system unchallenged, increased representation by elected members on the two governing councils and reduced the number of nominated members. With these developments, the British colonial administration sped-up the process of statehood in the region and the transfer of political power toward self-government (Harmsen et al., 2012). While these rights and nation-building activities (culminating with independence in 1979) held great symbolic meaning for the citizenry, it did not challenge the underlying monocentric (state-led and directed) governance system. Rather, the election process became the singular means to engage the masses into policy processes (through manifestos every five years), and did not reconcile the low level of citizen engagement in policy processes.

*3.2.1.2. Informal governance system (1950–2010).* Key informants described how self-governing institutions in rural communities

**Table 2**

Rule inventory showing changes in rules guiding production in the agri-food system revealing rule convergence in the formal (export) and informal (domestic) markets from pre-1950 to the 1950–2010 period.

<i>Rules under examination</i>	<b>Pre 1950</b>		<b>post 1950-2010</b>	
	<i>Informal</i>	<i>Formal</i>	<i>Informal</i>	<i>Formal</i>
Boundary - number of participants, and conditions for entry and exit	Subsistence, community residence/ for entry/land blood right	Export quotas Legal/market relations (e.g. worker, planter, metayage)	Minimum requirements/ anyone can enter/land blood right	Minimum requirements/ anyone can enter/land blood right
Position - who holds what position, become leaders and get responsibility	Structural social capital based (social networks), kinship	Property ownership, external monitor/	No formal positions exist /Extension Officer	Extension Officer, Specialists
Scope rules - who is authorized or forbidden or outside of the functional domain	Community-based, joint monitoring	Economic or legal authority	Each individual can take any action in their economic interest	Each individual can take any action their economic interest
Choice rules- assigns actions that actors may, must or must not take	Collaboration/ fixed order (labour, product sharing)	Exploitation	Exploitation, each individual can take any action	Exploitation, each individual can take any action
Aggregation rules- level of control exercised by positions	Neighbor agreement	Independent, contract	Conditional cooperation/ independence	Monitor decision, act independently
Information rules- knowledge sharing, information to be held secret	Open, rule infraction publicity through social networks	Top-down, restricted access	Restricted social networks ("who you know")	Top-down, restricted access
Payoff rules- costs and benefits assigned to actions and outcomes (incentives and deterrents)	Reciprocity, labour obligation	Economic benefit	Limited social cohesion, trust, reciprocity/ economic benefit	Economic benefit, penalty

waned with implementation of the export banana intensification policy. Over a short period of time, large numbers of subsistence farmers exited domestic markets to pursue more lucrative export markets, leaving behind a small group producing in the domestic market. While some informal institutions remained associated with domestic markets, existing social networks became fragmented. New social interactions subsequently emerged. For example, subsistence farmers who were unable to access lands to become export banana farmers migrated into banana-producing areas as agricultural workers. As a result, informal governance systems diminished in influence and coverage. Additionally, as part of nation-building developments, a local Ministry of Agriculture was staffed and mandated to manage domestic markets. Vertical lines of command guided top-down, command and control governance approaches used by the ministry and statutory agencies (such as state appointed representatives to direct the Marketing Board and Development Bank) working through specialist employees (such as agricultural officers, agronomists, agricultural economists). With the state now setting the agenda in the domestic market, these newly created national ministries and agencies set policy goals, yet operated independently of informal institutions in

domestic markets, resulting in a generally poorly-coordinated policy environment.

### 3.2.2. Actors

3.2.2.1. *Formal institutional actors (1950–2010)*. We identified varied actors involved in the implementation of export banana intensification policy. These actors displayed considerable heterogeneity (scale of operation, cultural and economic interests) as they facilitated the transition from sugar to intensive banana exports. Each performed specialized roles needed to integrate farmers into global banana export markets based on newly imposed rules. In the section below, these actors will be discussed in order of decreasing scale (international, sub-regional, national and household/farm household level): Geest Industries, Windward Islands Banana Growers' Association (WINBAN/WIBDECO), Saint Lucia Banana Growers Association (SLBGA), and independent banana farmers.

3.2.2.1.1. *Geest industries*. By creating the guaranteed protected market for bananas, the British Government initiated the formal policy of export agriculture intensification. This formalized arrangement began in 1953 with the contract awarded to the small British family-firm Geest Industries to buy all Windward Island<sup>3</sup>

bananas (Grossman, 1992). The company flourished as the export market developed over time. By 1971, Geest had expanded into a banana production, shipping and marketing 'giant' and owned 4000 ha of sugar estates converted into Windward Island banana farmland. In 1983, confronted by labor shortages and political unrest, the company divested their banana holdings of over 16,000 ha through sale to ex-laborers (Monrose, 2004). By the late 1990s, the company completely sold off its interests in the banana industry, and changed its strategic interest to convenience foods. British media noted that the sale price for the company was higher than expected, with Geest registering a profit of £21.5 UK million from the sale (Stevenson, 1995).

3.2.2.1.2. *Windward Islands Banana Growers' Association (WINBAN)/Windward Islands Banana Development and Exporting Company (WIBDECO)*. Initially established to administer crop insurance to protect the fledgling banana industry from hurricane damage, Windward Islands Banana Growers' Association (WINBAN) held a minor role in the supply chain. It was owned by the National Banana Growers' Associations of Dominica, St Lucia and St Vincent and the Grenada Banana Cooperative Society. As Geest Industries banana interests waned, the Windward Island Governments became the major shareholder of WINBAN. Initially WINBAN's role expanded to provide administrative, as well as research and development services. Later with incorporation in 1961, and commercialization in 1994, it was transformed into the business entity Windward Islands Banana Development and Exporting Company Limited (WIBDECO), with a UK Subsidiary, WIBDECO UK. At this point, WIBDECO became the key intermediary organization in the supply chain, contracted by Geest Industries to supply bananas from all national Banana Growers Associations. Two years later, WIBDECO, in a joint-venture with Fyffes, purchased interests in the regional banana shipping line of Geest Industries, and five years later, the marketing arm of Geest Industries. In 2003, WIBDECO bought out the Fyffes partnership and assumed full control (once held by Geest Industries) of supplying, shipping, marketing and distribution of all Windward Island bananas in Europe. Ironically, this expansion coincided with growing market uncertainty, low banana production (34,000 tons, valued at \$16 US million) and declining producer participation (1600 registered farmers in Saint Lucia) (Reynolds, 2006).

3.2.2.1.3. *St Lucia Banana Growers' Association (SLBGA)/Saint Lucia Banana Corporation (SLBC)*. SLBGA linked first Geest, then later WIBDECO with Saint Lucian banana farmers. Formed by the St Lucia Banana Growers' Association Act No. 6 of 1967, the association was managed through a government appointed board. Informants shared how concerns mounted, as the associations' activities became more complex, and less transparent. As SLBGA operations ballooned over time, deductions in farmer payments increased. For example, initially farmers delivered bananas in bunches to the ports. In 1970, the delivery system changed to shipping in boxes. These changes required investments in SLBGA facilities and processes, with bananas washed, chemically treated, crated, stored and transported weekly to ports. Later these 'boxing' responsibilities were transferred to farmers (Reynolds, 2006). By the 1990s, growing costs of production, market uncertainty from changing trade regimes, and falling crop prices had stoked farmer dissatisfaction. Compounding matters was the flood of cheaper Central American bananas into European markets, as a market penetration strategy (Reynolds, 2006). These market uncertainties, and growing charges of corruption by the SLBGA, galvanized farmers into collective action. In 1996, farmers rioted and refused to harvest banana crops. Many stopped harvesting bananas voluntarily, but others were forced to participate by the burning down of their crops (Reynolds, 2006). The government response to this national crisis culminated with two farmers being killed as police attempted to

disperse demonstrators (Reynolds, 2006). Farmers had the last say in the general elections of 1997 when the incumbent government was toppled by 16 seats to 1. As promised in their election manifesto, the new government dissolved the embattled SLBGA (September 1998) as part of efforts to return the association to the control of farmers (Joseph, 2011). After paying off its \$16 US million debt (Reynolds, 2006), they created a privately-owned company, the Saint Lucia Banana Corporation (SLBC). This company was owned by 3000 newly certified farmers who each received one share (Reynolds, 2006). Other market-based reforms took place, that segregated banana farmers by size and experience, as additional companies entered the liberalized market. By 2000, there were four local privately-owned companies selling fruit to WIBDECO from less than 2000 banana farmers (Reynolds, 2006).

3.2.2.1.4. *Independent banana farmers*. Our key informants described banana farmers as a mixed group comprising ex-sugar planters, ex-metayers, ex-workers and ex-subsistence farmers. An open entry policy allowed almost anyone to become a registered banana farmer, as long as they had access to lands (that could hold one hundred banana mats - less than 0.5 ha). Once registered, they became a member of the St Lucia Banana Growers' Association (SLBGA). As the national purchaser, the association was obligated to buy all their fruit of export quality. After some initial delays, large numbers entered banana production (Harmsen et al., 2012). By 1965, Saint Lucia boasted 12,479 registered banana growers (O'Loughlin, 1968; Welch, 1994). Clear differences (business skills, social capital use) between members of this group allowed the better-resourced planters and entrepreneurial metayers to make better use of membership opportunities (e.g., SLBGA Board representation, money and farm management).

3.2.2.2. *Formal institutional actors (domestic markets) (1950–2010)*. Unlike the highly coordinated and defined stakeholder roles in the banana export supply chain, one main formal actor guided policies in the domestic markets. Two other actors played supportive roles, as guided by the Ministry of Agriculture.

3.2.2.2.1. *Saint Lucia Ministry of Agriculture (the ministry)*. With statehood, Saint Lucia received increased local control over internal affairs like agriculture although exports remained of primary policy importance. Soon the Ministry of Agriculture developed as a fledgling public service department with local mandates. Since the institutional arrangement that integrated banana farmers in global food chains were already well developed, the ministry held responsibility primarily for domestic market operations. With the majority of local resources in the agricultural sector (land, infrastructure and labour) allocated towards export banana production, ministry activities played a secondary role in the agri-food system. In the late 1990s, with the collapse of the protected banana market through trade liberalization, the importance of the ministry and domestic food production increased rapidly.

3.2.2.2.2. *Saint Lucia Marketing Board (SLMB)*. In response to difficulties faced by smallholder farmers in the marketing of food crops for the domestic market, the Government established the St. Lucia Marketing Board (SLMB) in the 1960s as a statutory body, managed through a government-appointed Board. These board representatives, their policy goals, means and top-down implementation approaches varied widely, with changes in political power and authority. SLMB acts as a wholesaler, purchasing fresh foods from farmers to retail to supermarkets and hotels and to export. Although SLMB was expected to play a dominant role in marketing, it struggled to fulfil its mandate. After one decade of operation, a report by Marhatta et al. (1978), found that it handled only small volumes of local produce as part of its total production and sales. This was estimated at 2 percent annually. The report also described the challenges of marketing fresh food in Saint Lucia,

many of which remain highly relevant:

[V]ery disorganized ... small scale, without well-defined standards, marketing practices, or facilities ... the marketing system is primitive and inefficient in moving goods ... farmers and their wives still perform a significant portion of marketing functions themselves (p.21).

**3.2.2.2.3. Farmers' organizations.** As part of development activity in the agricultural sector, farmers' organizations were widely promoted. Seen as overtly positive, these organizations were expected to link farmers (input suppliers, exporters, processors and consumers) along the supply chain to achieve outcomes, but they have proven challenging to sustain. One such example is the Black Bay Farmer's Cooperative. Our key informants acknowledged this cooperative as one of the two most successful farmer groups producing fresh foods for the domestic market. The history of this group records the ongoing external (donor-led) supports required to sustain its survival. Launched in 1974, it comprised eleven family farms growing on 25 acres. It faced a myriad of challenges, and floundered until repeated injections of donor technical, financial and administrative capital re-catalyzed production. By 1988, it had mushroomed to the current size of 35 members producing on 51 acres (IICA, 1989). With assistance from OXFAM and other international donor agencies, the group was formally incorporated as an agricultural cooperative in 2008. Despite the expected benefits (economies of scale, reduced transaction costs, and increased power for collective bargaining), such farmer groups in Saint Lucia producing for the domestic market have not been able to coordinate their activities. Most of our key informants assessed these groups as struggling to operate, while providing minimal services to members.

### 3.2.2.3. Informal institutional actors (domestic markets) (1950–2010)

**3.2.2.3.1. Smallholder farmers producing for domestic markets.** As contract banana production became more profitable, farmers exited domestic production leaving a smaller, disaggregated group to sustain primarily ad hoc production of fresh foods. These included smallholder farmers (ex-subsistence farmers): whose lands were located in areas (the leeward side of the island) where microclimatic conditions were not conducive to banana production, whose lands were too small (less than 100 mats), or who were unwilling or unable to grow bananas. This phenomenon was noted across the region, as the growing export sector squeezed remaining smallholder producers into a smaller niche (Levitt and Best, 1975). Eventually, with the liberalization of banana markets in the late 1990s, large numbers of banana farmers re-entered domestic production (for more information see Saint Ville et al., 2015).

### 3.2.3. Resource systems and resource units

**3.2.3.1. Formal resource systems and resource units (1950–2010).** While a number of institutions worked in tandem, SLBGA facilitated all national coordinating activities required for banana production. They performed this role by providing the technical support needed for high-input monoculture production under the objective of maximizing yield. Initial reluctance to plant bananas following the decline of sugar, the associated high risks of monoculture production waned as incomes increased and banana crop insurance provided benefits following natural disasters (provided by WINBAN/WIBDECO). As the coordinating organization, SLBGA managed national activities such as disease control (aerial spraying), provision of technical services through extension officers, providing inputs (agrochemicals) on credit, purchasing, making sales to Geest and returning payments to farmers (less deductions) (Reynolds,

2006). Despite their role as an interface with farmers, our key informants described their interactions with the SLBGA as being fraught with frustration and distrust. A contentious issue was SLBGA deductions from farmer banana payments that increased over time. While it is likely that rising costs were due to increases in administrative and input costs needed to manage pests and coordinate production (Murray and Hoppin, 1992), our key informant farmers were more likely to suggest it was as a result of corruption. Large-scale investments by national governments in the industry did not address growing farmer concerns, and failed to recognize the importance of farmer trust in maintaining the banana export industry. In 1995, Geest sold its banana business to a joint venture of WIBDECO-Fyffes for £147.5 UK million (each party purchased a 50% share) (Reynolds, 2006). However, with the dismantling of preferential trading arrangements, despite the consolidation efforts by WIBDECO, our respondents described declining levels of trust in the industry that triggered declines in farmer participation in the export market.

**3.2.3.2. Informal resource systems and resource units (1950–2010).** Our findings suggest that the small group of homogenous smallholder farmers producing for the domestic markets operated at small scales and in an ad-hoc fashion, until trade liberalization in the late 1990s. In the post-trade liberalization period, smallholders producing food for the domestic market became increasingly heterogeneous as some ex-banana farmers entered domestic markets. Data from the Agricultural Census (2007) showed that land allocated for temporary crops<sup>4</sup> or short term crops (root crops and vegetables) doubled from 4570 acres in 1996 (8.9% of the total area) to 6017 acres in 2007 (accounting for 20% of the total area). These short-term crops were of relatively low economic value, but compared to bananas, informants reported better returns and lower production costs. With their entry, and in the absence of coordination, domestic producers limited their production volumes to reduce potential losses from gluts, short shelf-life of fresh produce, and limited availability of processing facilities.

Marketing of fresh foods crops continued at weekly (and bi-weekly) markets particularly the Castries Market and Vieux Fort Market. Farmers typically directly sell their produce to local consumers on Friday and Saturday shopping days. These markets operate with minimal services, storage, grading, sorting, or weighing requirements. They feature a diverse product range that is highly variable because of the importance of seasons on rain-fed farming. Mostly women, vendors typically have small farms, or are members of farm families with responsibility for the sale of household produce, or small-scale 'middle-men'. Municipal councils are responsible for the farmers markets in the respective city/town with spaces rented daily, by ticket (average cost \$2 USD). Market facilities have minimum storage area with produce sold in ambient air temperatures.

### 3.2.4. Interactions and outcomes

In the 1950–2010 period (see Table 2), state-led policies transformed rules undermining common understanding (community interactions and collective action) that previously guided domestic production systems. While all categories of ex-sugar actors in the post-1950s period entered banana production, it was the loss of the ex-subsistence farmer group that most affected rule development, interactions and outcomes in the domestic market. Since the other actors had played a lesser role in domestic markets, rule development post-1950s paralleled the changing relations between ex-subsistence farmers in their new role as independent smallholder farmers in the export market.

In the absence of boundary rules to guide domestic production volumes and protect marginal land use, ex-subsistence producers



exited domestic production in droves, deforested hillslopes and replaced them with banana plants (see Table 2 1950–2010 columns). Post-1950, these changes led to agricultural production on ill-suited steep slopes with negative environmental consequences (Cox et al., 2005; Rojas et al., 1988). With changing relations between ex-subsistence farmers in their new role as independent smallholder farmers, information sharing rules bolstered by informal institutions became less relevant and social networks became more fragmented. New scope and choice rules emerged as competition, autonomy, and increased output replaced subsistence production with increased disaggregation of producers. As large tracts of land became allocated to monoculture bananas, lands under food production in the domestic market were drastically reduced. To illustrate, the total area of agricultural holdings primarily allocated to banana production, stood at 35,000 ha in 1961 and post trade liberalization it declined to 12,000 ha (in 2007), a 66% decrease in export bananas (GOSL, 2007). The diversion of human and land resources towards export-oriented food production reduced domestic fresh food production volumes and the consistency of their supply, creating a looming food and nutrition security challenge that was not immediately apparent because of the increased household incomes from the banana cash crop economy and easy availability of imported foods (Saint Ville et al., 2015). Food imports in Saint Lucia have been increasing steadily and were estimated at \$127 US million in 2012 (GOSL, 2013).

Rule convergence in formal and informal institutions helps explain the existing resource management challenge in domestic markets in the post-trade liberalization period. While land acreage and the actors exited export-banana markets and re-entered fresh food production for the domestic market, the 'new' agreed upon rules proved inadequate to foster collective action as each entrant to production in the domestic market decreased the overall welfare of all producers. Our key informants repeatedly described the challenges of managing their production as a result of: supply gluts, high variability in prices, and high rate of food spoilage. Additionally, while the influx of ex-banana farmers to domestic markets did not change the rudimentary marketing system, it ironically changed production systems by introducing higher-input agricultural practices, values and norms.

#### 4. Discussion and analysis of change

We can observe two important institutional changes, pre-1950 and from 1950 to 2010, that transformed Saint Lucia's domestic agri-food system as the 'rules of the game' from the plantation or export markets (formal institutions) replaced resource management rules guiding domestic markets (informal institutions). First, displacement of informal institutions to a lower position in the institutional hierarchy, driven by rule convergence in export and domestic markets (see Table 2). Second, reduced interactions arising from this displacement changed relations between ex-subsistence farmers in rural communities. These changes appear to have negatively affected intra-community exchanges (bonding social capital), and opportunities for inter community horizontal knowledge flows (bridging social capital), despite apparent increases in linking social capital (see Fig. 2).

##### 4.1. Displacement of informal institutions to a lower position in the institutional hierarchy, and rule convergence in export and domestic markets

Institutional change has had significant implications for resource use in Saint Lucia. For example, pre-1950 boundary rules of informal institutions for production in domestic markets required community residence that served to aggregate producers

at the community level. With the intensification of banana production post-1950, this was replaced with a minimum land access requirement which allowed anyone with land greater than 0.5ha to enter (and later to exit) export production. Since many people have access to 'family land' in Saint Lucia (which represents 45% of lands) (Crichlow, 1994), this rule change, combined with inadequate coordination mechanisms (needed to foster common understanding of the rules), led to fragmented and uncoordinated agricultural production systems.

Growing heterogeneity among community members resulted from differences in farmers being able to access and benefit from export production opportunities. Banana farmers contained a mixed group comprising ex-sugar planters, ex-metayers, ex-workers and ex-subsistence farmers. These differences in resources, interests and roles weakened cooperation and common understanding between banana farmers as a group. However, it was the changing relations between ex-subsistence farmers that most affected rule development, interactions and outcomes in the domestic market and community members. Negative feedback from growing heterogeneity further decreased needed interaction to develop common understanding among smallholder farmers (independent banana farmers), which negatively affected their collective participation in community institutions (such as Helping Hands). Further, community members with access to family land were often unable to access credit facilities and were therefore more dependent on informal community institutions (such as labour sharing) (see De Soto, 2000), which served to widen economic disparities. As explained by one retired farmer from Micoud:

[Y]ou had a homogeneous society years ago; everybody was on the same level. So, it's like saying birds of a feather flock together. We were all the same and we tended to gravitate together and we did things together ... But now, there is more disparity.

As disparities increased, community members who held title for their lands and the better resourced entrepreneurial class (such as ex-metayers) opted out of participating in informal institutions. Their withdrawal was seen by community members as renegeing on their reciprocity obligations and their unwillingness to interact socially or otherwise with the smaller, less-resourced farmers.

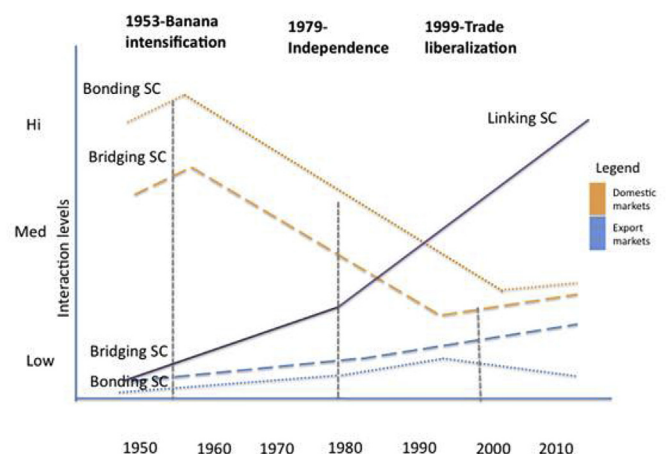


Fig. 2. Changes to the dimensions of social capital (SC) in the agri-food system pre-1950 to 2010 based on interaction levels between actors. Rule convergence in domestic and export markets over the period resulted in reduced intra- and inter community interactions. We show significant declines in bonding and bridging social capital in domestic markets, small increases in bonding and bridging social capital in export markets, alongside significant increases in linking social capital.

Further, as these more business-savvy farmers grew and expanded their production, their need for ongoing interactions with community members through 'identity-development activities' were further reduced, limiting the effectiveness of traditional community sanctions against potential defectors (Schmidt et al., 2001). Ultimately, as the material benefits associated with export agriculture production increased, community-based cooperation was reported to decrease (see Cárdenas and Ostrom, 2004), making collective rule-making and enforcement difficult.

Our results also reveal how rule convergence in both the domestic and export markets post-1950 resulted in domestic markets governed by top-down, monocentric governance systems with state-led control of society, resources and the economy. Such systems have traditionally been associated with exploitative outcomes in Saint Lucia and subsequently suffer from reduced farmer trust in these formal institutions. Initially, social norms maintained racial, social and economic divisions between the minority European planter class (French and British) and more populous citizenry of African origin. Through their role as boundary actors, metayers initially bridged these structural holes and were able to 'be the third who benefits' (Burt, 1992) despite the planter class monopolizing political, legislative, and economic power. Further, a general lack of recognition of the limitations associated with authoritarian and top-down approaches in Saint Lucia appears to have resulted in low importance being placed on informal institutions and community participation in public policy. This has led to the absence of formal efforts to acknowledge existing informal institutions and bridge existing gaps when creating new institutions. As described by a natural resource management specialist:

[W]e're still back in the colonial sort of perspective ... The tendency has been to use command and control rather than ... participatory and adaptive management approaches.

Low levels of participation by citizens in policy processes have led to a general perception that formal institutions lack accountability and transparency. As such, governance is often narrowly defined without the needed focus on broader participation and political inclusiveness. This limited engagement of the populace in policy development undermines the role of the citizenry in the democratic process with focus on outcomes (votes), and opens up a void in the national policy agenda. Further, our interview respondents reported the key roles played by self-interested elites in the formal institutions that govern Saint Lucia's agri-food system, a situation that is likely enhanced by declining group identity and solidarity (Cárdenas and Ostrom, 2004). Adult suffrage in the 1950's gave a voice to the majority Black citizenry through voting, however, the void in the national policy agenda appears to have been filled by Black political elites who supplanted the role of the White planter class. In such a small and isolated population, this division between democratic processes and inputs has enabled a high degree of access to decision-makers and a political environment that has been characterized as 'messianic' (Joseph, 2011). Further, respondents suggested that because of their interactions with politicians, farmers are often able to advance their personal interests rather than those of the collective. As described by a key informant from the Development Bank:

"It is who you know!" He (the smallholder farmer) understands the system ... and what he is doing now, he is systematically exploiting that system for his own advantage ... he hides or has all techniques to get him around his commitments.

Such situations suggest that linking social capital is an

important resource being used to influence formal institutions for individual benefit, undermining their ability to foster collective action on broader community (public) interests. As noted by a respondent from civil society:

.... people have difficulty in really determining where their true loyalties lie. Or where their true interests lie, in terms of what benefits them the most ....

These observations were aptly described by the 1997–1999 Blom-Cooper Commission of Inquiry as a 'culture of corruption' (Blom-Cooper, 1999). In the Commission Report, the author described how this inertia operated in the civil service of Saint Lucia:

I have discerned a culture in St Lucia of studied indifference or, at the very least, inattention to the practice, even the concept, of public accountability - a cultural climate in which administrative torpor is often the consequence, and malpractices in government (including corruption) can thrive, unhampered by detection or, if and when uncovered, by disciplinary action ... The suspicion in the public's mind that the machinery of government is not working, and consequently that corruption is rife, is almost as damaging to the public weal as individual corruption itself (Blom-Cooper, 1999).

Addressing what can be described as the perverse effect of rent-seeking behaviour needs to become a priority of the formal institutions responsible for agri-food policy, in order to better respond to the complex challenges facing Saint Lucia's domestic food system. Here, Hinds (2008) suggested six critical areas that can inform the process of political reform away from the plantation political legacy: 1) pursuit of democratic outcomes rather than inputs; 2) evolved substantive democracy beyond post-colonial forms; 3) mass empowerment and shared nationhood; 4) rethinking of governance with broader participation and political inclusion beyond periodic elections; 5) redefined rules, procedures and elements to include social justice and equality and; 6) expansion of civil rights and liberties to ensure protection against state oppression.

#### 4.2. Reduced interactions negatively affecting bonding and bridging social capital in domestic markets

Through the described rule changes, an unappreciated outcome for the domestic agri-food system was the negative effects on social capital (networks, trust, reciprocity, solidarity) by reduced interactions among social actors (see Fig. 2). Rule convergence in domestic and export markets over the period reduced critical intra- and inter community interactions, reducing opportunities for communities to build symbolic capital and forge new institutions. Findings in other settings have shown that high levels of interaction, particularly at the community level, often serve to reinforce expectation, values and belief (Minato et al., 2010). In the absence of these interactions, bonding and bridging social capital in Saint Lucia's domestic markets appears to have declined. In contrast, in the export market there were increased interactions, although limited rule-based interactions (for example annual general meetings, workshops, etc.), that facilitated minor increases in bonding and bridging social capital among actors.

With the arrival of new institutions, community cohesion (based on intra-community interaction) was reported as declining, with important implications for collective action. As explained by an ex-banana farmer from a major banana producing community;

In a way it (change) was fuelled by bananas because bananas gave the opportunity for those who owned land or had access to land to transform their circumstances almost dramatically ... the entire outlook changed because these people now started hiring help... this community was something like a little New York. People from ... all over, started coming in to this community.

These changes in intra-community interactions resulted in changes in identity and de-legitimized existing community institutions. New rules were in effect that guided the rural community as members participated in export agriculture opportunities. With informal institutional structures facing mass withdrawal of subsistence farmers, self-organized community-based networks (based on principles of equity, reciprocity and accountability) broke down with reduced interactions among actors guided by new rules. For example, previously valued bridging social capital and inter-community interaction became less relevant for agricultural production. Banana farmers now received direct support from workers, SLBGA and WINBAN. As a result, neighbours were no longer able to easily monitor each other's behaviours, and the importance of reciprocal flow of information for joint-activities declined.

Declining bridging social capital in the informal institutions appears to have occurred as intra-community interaction reduced quickly over time. Rapid social change in these communities was reported as undermining the self-organizing institutions that had been functioning in communities through social capital, resulting in institutions based more on competition and rising distrust as social inequality and distances between community members increased. Bonding social capital also appears to have decreased and became consolidated around restricted social networks based on kinship bolstered by interactions around the use of communal lands. Interestingly, as social capital dimensions of bridging and bonding decreased in the domestic production system, linking social capital appears to have increased. Despite these increases over time, the political power associated with universal adult suffrage appeared to not operate as expected (suggesting limited effectiveness of linking social capital) to solve collective action problems in Saint Lucia's agri-food system.

#### 4.3. Policy implications

Better understanding of the effect of public policy/institutions on outcomes for agrarian change in the agri-food system has implications for policymakers, donors and farmer associations. In the case of Saint Lucia, the institutions and common understandings needed to support sustainable resource use in the agri-food system is lacking. The dominant policy focus has been on technological and market conditions, with little consideration of how existing institutional arrangements respond to the need for re-defining formal rules, and social norms away from the plantation legacies (Saint Ville et al., 2017). Ballet et al. (2007) highlights the importance of 'soft skills' rather than technological development in natural resource management by looking at the interplay between linking social capital, cultural and symbolic capital observed in our findings. They describe the need for cultural and structural social capital to be converted into symbolic capital in order to reduce tensions, transaction costs and enhance community-based natural resource management activities. While cultural and social capital allowed resource users to bargain over shared values and rules respectively, it is this process of shared understanding and identity formation that creates symbolic capital. Bourdieu's (1985, 1989) work on symbolic capital used to legitimize rule development in new groups, and Louis' (1981) observations in Saint Lucia on the

importance of identity in creating shared rules appear to support these observations. This suggests that current efforts in community-based natural resource management to build structural social capital by looking at connections between resource users may be insufficient on its own (Saint Ville et al., 2016).

Ultimately, those representing linking social capital (policy-makers, donors and farmer associations) may benefit from building horizontal linkages between social actors in the ongoing efforts to resolve coordination challenges in the food system. Watts and Wandesforde-Smith (2006) describe such initiatives as operating 'under the radar' of formal politics in the Caribbean, but still depends heavily on community-coalitions. Based on past Caribbean successes, they recommend interventions that use existing bridging social capital and good linking social capital to build 'triple alliances' comprising informal, multi-level, multi-scalar, pro-sustainability and pro-participation coalitions. While this approach has already been applied in other natural resource sectors in the region (notably in fisheries, coastal zone and watershed management) (Tompkins and Adger, 2004) it has not been systematically applied to domestic agri-food systems governance. In doing so, we note a caution by Woolcock (1998) that we should recognize dimensions of social capital as "resources to be optimized, not maximized" (p. 158).

#### 5. Conclusion

This study applied a combined PIASES Institutional Analysis and Development and Social–Ecological Systems (SES) framework to investigate how institutions have influenced outcomes in the agri-food system of Saint Lucia. First, displacement of informal institutions and guiding rules to a lower position in the institutional hierarchy resulted in the convergence of rules from export and domestic production systems. Second, these changes fostered reduced interaction, loss of cultural and identity-building activities within and across communities, and a general loss of horizontal linkages between different communities (bridging social capital). Monocentric governance systems inherited from the plantation system, supported by rules that created conditions of low accountability, appear to have weakened the effectiveness of vertical links between different actors in Saint Lucia's agri-food system (linking social capital) to solve collective problems. Collectively these changes transformed domestic agri-food systems, resulting in unintended outcomes such as increasing food and nutrition insecurity, low bridging social capital, and low system diversity.

Going forward, there appears to be a need for public policy to more explicitly and carefully account for the complex institutional legacies and characteristics which continue to affect the sustainable governance of Saint Lucia's agri-food system. Our results suggest the need to better identify bridging institutions in the agriculture sector, perhaps based on an adaptive co-management model, that could support shared rule-making, power and knowledge-sharing amongst policy actors from multiple levels in the governance hierarchy.

#### Acknowledgements

This work was carried out with the aid of a grant from the Canadian International Food Security Research Fund (Project Number 106525-002), a program of Canada's International Development Research Centre (IDRC), Ottawa, Canada, and with the financial support of the Government of Canada provided through Global Affairs Canada. The funding source had no involvement in the conduct of this research. This research was completed as part of a larger project entitled: "Improving the Nutrition and Health of CARICOM Populations". Arlette Saint Ville would like to



acknowledge the additional funding support she received through an IDRC Doctoral Research Award 2013–2014; the Schulich Graduate Fellowship (2011–12) and the Sustainable Agriculture Scholarship 2013–16, McGill University. We are grateful for the support of Dr. Sonia Laszlo, McGill University and sincerely thank the research participants, communities and Saint Lucia Ministry of Agriculture, Food Production, Fisheries, Co-operatives and Rural Development who supported, and donated their valuable time and knowledge to our study.

## References

- Adger, W.N., 2003. Social capital, collective action, and adaptation to climate change. *Econ. Geogr.* 79, 387–404.
- Adler, P.S., Kwon, S.W., 2002. Social capital: prospects for a new concept. *Acad. Manag. Rev.* 27, 17–40.
- Adrien, P., 1996. *Metayage, Capitalism and Peasant Development in St. Lucia 1840–1957*. Jamaica: Canoe Press, University of the West Indies.
- Altheide, D.L., 1987. Reflections: ethnographic content analysis. *Qual. Sociol.* 10, 65–77.
- Ballet, J., Sirven, N., Requier-Desjardins, M., 2007. Social capital and natural resource management a critical perspective. *J. Environ. Dev.* 16, 355–374.
- Becker, H.S., 1996. The epistemology of qualitative research. *Ethnogr. Hum. Dev. Context Mean. Soc. Inq.* 53–71.
- Beckles, H., Shepherd, V., 1996. *Caribbean Freedom: Economy and Society from Emancipation to the Present: a Student Reader*. Ian Randle Publishers, Kingston.
- Blom-Cooper, L., 1999. Commission of Inquiry. Saint Lucia, Castries.
- Bourdieu, P., 1985. The social space and the genesis of groups. *Theory Soc.* 14, 723–744.
- Bourdieu, P., 1989. Social space and symbolic power. *Sociol. Theory* 7, 14–25.
- Brierley, J.S., 1988. A retrospective on West Indian small farming, with an update from Grenada. In: Brierley, J.S., Rubenstein, H. (Eds.), *Small Farming and Peasant Resources in the Caribbean*. The University of Manitoba, Winnipeg.
- Burt, R.S., 1992. *Structural Hole*. Harvard Business School Press, Cambridge, MA.
- Cárdenas, J.C., Ostrom, E., 2004. What do people bring into the game? Experiments in the field about cooperation in the commons. *Agric. Syst.* 82, 307–326.
- Charles, G.F.L., 1994. *The History of the Labour Movement in St. Lucia 1945–1974: a Personal Memoir*. St. Lucia: FRC Publications.
- Chen, H., Wang, J., Huang, J., 2014. Policy support, social capital, and farmers' adaptation to drought in China. *Glob. Environ. Change* 24, 193–202.
- Corthésy, N.G., Harris-Roper, C.A., 2014. *Commonwealth Caribbean Employment and Labour Law*. Routledge, Kentucky.
- Cox, C., Sarangi, A., Madramootoo, C., 2005. Effect of land management on runoff and soil losses from two small watersheds in St. Lucia. *Land Degrad. Dev.* 17, 55–72.
- Crichlow, M.A., 1994. An alternative approach to family land tenure in the Anglophone Caribbean: the case of St. Lucia. *New West Indian Guide/Nieuwe West-Indische Gids* 68, 77–99.
- Darr, D., Pretzsch, J., 2008. Mechanisms of innovation diffusion under information abundance and information scarcity: on the contribution of social networks in group vs. individual extension approaches in Semi-Arid Kenya. *J. Agric. Educ. Ext.* 14, 231–248.
- De Soto, H., 2000. *The Mystery of Capital*. Basic Books, New York.
- Dessie, Y., Schubert, U., Wurzing, M., Hauser, M., 2013. The role of institutions and social learning in soil conservation innovations: implications for policy and practice. *Environ. Sci. Policy* 27, 21–31.
- Elliott, D.R., Palmer, R.W., 2008. Institutions and Caribbean economic performance: insights from Jamaica. *Stud. Comp. Int. Dev.* 43, 181–205.
- Fischer, A., Petersen, L., Feldkötter, C., Huppert, W., 2007. Sustainable governance of natural resources and institutional change—an analytical framework. *Public Adm. Dev.* 27, 123–137.
- Folke, C., 2006. Resilience: the emergence of a perspective for social–ecological systems analyses. *Glob. Environ. Change* 16, 253–267.
- Gauri, V., Lieberman, E.S., 2006. Boundary institutions and HIV/AIDS policy in Brazil and South Africa. *Stud. Comp. Int. Dev.* 41, 47–73.
- Glaser, B.G., Strauss, A.L., 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine de Gruyter, New York.
- GOSL, 1989. *Saint Lucia's Annual Statistics: a Digest Containing Annual Statistics for 1996 and 1997*. Saint Lucia: Government of Saint Lucia.
- GOSL, 2007. *Agricultural Census*. Saint Lucia: Government of Saint Lucia.
- GOSL, 2013. *Food and Nutrition Security Policy and Action Plan*. Saint Lucia: Government of Saint Lucia.
- Greenwood, R., Hinings, C.R., 1996. Understanding radical organizational change: bringing together the old and the new institutionalism. *Acad. Manag. Rev.* 21, 1022–1054.
- Grootaert, C., Narayan, D., Nyhan-Jones, V., Woolcock, M. (Eds.), 2004. *Measuring Social Capital: an Integrated Questionnaire*, World Bank Working Paper No.18. The World Bank, Washington DC.
- Grossman, L.S., 1998. *The Political Ecology of Bananas: Contract Farming, Peasants, and Agrarian Change in the Eastern Caribbean*. The University of North Carolina Press, Chapel Hill.
- Grossman, L.S., 1992. Pesticides, caution, and experimentation in St. Vincent, eastern Caribbean. *Hum. Ecol.* 20, 315–336.
- Guha-Khasnobis, B., Kanbur, R., Ostrom, E., 2007. *Linking the Formal and Informal Economy: Concepts and Policies*. Oxford University Press, London.
- Harmsen, J., Guy, E., Robert, D., 2012. *A History of St. Lucia*. St. Lucia: Lighthouse Road.
- Hinds, D., 2008. Beyond formal democracy: the discourse on democracy and governance in the Anglophone Caribbean. *Commonw. Comp. Polit.* 46, 388–406.
- Hodgson, G.M., 2006. What are institutions? *J. Econ. Issues* 40, 1–25.
- IICA, 1989. *Profiles of Farmer Organization in Saint Lucia*. St. Lucia: Inter-American Institute for Cooperation on Agriculture.
- Joseph, T.S.D., 2011. *Decolonization in St. Lucia: Politics and Global Neoliberalism, 1945–2010*. University Press of Mississippi, Jackson.
- Kode, J., 2013. *On the Social Conditions of Governance: Social Capital and Governance in Areas of Limited Statehood*, SFB-Governance Working Paper Series No. 60. Collaborative Research Centre, Berlin.
- Leeuwis, C., Aarts, N., 2011. Rethinking communication in innovation processes: creating space for change in complex systems. *J. Agric. Educ. Ext.* 17, 21–36.
- Lewis, G.K., 1968. An introductory note to the study of the Virgin Islands. *Caribb. Stud.* 8, 5–21.
- Levitt, K., Best, L., 1975. Character of Caribbean economy. In: Beckford, G. (Ed.), *Caribbean Economy*. Jamaica: Institute of Social and Economic Research, University of the West Indies, pp. 34–60.
- Louis, M., 1981. *An Equal Right to the Soil: the Rise of Peasantry in St. Lucia; 1838–1900*. PhD diss., John Hopkins University.
- Marhatta, H.P., Robbins, R.D., Plummer, L., 1978. *Agricultural Marketing System in St. Lucia: Small Farmer Technology and Marketing Analysis for Rural Development*. A and T State University, North Carolina.
- March, J.G., Olsen, J.P., 1983. The new institutionalism: organizational factors in political life. *Am. Political Sci. Rev.* 78, 734–749.
- Mashavave, T., Mapfumo, P., Mtambanengwe, F., Gwandu, T., Siziba, S., 2013. Interaction patterns determining improved information and knowledge sharing among smallholder farmers. *Afr. J. Agric. Resour. Econ.* 8, 1–12.
- McGinnis, M., 2011. An introduction to IAD and the language of the Ostrom workshop: a simple guide to a complex framework for the analysis of institutions and their development. *Policy Stud. J.* 39, 169–183.
- McGinnis, M., Ostrom, E., 2010. IAD and SES dynamic flows: introducing the program in institutional analysis of social–ecological systems (PIASES) framework (Delft, Netherlands). In: *Preliminary Draft of a Paper to Be Presented at 13th Economics of Infrastructures Conference*.
- McGinnis, M., Ostrom, E., 2012. SES Framework: initial changes and continuing challenges. *Ecol. Soc.* 19.
- McGinnis, M.D., 2013. *Updated Guide to IAD and the Language of the Ostrom Workshop: a Simplified Overview of a Complex Framework for the Analysis of Institutions and Their Development*.
- Minato, W., Curtis, A., Allan, C., 2010. Social norms and natural resource management in a changing rural community. *J. Environ. Policy Plan.* 12, 381–403.
- Monrose, E., 2004. *Can the Banana Industry in Saint Lucia Survive Post 2008: a Critical Look?* PhD diss The University of Birmingham.
- Morgan, D.L., 1993. Qualitative content analysis: a guide to paths not taken. *Qual. Health Res.* 3, 112.
- Murray, D.L., Hoppin, P., 1992. Recurring contradictions in agrarian development: pesticide problems in Caribbean Basin nontraditional agriculture. *World Dev.* 20, 597–608.
- North, D.C., 1991. Institutions. *J. Econ. Perspect.* 5, 97–112.
- Narayan, D., 2002. Bonds and bridges: social capital and poverty. In: Isham, J., Kelly, T., Ramaswamy, S. (Eds.), *Social Capital and Economic Development: Well-being in Developing Countries*. Edward Elgar, Northampton, MA, pp. 58–81.
- O'Loughlin, C., 1968. *Economic and Political Change in the Leeward and Windward Islands*. Yale University Press, New Haven.
- Ostrom, E., Gardner, R., Walker, J., 1994. *Rules, Games, and Common-pool Resources*. University of Michigan Press, Michigan.
- Ostrom, E., 2000. Collective action and the evolution of social norms. *J. Econ. Perspect.* 14, 137–158.
- Ostrom, E., 2009. *Understanding Institutional Diversity*. Princeton University Press, New Jersey.
- Pelling, M., High, C., 2005. Understanding adaptation: what can social capital offer assessments of adaptive capacity? *Glob. Environ. Change* 15, 308–319.
- Rahman, H., Hickey, G.M., Sarker, S.K., 2012. A framework for evaluating collective action and informal institutional dynamics under a resource management policy of decentralization. *Ecol. Econ.* 83, 32–41.
- Rahman, H.T., Sarker, S.K., Hickey, G.M., Haque, M.M., Das, N., 2014. Informal institutional responses to government interventions: lessons from madhupur national park, Bangladesh. *Environ. Manag.* 54, 1175–1189.
- Reed, G., Hickey, G.M., 2016. Contrasting innovation networks in smallholder agricultural producer cooperatives: insights from the Niayes Region of Senegal. *J. Co-op. Organ. Manag.* 4, 97–107.
- Reynolds, A., 2006. *The Struggle for Survival: an Historical, Political, and Socio-economic Perspective of St. Lucia*. US: Jako Books.
- Richardson, B.C., 1992. *The Caribbean in the Wider World, 1492–1992: a Regional Geography*. Cambridge University Press, Cambridge.
- Rojas, E., Wirtshafer, R.M., Radke, J., Hosier, R., 1988. Land conservation in small developing countries: computer assisted studies in Saint Lucia. *Ambio*



- 282–288.
- Royal West India Commission, 1945. West India Royal Commission Report (West Indies).
- Sabatini, F., 2009. Social capital as social networks: a new framework for measurement and an empirical analysis of its determinants and consequences. *J. Soc.-Econ.* 38, 429–442.
- Saint Ville, A., Hickey, G.M., Phillip, L., 2015. Addressing food and nutrition insecurity in the Caribbean through domestic smallholder farming system innovation: a review. *Reg. Environ. Change* 15, 1325–1339.
- Saint Ville, A.S., Hickey, G.M., Locher, U., Phillip, L.E., 2016. Exploring the role of social capital in influencing knowledge flows and innovation in smallholder farming communities in the Caribbean. *Food Secur.* 8, 535–549.
- Saint Ville, A.S., Hickey, G.M., Phillip, L.E., 2017. How do stakeholder interactions influence national food security policy in the Caribbean? The case of Saint Lucia. *Food Policy* 68, 53–64.
- Schmidt, D., Shupp, R., Walker, J., Ahn, T.K., Ostrom, E., 2001. Dilemma games: game parameters and matching protocols. *J. Econ. Behav. Organ.* 46, 357–377.
- Speranza, C.I., 2013. Buffer capacity: capturing a dimension of resilience to climate change in African smallholder agriculture. *Reg. Environ. Change* 13, 521–535.
- Stevenson, T., 1995. Geest Sells Banana Business for Pounds 147m. <http://www.independent.co.uk/news/business/geest-sells-banana-business-for-pounds-147m-1527114.html> (Accessed 16 July 2016).
- Termeer, C.J., Dewulf, A.R.P.J., Lieshout, M.V., 2010. Disentangling scale approaches in governance research: comparing monocentric, multilevel, and adaptive governance. *Ecol. Soc.* 15.
- Timms, B.F., 2008. Development theory and domestic agriculture in the Caribbean: recurring crises and missed opportunities. *Caribb. Geogr.* 15, 101–117.
- Timu, A.G., Mulwa, R.M., Okello, J., Kamau, M., 2012. The role of varietal attributes on adoption of improved seed varieties (Seattle, Washington). In: The Case of Sorghum in Kenya. Agricultural & Applied Economics Association's 2012 AAEA Annual Meeting.
- Tompkins, E.L., Adger, W., 2004. Does adaptive management of natural resources enhance resilience to climate change? *Ecol. Soc.* 9.
- van Rijn, F., Bulte, E., Adekunle, A., 2012. Social capital and agricultural innovation in Sub-Saharan Africa. *Agric. Syst.* 108, 112–122.
- Watts, N.S., Wandesforde-Smith, G., 2006. The law and policy of biodiversity conservation in the Caribbean: cutting a Gordian knot. *J. Int. Wildl. Law Policy* 9, 209–221.
- Welch, B., 1994. Banana dependency: albatross or liferaft for the windwards. *Soc. Econ. Stud.* 123–149.
- Wenger, E., 2010. Communities of practice and social learning systems: the career of a concept. In: Blackmore, C. (Ed.), *Social Learning Systems and Communities of Practice*. Springer, London, pp. 179–198.
- Woolcock, M., 1998. Social capital and economic development: toward a theoretical synthesis and policy framework. *Theory Soc.* 27, 151–208.
- Wossen, T., Berger, T., Mequaninte, T., Alamirew, B., 2013. Social network effects on the adoption of sustainable natural resource management practices in Ethiopia. *Int. J. Sustain. Dev. World Ecol.* 20, 477–483.
- Yin, R., 1994. *Case Study Research: Design and Methods*. Sage Publications, Thousand Oaks.
- Yin, R., 2002. Case study evaluations: a decade of progress? *Eval. Models* 185–193.