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Essays on Smallholder Farmers in Jamaica: Context-specific Evidence for Food Security Policymaking

Deborah Evadne Brown
University of Arkansas, Fayetteville

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Essays on Smallholder Farmers in Jamaica: Context-specific Evidence
for Food Security Policymaking

Essays on Smallholder Farmers in Jamaica: Context-specific Evidence
for Food Security Policymaking.

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Public Policy

by

Deborah Evadne Brown
University of the West Indies (Mona)
Bachelor of Arts in Geography, 1997
University of London, King's College
Master of Arts in Geography, 2004

August 2014
University of Arkansas

The dissertation is approved for recommendation to the Graduate Council.

Dr. J. S. Popp
Dissertation Director

Dr. Eric Wailes
Distinguished Professor

Dr. Jefferson Miller
Committee Member

Dr. John Gaber
Committee Member

ABSTRACT

This dissertation is comprised of three essays that examined the experiences and welfare of traditional food crop farmers in Western Jamaica. It systematically analyses the interplay between smallholder farmers and often overlooked variables in society. The study used qualitative interviewing, field observations and discourse analysis techniques to generate context-specific evidence for food security policymaking.

The first essay examined smallholder farmers' motives for farming. This formed the basis for a farmer typology that provides a portrait of the participants, and was used to inform findings in subsequent essays in this dissertation. The theory of planned behavior provided the conceptual grounding and contributed to an understanding of the heterogeneity identified among the smallholder farming population. The farmer typology, which could be instrumental for bottom-up policymaking and the efficient allocation of resources, can also aid extension services providers and development practitioners to identify a cadre of farmers sufficiently experienced and motivated to participate in national food security outcomes.

Using the typology developed in the previous essay, the second essay explored smallholder farmers' use of information and communication technologies (ICTs) and levels of social capital. The findings showed that mobile phones and radios were used extensively for information and the maintenance of high bonding social capital. However, smallholder farmers lacked proficiency with, and access to internet-based devices. These limitations were reflected in the paucity of wide economic and social networks among farmers in the study area.

The third essay traced the connections between smallholder farmers and the political economy through government discourse. This critical discourse used texts from annual budget

presentations to Parliament (2003- 2013) for a longitudinal study, to identify how smallholder farmers were constructed by policymakers and the extent to which policy initiatives targeted their specific needs. The results showed that agricultural programs and food security policy initiatives, toward smallholder farmers in Jamaica, were erratic. The paper also identified pertinent topics missing from the discourse and concluded that the agenda needs to be broadened to address current and potentially impactful problems that have implications for food security outcomes.

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LIST OF ABBREVIATIONS

ABIS	Agricultural Business Information System
BOJ	Bank of Jamaica
CIDA	Canadian International Development Agency
ECLAC	Economic Commission of Latin America and the Caribbean
EPA	Environmental Protection Agency
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
IICA	Inter-American Institute for Cooperation on Agriculture
ICT	Information and Communication Technology
ICT4D	Information and Communication Technology for Development
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IMF	International Monetary Fund
JAMIS	Jamaica Agricultural Management Information System
KMA	Kingston Metropolitan Area
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MDG	Millennium Development Goal (United Nations)
PIOJ	Planning Institute of Jamaica
RADA	Rural Agriculture Development Authority
STATIN	Statistical Institute of Jamaica
TPB	Theory of Planned Behavior
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WTO	World Trade Organization

CHAPTER 1. GENERAL INTRODUCTION

Introduction

Local food systems in the Caribbean region require revitalization in one way or another, because they experience challenges relating to food availability, food access and food use in their respective societies (Beckford, Campbell & Donovan, 2013; Granderson, Edwards & Pierre, 2012). The extent of regional food insecurity is evident in the dependence of the islands on imported food, their vulnerability to changes in international trade, price volatility and external shocks. Furthermore, the region remains susceptible to natural disasters, increasing international debt and balance of trade, rapid urbanization and changing diets (Arias, 2010; Beckford, 2012; Beckford & Bailey, 2009; Beckford et al., 2013). These and other factors combine to make the issue of food security a very complex social, economic, political, cultural and environmental challenge.

Jamaica is a microcosm of the Caribbean's multifaceted food security problems. The third largest island in the region, Jamaica houses a population of 2.7 million (STATIN, 2013). Its economy is heavily dependent on tourism, remittances and agriculture. The agricultural sector represents the second largest employer of citizens, with 17.6 per cent of the labor force directly employed in 2011. Nationally, the sector contributed 6.6% to GDP in that same year (Planning Institute of Jamaica, (PIOJ), 2012, p.10.1), but Jamaica is a net importer of food.

The importation of food has outpaced exports and placed tremendous strains on national budgets and foreign exchange reserves. Some indicators show Jamaica's consumption levels to be above average, but studies show that small declines or disruptions in regular food supplies or food access can trigger food insecurity. Because the lowest three income deciles are on the cusp

of poverty many Jamaicans are vulnerable to changes in the international arena (Beckford 2012; United States Department of Agriculture (USDA), 2013).

In the Caribbean, and in Jamaica, agriculture plays a vital role in the livelihood of people not only because a large portion of the poor makes their living directly or indirectly from this sector (Conforti 2011); but also because it has a crucial role to play in improving the nations' food security (Beckford, 2012). However, Jamaica is incapable of producing all the food necessary for their consumption because of her small sizes, ecological conditions and changing consumer demands. Therefore, food security will have to be achieved through a balanced approach that combines international trade with an enabling environment which encourages healthy domestic production for traditional crops (See Beckford et al., 2013; Beckford 2012; Beckford & Bailey, 2009; Beckford et al., 2007; Spence, 1999; Weis, 2004).

What is food security?

Food security as concept is flexible (Badu & Sanyal, 2009) and its malleability has led to the evolution of its definition and approaches to its measurement and determination. The *International assessment of agricultural knowledge, science and technology for development (IAASTD): Global report* (McIntyre, Hans Herren, Wakhungu, and Watson, 2009) explained that the concept of food security emerged in international development discourse in the 1960's and 1970s. During that time much of the paradigm shifts in the definition of the concept took place due to the work and advocacy of NGOs and civil societies' movements. Scholars like Fairbairn (2010) and Andersen and Watson II (2011) also credited the seminal work of Amartya Sen for the general shift from thinking about food security in terms of national agricultural

production to considerations emphasizing food entitlements and food access at the household and individual levels.

The following definitions are three of the most widely quoted definitions of food security in the current literature:

United Nations definition:

The World Food Summit of 1996 defined food security as a condition that exist when “all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO, 2012 p. 2).

The USAID definition:

When all people at all times have both physical and economic access to sufficient food to meet their dietary needs in order to lead a healthy and productive life (USAID, 1992, 2010).

The USDA definition:

Access by all people at all times to enough food for an active, healthy life. Food security includes at a minimum: (1) the ready availability of nutritionally adequate and safe foods, and (2) an assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, or other coping strategies) (cited from Gibson, 2012, p. 7).

These oft-repeated definitions of food security share similar tenets; however their overarching goals have remained elusive in many places because of complex and dynamic interactions that present multiple context-specific challenges.

The global food system is comprised of regional, national and local food systems. Analyses of food security are applicable at varying levels of aggregation, thus the unit of analysis used for assessing food security issues, whether at the global, regional, national, community, household or individual level, determines how the food systems will be examined and addressed (IFPRI, 2012; Pinstруп-Andersen & Watson II, 2011). Agriculture is fundamental to food security at all levels of analysis but different levels of aggregation serve to target different

aspects of the concept for progress. The World Bank (2009) for instance, purported that at the global level, food availability is addressed generally and discussions are centered on whether the world is producing sufficient food to feed its inhabitants. However, when food security is analyzed at the national level the country's access to food is assessed, therefore questions regarding national production levels and foreign trade are examined. In this study, food security is examined at the community level from the perspective of small farmers whose provisions make food available for their households and the domestic market.

Agricultural and food security policymaking

Agricultural policies are part of governments' national plans, designed to achieve multiple goals such as food security, improvements in the quality of health and nutrition, equitable distribution of the benefits of agriculture, increased production, and environmental conservation among others. When those goals are achieved, the people and the country will experience a reduction in poverty and food insecurity; improvement of health and nutrition; increased economic growth, and the sustainable management of natural resources among others. Government's role is to facilitate and identify policy options that can guide the achievement of societal goals (Akroyd, 2003; Pinstруп-Andersen & Watson II, 2011). Policies are generally considered the purposeful decisions made by authoritative actors to determine how to allocate the scarce resources within their society for the development of that society (Cochran & Malone, 1995).

Increasingly, agricultural and food policies are featuring more prominently on the agendas of many developing countries. Typically, agriculture-based interventions geared towards increasing productivity and farm outputs, in order to guarantee households' access to food, are sought to address food insecurity and reduce its severity (IFPRI, 2012; Pinstруп-Andersen &

Watson II, 2011). However, policymakers are beginning to recognize that food insecurity can stem from a myriad of other causes. Therefore, it is important for researchers and decision makers to explore other context-specific issues that can present an obstacle to food security.

Context-specific issues for food security policymaking

Contemporary policymakers require evidence-based information for the successful formulation of agriculture policy measures, especially those associated with food security. Context-specific information concerning factors such as technology, socio-cultural trends and governance can have significant influence on the outcomes of the food system (Granderson, Edwards & Pierre, 2012). Progressively, more development practitioners have begun to accept that a strictly economic focus is severely limited in its ability to secure successes under the traditional premise of the market playing the major role in resource allocation. Thus, purposeful attention is now being paid to the relevance of such intangibles as social relationships and the role of social capital in the promotion of development goals (Dirven, 2004). Policymakers will need evidence about new and dynamic combinations of human and natural resources to inform agricultural policies pertinent to food security and other associated problems.

Gaps exist in the knowledge-base related to the food security mosaic. For example, information and communication technologies (ICTs) are increasingly important to agriculture. ICTs have the potential to attract investments and link local activities across sectors and, can lead to the spread and development of local knowledge from the core to the periphery and to the outside world (McIntyre et al., 2009; Schech, 2002). Some scholars (James, 2004; Pinjar et al., 2012) have maintained that the adoption of information technology in agriculture is the key to increasing the effectiveness and efficiency of the agriculture sector.

Numerous studies have examined the impact of ICTs for poverty alleviation (von Braun, 2010); capacity building and empowerment of women (Bonder, 2002; Garrido & Roman, 2006; Saghir, Ashfaq & Noreen, 2009) increased market participation (Molony, 2009; Zanello, 2012); and reduced transaction cost, technological transfer and innovation diffusion (Hoang, Castella & Novosad, 2006; Pinjar, Yusuf, Patil & Naik, 2012; Steinmueller, 2001). However, there is a paucity of qualitative research about what is taking place in particular settings. Few qualitative studies have been done on rural households to explain the adoption and use of ICTs (Bonder, 2002; Gannon, 2008; van Dijk, 2005). In developing countries farmers face problems associated with insufficient information for decision-making that impact negatively on food security plans.

Food security outcomes in developing countries can benefit from the adoption of ICTs by improving the way human and social capitals are effectively employed in the agricultural sector by smallholder farmers. The components of social capital, such as networks that promote information flow and linkages that extend beyond the local farming communities (Tripp, 2006), are key to mitigating some of the challenges facing farmers that ICTs can address (ECLAC, 2011). According to de A. David and Malavassi (2004) the more social capital in a given area the more relationships of trust will be created, at all levels, to facilitate greater access to the information. This is important for enabling rural populations to adapt to the quickening pace of socio-economic, technological, political and other changes in order to increase the chances of achieving sustainable rural development. Policies have a role to play in this regard; they create the incentives and guidance stakeholders will need to achieve desirable results.

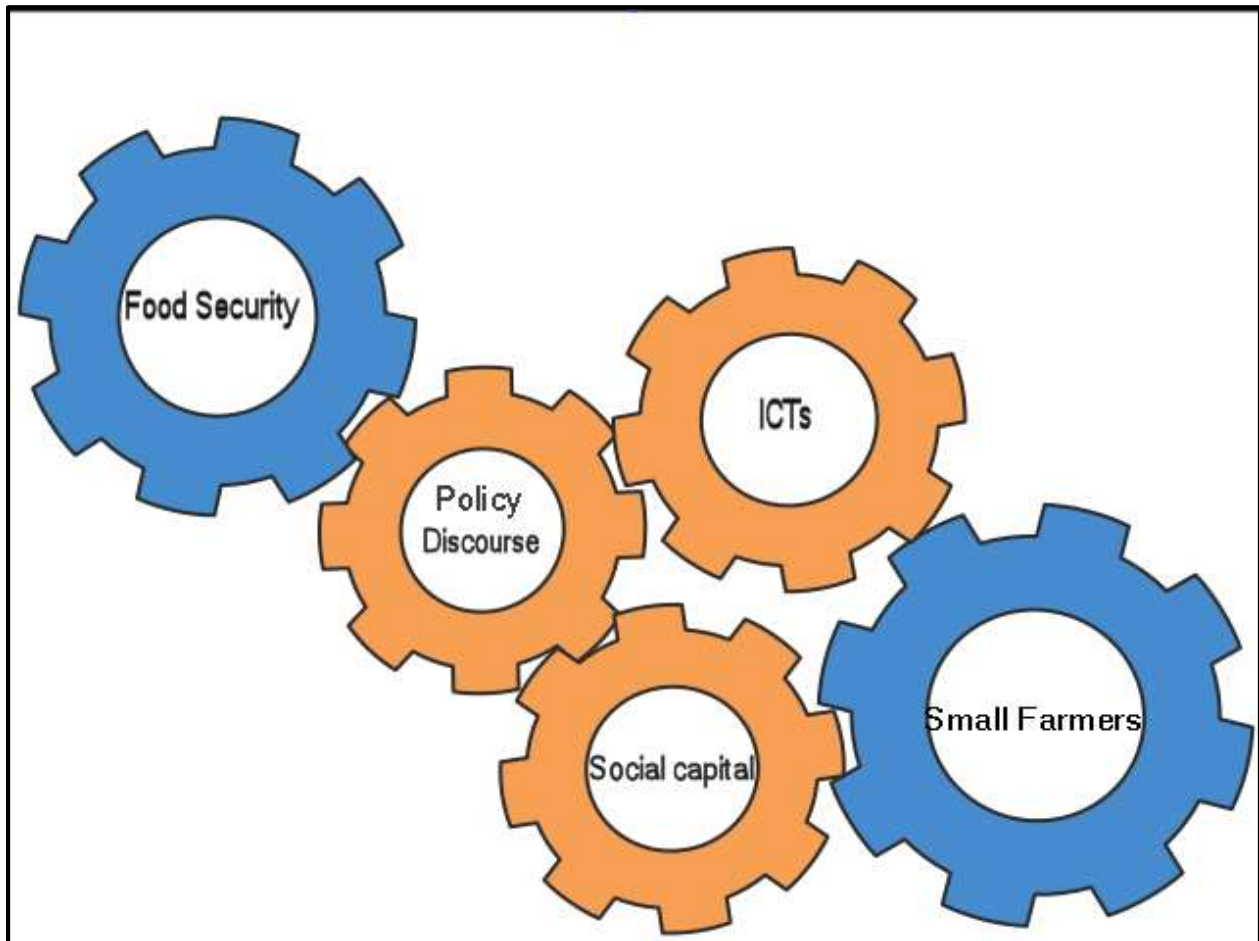
Government are in the business of making public policies (Linder & Peters, 1984), and since policies work through people, both as agents of implementation and as target populations, the choice of policy interventions hinges on assumptions about human motivations (Bosso,

1994). Interestingly, the use of ICTs is as much about motivation as it is about competence and ways of organizing among senders and recipients (Rusten & Skerratt, 2008). This dissertation considers social capital, ICTs in communication networks and the motivations of key stakeholders as important topics for research in food security policymaking. Equally important is an assessment of the governance and sectoral policy discourse that guide outcomes. The synergies among these research topics are discussed in greater detail in this dissertation.

Conceptual framework

Food security policy research sometimes overlooks the full range of social and political dimensions that influence many of the key stakeholders. Many contemporary approaches to the study of food security tend to begin with the biophysical and economic conditions of an area, and treat local knowledge and perceptions as outside of, and reacting to, those conditions (Carr, 2006 p. 21). This research deems the inclusion of local knowledge, in a bottom-up approach, to be invaluable to agricultural policy; as such it seeks to examine factors, other than economic and biophysical, that belie the complex issue of food insecurity in Jamaica. It strives for an understanding of smallholder farmers' motives for their career choice and the extent to which farmers with different motivational orientations harness social capital and use ICTs in their agricultural activities. When an analysis of governance discourse is added in this investigation it elevates the discussion and provides the perspective of another major actor in the food security policymaking arena. The diagram below is a graphic representation of the conceptual framework of this dissertation.

Figure 1.1: Vector gear representation of conceptual framework in dissertation. Adapted from: <http://www.clker.com/inc/svgedit/svg-editor.html?paramurl=/inc/clean.html?id=242017>



The vector gear illustration suggests that the different issues relating to smallholder farmers and food security are dynamic and constantly in motion but opportunities for cooperation exist among different component parts. The diagrammatic representative of this research shows that there are social, governance and technological factors that link food security policymaking with smallholder farmers into an interlocking system. The interplay amongst these important cogs in the engine that drives smallholder farmer agricultural activities is important for the achievement of food security. This framework for interpreting and understanding synergies

among these factors can be used to provide context-specific information and inform food security policy.

Research Questions

The following research questions are a “set of researchable foci” that were used to guide this study (Berg, 2009 p. 26). They encapsulate the information the dissertation is attempting to understand, determine the scope of the study and shape the research (Berg, 2009; Tashakkori & Teddlie, 2010; Hammond & Wellington, 2013). For instance, the following questions were used to generate data for a typology about farmers’ experiences and motives.

1. Why do individuals choose to become traditional food crop farmers?
2. What challenges do smallholder farmers experience in their production of traditional food crops?
3. How can the behavior of smallholder farmers contribute to bottom-up food security policymaking?

In order to compile a more complete portrayal of the smallholder farmer in the study, the following research questions were designed to extend and strengthen the typology:

4. Which ICT tools do smallholder farmers use for accessing agricultural information?
5. What is the evidence of social capital among participants in the study area?
6. To what extent do smallholder farmers’ use of ICTs and social capital contribute to food access and food availability?

The final set of research questions seek to further understand smallholder farmers’ agency and provide policy feedback on the welfare of farmers and the impact of agricultural programs. The questions guide the dissection of sectoral discourse to find out:

7. How are smallholder farmers constructed in government discourse?
8. What are the dominant frames that inform food security policymaking in Jamaica?
9. To what extent are smallholder farmers' agency facilitated and challenges addressed in sectoral governance discourse?
10. Which topics, relevant to food security policy, are missing from the discourse?

Qualitative research in policymaking

A significant part of this research is focused on the lived experiences of smallholder farmers *in situ*. Qualitative research can inform the strategies and definitional problems inherent in determining the population for whom a policy is intended. It interprets the issues from the participants' viewpoint and can uncover salient matters that might be missed by the use of other methods. The systematic evidence generated by qualitative research is an important part of decision making in the policymaking process (Denzin & Lincoln, 2000; Rist, 2000; Tracy, 2013).

Qualitative research values human subjectivity, the range of complex human experiences and the context in which they arise (see, Hesse-Biber, 2010; Rubin & Rubin, 1995). Since policymakers are facilitators of public policies, it is important that the perspectives of ordinary people, for whom public policies have to be tailored, be major participants in decision making. However, without a true understanding of the motives, values, needs, and interests of the specific target populations, it is unlikely that public policies would be effective with such target populations (Wagle, 2000). Therefore, the task of this and other qualitative research is to produce the world through different social lenses that will make a phenomenon or society more

understandable by representing the multivocality therein (Alasuutari, 2010; Denzin & Lincoln, 2000; Tracy, 2013).

Sampling techniques and methods

There has been an increase in the use of qualitative research methods in public policy, mainly because they facilitate the discovery of new levels of knowledge and human experiences (Herzog, 2012). In this dissertation, qualitative interviewing is used in conjunction with field observation in the research design. This special kind of interviewing takes the form of a conversation and is designed to derive interpretations from the respondents (Warren, 2001; 2004; see also Charmaz & Belgrave, 2012).

The qualitative interviewing method used in this dissertation is a critical tool for understanding qualitative features of human experiences, talk, interaction and welfare. It remains a very relevant method of studying aspects of the social world, for instance locating the impact of policy changes in peoples' lived experiences. It is also important to note that qualitative interviewing can be supplemented with other sources of data (e.g. observations and documents) to achieve a more thorough examination of the issue (Brinkmann, 2013; Denzin & Lincoln, 2000; Crow & Edwards, 2013).

Purposive Sampling and Data Collection

Good qualitative researchers, at the very least, engage in purposeful sampling; choosing subjects that fits the parameters of the project's research questions goals and purposes (Tracy, 2013). The snowball sampling technique was used to expand the sample as participants recommended other participants in the area (see Morgan, 2008; Warren, 2001). Qualitative interviews and participant-observation data collection techniques were used in the dissertation.

These qualitative methodologies complement each other, according to Gerson and Horowitz (2002). They posited that observation and interviewing focus on different levels of analysis and thus tend to produce different kinds of findings. Gerson and Horowitz pointed out that observation attends to interactions and evolving situations that takes place in natural settings; while interviews provide a way to uncover motives, meanings and conflicts individuals experience as they respond to challenges in social and interpersonal situations. According to Gerson and Horowitz (2002) , the use of both interviews and observations are integral to any thorough qualitative research, because both methods facilitate a glimpse beyond the surface into the inner workings of the participants' social world.

Overview of the study area and participants

Jamaica is 4244 sq. miles and the country is divided into three administrative counties, Cornwall, Middlesex and Surrey. The country of Cornwall is comprised of the five western-most parishes of Hanover, Westmoreland, Saint James, Saint Elizabeth and Trelawny. According to the 2007 agricultural census, these parishes housed 34% of total farmlands in the country (STATIN, 2008). This area formed the study area for this dissertation, see Figure 2 below.

Figure 1.2: Map of the study area (Brown, (2014) ArcGIS®)



The vast majority of farmers in Jamaica cultivate small plots. In 2007, three-quarters of all farmers produced on plots under two acres (STATIN, 2008). The participants interviewed for this study were smallholder farmers producing traditional food crops on 1-5 acres of mostly marginal lands, located in the hilly interior of the country with poor soil quality, and low or unpredictable rainfall. In Jamaica, these farms play a pivotal role in meeting the food security needs of their communities. However, they are often marginalized, resource-poor and considered less than progressive due to their small plot sizes that are characterized by low external-input and

investment, a lack of access to infrastructure, such as irrigation, good road network, markets, inadequate technical support and limited agricultural information. These conditions result in variable yield and other challenges within the mostly rain-fed food crop producing sector (Beckford, 2012; Beckford et al., 2007; Spence, 1999).

Dissertation Organization

This dissertation aims to examine smallholder farmers' welfare and their capacity to contribute to food security in Jamaica. It seeks to inform bottom-up policymaking through an understanding of the motivational reasoning that exist among the smallholder farmer sub-population. In the next chapter, descriptions of the participants' experiences and motives are detailed and the data used to generate a typology. The farmer profiles in the typology formed the basis for analyzing subsequent findings of this research. Chapter 3 investigates the connections between ICTs, social capital and smallholder farmers' networks. The chapter considers farmers' informational needs, their adoption and use of ICTs to satisfy those needs, as well as the confluences where ICTs and social capital converge to enhance food access and food availability.

Chapter 4 peels back the layers of government discourse to examine how smallholder farmers are social constructed and whether resources are allocated to meet their specific needs. Because the State has always played a role in formulating policy interventions in the agricultural sector in Jamaica, this paper delves into the political economy of food by using the governance discourse to reveal the smallholder farmer and food security policy nexus. The dissertation concludes, in Chapter 5, with a summary of the findings, limitations of the research and recommendations for future studies. The chapter outlines the policy implications of the research

findings and acknowledges the importance of context-specific evidence in the design of sustainable food security policies in Jamaica.

REFERENCES

- Ahmed, B. & Afroz, S. (1996). *The political economy of food and agriculture in the Caribbean*. Kingston, Jamaica: Ian Randle Publishers.
- Akroyd, H. D. (2003). *Agriculture and rural development planning: A process in transition*. Hampshire, England: Ashgate Publishing Ltd.
- Alasuutari, P. (2010). The rise and relevance of qualitative research. *International journal of social research methodology* 13(2), 139–155.
- Arias, J. (2010). The contribution of Agriculture to sustainable development in Jamaica. Inter-American Institute for cooperation of Agriculture (IICA). Retrieved from <http://orton.catie.ac.cr/repdoc/A6027I/A6027I.PDF>
- Badu, S.C. & Sanyal, P. (2009). *Food security, poverty and nutrition policy analysis: Statistical methods and applications*. Burlington, MA: Academic press.
- Beckford, C., Barker, D., & Bailey, S. (2007). Adaptation, innovation and domestic food production in Jamaica: Some examples of survival strategies of small-scale farmers. *Singapore Journal of Tropical Geography* 28, 273 -286.
- Beckford, C. & Bailey, S. (2009). Vulnerability, constraints and survival on small-scale food farms in southern St. Elizabeth, Jamaica: Strengthening local food production systems. In, D. McGregor, D. Dodman & D. Barker (Eds.), *Global change and Caribbean vulnerability: Environment, economy and society at risk*, (pp. 218-236). Kingston, Jamaica: University of the West Indies press.
- Beckford, C. (2012). *Issues in Caribbean food security: Building capacity in local food production systems, food production -approaches, challenges and tasks*, Prof. Anna Aladjadjian (Ed.), Retrieved April, 2013 from: <http://www.intechopen.com/books/food-production-approacheschallenges-and-tasks/issues-in-caribbean-food-security-building-capacity-in-local-food-production-systems>.
- Beckford, C. L. & Campbell, D.R. (2013). *Domestic food production and food security in the Caribbean: Building capacity and strengthening local food production systems*. Gordonsville, VA: Palgrave Macmillan.
- Berg, B. (2009). *Qualitative research methods for the social sciences*. Boston, MA: Pearson Education Inc.

- Brinkmann, S. (2013). *Understanding qualitative research: Qualitative interviewing*. Carry, NC: Oxford University Press.
- Bosso, C. (1994). The practice and study of policy formation. In, S. Nagel (Ed.), *Encyclopedia of policy studies* (pp. 95-115). New York, NY: Marcel Decker, Inc.
- Carr, E. R. (2006). Postmodern conceptualizations, modernist applications: Rethinking the role of society in food security. *Food policy* 31(1), 14-29.
- Charmaz, K. & Belgrave, L. L. (2012). Qualitative interviewing and grounded theory analysis. In, J. Gubrium, J. Holstein, A. Marvasti & K. McKinney (Eds.), *The sage handbook of interview research: The complexity of the craft* (pp. 347-365). Thousand Oaks, CA: Sage Publications Inc.
- Cochran, C.L. & Malone, E. F. (1995). *Public policy: perspectives and choices*. United States of America: McGraw-Hill Inc.
- Conforti, P. (Ed.)(2011). *Looking ahead in world food and agriculture: Perspectives to 2050*. Rome, Italy: Food and Agriculture Organization of the United Nations.
- Crow, G. & Edwards, R. (2013). *What is qualitative interviewing?* London, Great Britain: Bloomsbury Publishing.
- De A. David, M. B. & Malavassi, L.M. O. (2004). Social capital and rural policies: starting point or finishing point? In, R. Atria, M. Siles, I. Arriagada, L. Robison & S. Whiteford (Compilers) *Social capital and poverty reduction in Latin America and the Caribbean: Towards a new paradigm* (pp. 421-460). Santiago, Chile: United Nations and European Commission for Latin America and the Caribbean (ECLAC).
- Denzin, N. K. & Lincoln, Y. S. (2000). Introduction: The discipline and practice of qualitative research. In, N. Denzin & Y. Lincoln (eds.), *Handbook of qualitative research* (pp. 1-28). Thousand Oaks, CA: Sage Publications, Inc.
- Dirven, M. (2004). Between the ideal and the real: social capital and agricultural development, some notes for reflection. In, R. Atria, M. Siles, I. Arriagada, L. Robison & S. Whiteford (Compilers) *Social capital and poverty reduction in Latin America and the Caribbean: Towards a new paradigm* (pp. 371-314). Santiago, Chile: United Nations and European Commission for Latin America and the Caribbean (ECLAC).
- Economic Commission of Latin America and the Caribbean (ECLAC) - (Food and Agriculture Organization (FAO) - Inter-American Institute for Cooperation on Agriculture (IICA). (2011). *The outlook for agriculture and rural development in the Americas: A perspective on Latin America and the Caribbean 2011-2012*. Retrieved from http://www.eclac.org/publicaciones/xml/6/44826/Perspectivas_agricultura2011_ingles-web.pdf
- Fairbairn, M. (2010). Framing resistance: International food regimes & the roots of food sovereignty. In, H. Wittman, A. Desmarais & N. Wiebe (Eds.), *Food sovereignty*:

- reconnecting food, nature and community* (pp. 15-32). Nova Scotia, Canada: Fernwood publishing.
- Food and Agriculture Organization of the United Nations. (2012). *Good practices in building innovative rural institutions to increase food security*. Rome, Italy: FAO.
- Gerson, K. & Horowitz, R. (2002). Observation and interviewing: Options and choices in qualitative research. In, T. May (Ed.), *Qualitative research in action* (pp. 199-224). Thousand Oaks, CA: Sage Publications Inc.
- Granderson, I., Edwards, A. & Pierre, M. (2012). Sustainable nutrition practices for the Caribbean. In, W. Ganpat & W. Isaac (Eds.) *Sustainable food production practices in the Caribbean* (pp. 371–386). Kingston, Jamaica: Ian Randle Publishers.
- Hammond, M., & Wellington, J. J. (2013). *Research methods: The key concepts*. London: Routledge.
- Herzog, Hanna. (2012). Interviewing location and its social meaning. In, J. Gubrium, J. Holstein, A. Marvasti & K. McKinney (Eds.), *The SAGE handbook of interview research: The complexity of the craft* (pp. 207–217). Thousand Oaks, CA: Sage Publications Inc.
- International Food Policy Research Institute (IFPRI). (2012). The food system: A new conceptual framework. Discussion paper 01166, Development strategy and governance division. Retrieved from <http://www.ifpri.org/sites/default/files/publications/ifpridp01166.pdf>
- Linder, S. H. & Peters, B.G. (1984). From social theory to policy design. *Journal of Public Policy* 4(3), 237-59.
- McIntyre, B., Hans Herren, J., Wakhungu, J. & Watson, R. (Eds.). (2009). *Agriculture at the crossroads: International assessment of agricultural knowledge, science and technology for development (IAASTD): Global report*. Washington DC: Island Press.
- Morgan, D. (2008). Snowball sampling. In L. Given (Ed.), *The SAGE encyclopedia of qualitative research methods*. (pp. 816-817). Thousand Oaks, CA: SAGE Publications, Inc.
- Pinjar, B.S., Yusuf, M., Patil, S.I., & Naik, B.K. (2012). Information technology in agriculture development- need and scope. *Agriculture update* 7(1-2), 142-146.
- Pinstrup-Andersen, P. & Watson II, D. D. (2011). *Food policy for developing countries: The role of government in global, national and local food systems*. Ithaca, New York: Cornell University Press.
- Planning Institute of Jamaica (PIOJ). (2012). *Economic and social survey of Jamaica: 2011*. Kingston, Jamaica: Planning Institute of Jamaica.
- Rist, R. C. (2000). Influencing the policy process with qualitative research, In, N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (pp. 1001–1017). Thousand oaks, CA: Sage publications Inc.

- Rubin, H. J. & Rubin, I. S. (1995). *Qualitative interviewing: The art of hearing data*. Thousand Oaks, CA: Sage publications Inc.
- Rusten, G. & Skerratt, S. (2008). Being Rural in a digital age. In, G. Rusten & S. Skerratt (Eds.), *Information and communication technologies in the rural society: Being rural in a digital age* (pp. 1-15). New York, NY: Routledge.
- Saghir, A., Ashfaq, M. & Noreen, A. (2009). Gender and information and communication technologies (ICTs). *Journal of Animal and Plant Sciences*, 19(2), 94-97.
- Schech, S. (2002). Wired for change: The links between ICTs and development discourses. *Journal of International development* 14, 13-23.
- Spence, B.A. B. (1999). Spatio-Evolutionary model of Jamaica small farming. *The Geographical Journal* 165(3), 296-305.
- Statistical Institute of Jamaica (STATIN). (2013). Population of Jamaica. Retrieved from http://statinja.gov.jm/Demo_SocialStats/population.aspx
- Statistical Institute of Jamaica (STATIN). (2008). *Agriculture census: Jamaica 2007*. Kingston, Jamaica: Planning Institute of Jamaica.
- Tashakkori, A. & Teddlie, C. (2010). Putting the human back in “Human research methodology:” The researcher in mixed methods research. *Journal of mixed methods* 4(4), 271- 277.
- Tracy, S. J. (2013). *Qualitative research methods: collecting evidence, crafting analysis, communicating impact*. Somerset, NJ: Blackwell Publishing Ltd.
- Tripp, R. (2006). *Self-Sufficient agriculture: Labour and knowledge in small-scale farming*. London, UK: Earthscan.
- United States Department of Agriculture (USDA). (2013). International food security assessment, 2013 – 2023. Retrieved from <http://www.ers.usda.gov/publications/gfa-food-security-assessment-situation-and-outlook/gfa->
- Van Huylenbroeck, G., Wim, V., & Lauwers, L. (Eds.). (2004). *Role of Institutions in rural policies and agricultural markets*. San Diego, California: Elsevier Inc.
- Wagle, U. (2000). The policy science of democracy: The issues of methodology and citizen participation. *Policy sciences* 33, 207-223.
- Warren, C.A.B. (2004). Qualitative interviewing. In M. Lewis-Beck, A. Bryman & T. Liao (Eds.) *The SAGE encyclopedia of social science research methods*, Vol. 2, (pp. 521-524). Thousand Oaks, CA: Sage Publications Inc.
- Warren, C.A.B. (2001). Qualitative interviewing. In, J. Gubrium & J. Holstein (Eds.), *Handbook of interview research: Context and method* (pp. 83-101). Thousand Oaks, CA: Sage Publications Inc.

Weis, T. (2004). (Re-)Making the case for land reform in Jamaica. *Social and economic studies*, 53(1), 35-71.

World Bank. (2007). *World development report 2008: Agriculture for development*. Washington DC: The International Bank for Reconstruction and Development / The World Bank

World Bank. (2009). *Gender in Agriculture: Sourcebook*. Washington, D.C.: The World Bank.

CHAPTER 2. UNDERSTANDING SMALLHOLDER FARMERS' MOTIVES: EVIDENCE FOR BOTTOM-UP FOOD SECURITY POLICYMAKING

Abstract

Food security and agriculture are inextricably linked in the efforts to achieve the United Nations' Millennium Development Goal (MDG) of reducing the proportion of people who suffer from hunger by half by 2015. Food insecure countries, such as Jamaica, need to identify a corps of traditional crop farmers, sufficiently driven, to consistently achieve high productivity and invest in farming to expand and modernize their activities. Drawing from the theory of planned behavior for conceptual grounding, this study used qualitative methods to examine the motives and reasons for smallholder farmers' work choice. It illuminates the experiences of smallholder farmers in Jamaica ($N=42$) to reveal their motives, successes and constraints. The data, which can be used for bottom-up policy formulation, indicate that small farmers in Jamaica experience similar agricultural challenges, but there is greater heterogeneity regarding their motivational orientations. A typology of smallholder farmers' produced four discernable farmer sub-populations. This study provides context-specific profiles and information about the complex social, economic and cultural interactions that result in choice of farming as a career. Importantly, this typology generates evidence that can help guide the refinement of food security programs, extension services and policy interventions to better target heterogeneous clientele. This characterization of farmers can serve to add depth and background to discussions about the efficient allocation of scarce resources within the traditional food crop sector.

Note on orthography; This manuscript retains the vernacular of the participants in the form in which it was spoken. This form reflects extensive use of the Jamaican dialect, termed locally as "patois". Although the participants were interviewed using Standard English their responses

may appear to contain slight distortions in pronunciation and inaccurate grammatical structures to readers.

Keywords: food security, bottom-up, smallholder farmers, motives

Introduction

In the aftermath of the world food crisis of 2008, many countries are struggling to develop innovative policy responses to address the issue of food insecurity. In Jamaica and the Caribbean, the high debt to GDP ratio, increasing urbanization, the loss of traditional export markets and a burgeoning food import bill are just some of the problems policymakers have to consider in their attempts to find solutions to the complex issues which portend a deleterious national and regional food security problem. Smallholder farmers are major stakeholders in the milieu because they represent the backbone of the domestic agriculture sector.

In developing countries, a bottom-up orientation is particularly relevant for food security policy interventions because their agricultural systems are finely tuned to local conditions and therefore, there are unique conditions to be considered at each farm's locale (Horton, 1998). The perspectives of farmers and the dynamics of their situations are relevant to the planning and execution of policies in the sector. The main thrusts of a bottom-up approach to decision making stem from utilizing the knowledge of actors, valuing their interactions and having an understanding of the complex interplay of different local level situations, in a specific sector (Sabatier, 1986). To ignore or devalue this information that can be generated from the "bottom" can be perilous because this information has the potential to lead to policy objectives that are poorly designed or contradictory as Grant (2006) pointed out. The need to introduce new

context-specific evidence using a bottom-up orientation to the policymaking process is the purpose of this paper. It examines the motives and experiences of small farmers for evidence that will serve to inform policies, strengthen extension services, and improve domestic production and food security outcomes.

It is important to explore the reasons farmers engage in farming in order to provide context-specific evidence to decision makers who are seeking to facilitate increased agricultural productivity and improved food security. For the same reason, it is important to examine farmers' current situations with special attention to practices and policies that lead to success as well as barriers that prevent farmers from achieving sustainable success. However, because small farmers in Jamaica are not a homogeneous group, this paper suggests that an acknowledgement of the heterogeneity among smallholder farmers and their current challenges and successes can result in a more effective and efficient allocation of resources through targeted programs and policies. To provide an understanding of the study an overview of crop agriculture in Jamaica, with a description of the study area and the research participants, is followed in the next section by the research design. The results are analyzed and the findings are presented in the conclusion.

Jamaica's agro-ecosystems are comprised of such staples as breadfruit, banana and plantain; root crops such as yams, sweet potato, dasheen and cassava; fruits such as the ackee, coconut, sorrel, mangoes and avocados; vegetables including callaloo and pumpkin and condiments like hot pepper, thyme and scallions (Beckford et al., 2007; Houston, 2005; Innerarity, 1996; Spence, 1999). These types of crops have adapted to unique ecosystems, are deeply entrenched in traditional foodways and are staples that contribute to Jamaicans' daily

caloric intake (Bondoo, 2012; Sefa-Dedeh, 2003; see also Ramakrishnan, 2001; Hills, 1988 for discussion on tropical agriculture).

Agriculture continues to play a major role in rural development in Jamaica. Local farmers have a stake in maintaining traditional crop diversity and increasing access and availability to these foods. In 2011 it was the second largest employer of citizens with 17.6% of the labor force, and nationally, it contributed 6.6% to GDP (Planning Institute of Jamaica (PIOJ), 2012, p.10.1). But food crop agriculture in Jamaica, as in many other places around the world, faces many uncertainties. Jamaican smallholder farmers face competition from non-farm activities for land and labor, cheaper food imports, and increasingly, the vagaries of the weather due to climate change (Beckford et al., 2007; See also World Bank, 2007).

Heterogeneity among smallholder farmers

Empirical evidence and conventional wisdom, suggest that the more homogeneous the characteristics of agricultural producers are, the more effective growth and interventions are likely to be (López, 2007). Although smallholder farmers face similar challenges, they are not a homogeneous group. Smallholder farmers harbor different reasons for becoming farmers and have different priorities. Their multiplicities of identities are shaped by social, economic and cultural factors, occupational motives, challenges and opportunities (Aitchison & Aubrey, 1982; Fan, Brzeska, Keyzer & Halsema, 2013; Pinstup-Andersen & Watson II, 2011; Vik & McElwee, 2011). The World Bank (2007) identified the pervasive heterogeneity among small farmers as one of the single most important factors that can have serious implications for national policies seeking to leverage agriculture for economic development and improved food security.

Increasingly, the literature on agriculture is embracing heterogeneity among farmers as an important construct that can inform policy. This acceptance among policy experts comes with the understanding that the diversity reflects norms within a community which is critical for agricultural planning (Alsos, Ljunggren & Pettersen, 2003; Barnes & Toma, 2012). Spence (1999) accurately noted that a prerequisite for the formulation of successful initiatives, which are geared towards agricultural development in Jamaica, must be the recognition of the dynamics that underscore small scale farming. A part of the dynamics is an understanding of the reasons smallholder farmers in Jamaica choose to farm. This knowledge is crucial to the formulation of programs, projects and policies, which should be designed with the differences of target sub-groups in mind. Policy needs and policy responses are differentiated depending on who is targeted and where they are located. The recognition that homogeneous policy initiatives would affect individuals in different ways is important, even though some scholars caution that policy (Pike, 2008; Pinstруп-Andersen & Watson II, 2011; Ravallion, 2003).

Over the past decade, researchers have used a typological approach in agricultural research to make a variety of different distinctions among farmers. Barnes and Toma (2012) used a typology to categorize Scottish dairy farmers' attitude toward climate change and, Hayati and Karami (2005) cataloged Iranian farmers' perceptions of the causes of poverty and made recommendations for poverty alleviation strategies. The classifications of small-scale farming in Jamaica have been done according to farm sizes and types of production and market orientations (Beckford et al., 2007; Weis, 2001); by soil type and associated mixed or specialized production; and by owner or tenant tenure (Beckford & Barker, 2007; Spence, 1999); and by farmers' attitude and resource base (Meikle-Yaw, 2005). Burton (2004) proposed the formation of

typologies of similar-thinking farmers. Burton's approach is used in this paper to identify smallholder farmers with comparable motives for their occupational choice.

The reasons farmers actually participate in farming are seldom given much attention; therefore, an understanding of the root causes underlying the diversity among small farmers is never fully examined or viewed as a potential tool for improving food security policymaking. A typological approach supports diversified intervention strategies that would enable policymakers to engage in more cost-effective targeting of smallholder farmers and provide a clear understanding of the target group. This paper delves into the experiences and motivational orientations of Jamaican smallholder farmers to make a contribution to the literature about the heterogeneity among the farming population and how this kind of bottom-up information may add greater precision and efficiency to food security policy interventions and policy initiatives.

Research Design

In-depth interviews and participant observations were methods used for this study. Forty-two participants ($N=42$) from farming communities in the interior of five parishes in western Jamaica were interviewed during a six-week period from December 2012 to January 2013. Figure 1 below shows the study area where interviewees were recruited using a snowball sampling procedure (Crow & Edwards, 2013; Morgan, 2008). The participants were further screened to generate both a theoretical and a purposive sample by selecting cases that fit the parameters of the research (Crow & Edwards, 2013; Tracy, 2013). The criteria for selection were the cultivation of a two to five-acre farm and production of traditional food crops with a marketable surplus for domestic sale. These farmers represent a key source of country-specific data that are necessary for bottom-up food security policymaking.

Figure 2.1: Map of Jamaica showing study area (Brown, 2014, ArcGIS®)



The theory of planned behavior (TPB) is a behavioral choice model that is prevalent within agricultural research due to its potential to provide an effective way for policymakers to understand some of the non-economic issues which influence farmers' behavior, intentions and decision making (Edward-Jones, 2006; Pennings & Leuthold, 2000). The model states that an individuals' behavior is tied to their intention to engage in that behavior (see Ajzen & Fishbein, 1980; Ajzen & Madden, 1986; Fielding, Terry, Masser & Hogg, 2008; Hansson, Ferguson & Olofsson, 2012; Kauppinen, 2010; Matheieson, 1991) and provides the conceptual framework for this research.

The in-depth interviews were conducted individually, tape recorded and later transcribed verbatim. The transcripts and field notes were coded using NVivo 10, a software product line of Qualitative Research International (QSR, 2012). NVivo was chosen because it facilitated the organization of data using open coding, axial coding and constant comparative methods of coding that allowed for the exploration of relationships at the individual and group levels (Robson, 2011). Emergent themes resulting from the axial coding generated a typology of Jamaican smallholder farmers based on their motivational orientation for engaging in farming.

Results

All participants ($N=42$; 26 women and 16 men) gave responses to the question “why did you decide to become a farmer?” The responses to this question weighed heavily in the formulation of the following smallholder farmers’ typology. However, other attitudinal constructs were also identified in the farmers’ comments and responses to other questions. The responses revealed the farmers’ account and justification for their motivational orientations were varied and tied to different behaviors.

The research yielded detailed self-reported reasons for work choice, success stories and challenges experienced by smallholder farmers. These inter-related characteristics formed a tapestry of motives showcasing the diversity that exists among the farmers in the area. Four types of farmers were identified and given names that best captured dominant attributes expressed by those participants. These categories are not exhaustive and neither are the divisions discreet. Some amount of overlapping exists: however, discernable differences within the self-reported explanations could be distinguished. Pike (2008) likened categories in a typology to the color bands in a rainbow where the transition between colors is blended, but it is still possible to distinguish the exact color. Table 1 summarizes the heterogeneous motives and characteristics of smallholder farmers who engage in traditional food crop agriculture in western Jamaica. The group with the largest number of smallholder farmers called the sustainers ($N=13$). The go-getters and stalwarts ($N=11$) had equal numbers of participants, and the entrepreneurs ($N=7$) completed the typology.

Table 2.1: Typology of smallholder farmers in western Jamaica

	SUSTAINERS	GO-GETTERS	STALWARTS	ENTREPRENEURS
NUMBER OF CASES	13	11	11	7
BASIS OF MOTIVATION	Survival	Household security Autonomy	Tradition; culture; rural lifestyle.	Profit
CHARACTER-ISTICS	<ul style="list-style-type: none"> • Possess limited education and other marketable skills • Perceive of farming as a last resort; they have no options or alternate job choice • Earn low income from other jobs • Desire to be productive and to avoid being idle 	<ul style="list-style-type: none"> • Embrace the role of being one's own boss • Manage all aspects of their activities -self-reliant • Independence; (women seek to be independent of men) • Self-employed (earn own income) 	<ul style="list-style-type: none"> • Carry on a family tradition • Feel a sense of pride from farming • Value community • Love to grow plants and enjoy nature • Well-known in the community for providing food 	<ul style="list-style-type: none"> • Possess formal agriculture education and training • Choose farming as a career • Take a business-like approach to farming (assess risk, profit and loss in decision-making)

According to the findings, *sustainers* are participants who decided to grow traditional food crops because they considered farming to be their sole means of survival, something that has kept them from being idle and which they pursued as a last resort. An example of a *sustainer* in this study is the male respondent who explained that after suffering repeated injuries to his eyes, as a welder, he was no longer able to perform in that job, so instead of sitting at home being idle he decided to plant some crops to earn an income and provide food for his family. He explained that farming was not his first choice but he felt he needed to be doing something to occupy his time. Other *sustainers* include a woman who echoed the orientations of others in this category. She posited that:

When you don't have no education, you affi [have to] try and do something fe yuself [for yourself]. You cyah [cannot] just get up every-day and fold yuh [your] hands so...Mi do farming so dat mi [so that I] can eat and survive. (*Sustainer*, female, age 60-69)

Food crop agriculture for these participants represents “something to fall back on” or something they do instinctively to survive. These smallholder farmers believe, whether real or perceived, that there are no other options available to them because they have few other marketable skills due in part to their low educational achievements. *Sustainers* tend to grow the food crops they like to eat and those which grow easily in the area. They earn a living hustling, and selling surpluses locally, often times inconsistently. They are the primary source of labor on their farms and rarely employ paid laborers. Women who fall in this group supplement their income by doing part-time work as care-givers or household helpers. Both men and women rear a few animals such as pigs, goats, and/or, chickens which are generally sold to provide extra living expenses.

Go-getters expressed a desire to be self-reliant, to be their own bosses, and the female respondents repeatedly declared the need to have their own money as their impelling motives for pursuing crop agriculture. One participant from this category stated succinctly:

It [farming] makes me not dependent and no one can push mi 'round [me around] and tell me when to work. (*Go-getter* male, age 60-69)

One woman pointed out that she started out in farming to assist her husband but that she later decided to cultivate her own farm because it afforded her greater independence and household security. *Go-getters* are predominantly vegetable farmers but they also produce small quantities of some traditional staple crops. They are intimately involved in the marketing and distribution of their products and prefer to engage in the direct sale of their produce to the consumer. They are unwilling to sell to middle-men because they are motivated by the prospect of financial independence and controlling the terms of their employment. The work on the farms of these smallholder farmers is done by the farmer with assistance of family members and paid day-laborer as the various activities dictate. Similar to the *sustainers*, *go-getters* raised animals to supplement their income. Chickens and pigs are the most popular animals reared. The *go-getter* smallholder farmer in Jamaica also has other sources of off-farm income such as remittances, profit from a small shop, a street side stall or proceeds from a personal automobile that doubles as an unofficial taxi at nights.

One third of farmers were *stalwarts*, found to be driven by their love of nature, an affinity for a rural life style and an innate commitment to their local community. Many *stalwarts* cited childhood memories about farming as their motivation for becoming farmers. They carry with them a strong sense of responsibility, which they credit to the influence of their parents and an early induction into farming activities. The *stalwarts* hold that growing up in a farm family and

witnessing first-hand the overall commitment and contributions farmers made to life in the local area influenced their decision to be farmers. *Stalwarts* choose to become farmers and pride themselves on being providers of food. One participant with 38 years of farming experience fondly recalled that during his childhood almost all the food for his family came from his father's farm. Because the farm was able to provide food and money for the entire family, he therefore, decided to pursue the same career as his father. Another participant elaborated in a typical Jamaican lilt:

Yuh whey [did you] know dat di [that the] farmer is the backbone of di [the] district? ...well, growing up farmers are important people, is only now dat [that] we can get food what no come from here (imported) that farming is not so important... My father farm and so mi follow in 'im [his] footstep. (*Stalwart* male, age 70+)

The *stalwarts* have a vast amount of practical knowledge and are well-known in the communities. They receive referrals for the sale of their crops from community members. These farmers plant a wide variety of the staple crops, are altruistic, and are comfortable receiving the price at farm-gate. They also expressed a willingness to share copious portions of their products with neighbors. Most of the labor on the farms of *stalwarts* is provided by the farmer, family members, and laborers. This group of smallholder farmers reminisced about a form of labor exchange called “day-for-day” which used to take place as part of a mutually beneficial group effort. However, according to the participants, this tradition has deteriorated and so farmers are forced to use paid laborers for efficient land preparation and re-planting activities. *Stalwarts* in this study indicated that financial support from adult children and from the sale of cows and pigs are some of their sources of additional income.

The final group of farmers in this typology, with the fewest participants, is the *entrepreneurs*. They conveyed that profit making is the reason for their entry into food crop

agriculture. Some of these farmers have formal training in agriculture and deliberately chose farming as their career. A young man testified to this:

Well, basically since I left tertiary institution I have been farming. I did General Agricultural Studies and have a level two in poultry farming and crop science. [Choosing his words carefully, he continued]

...I see it as a profitable business that ummmm...can take you to a higher place with persistence and good management. (*Entrepreneur* male, age 30-39)

A female farmer who uses her agricultural activities to fund her retirement explained that her reason for cultivating crops is to become an established farmer and business-woman who uses her farm products to make value-added products such as jams and jellies to create linkages with the tourism industry.

Entrepreneurs are investors who respond to market forces and policy initiatives, particularly within the agro-processing industry. They value mass production, and their farms are the least diversified. Entrepreneurs generally supply agro-processors and exporters with the bulk of their crops, with smaller amounts sold to vendors for sale at the local markets. Condiments such as hot peppers and scallion, as well as specific varieties of yams, are popular crops grown by these farmers. The *entrepreneurs* do not have the protection from risks that other farmers who plant multiple crops experience. One male *entrepreneur* underscored his awareness of this risk associated with his business, he explained that when the market fails, large quantities of hot peppers can neither be eaten nor used as a substitute feed for livestock, so he loses. These *entrepreneurs* noted that they are also more susceptible to loss by diseases that can destroy their entire crop, if they do not practice good farm management in order to minimize the risks and reap the rewards. Notably *entrepreneurs* provide the most consistent employment, having both full time and part-time workers. Most workers are employed at periods of planting and harvesting. The findings showed that *entrepreneurs* supplement their incomes with a variety of

non-agricultural ventures. For example, bee-keeping is one activity that two of these farmers deemed worthy of their investment.

The wide ranging motivational orientations included self-employment and household food consumption, the need for independence, and a strong commitment to a lifestyle close to nature. For some smallholder farmers traditional food crop production was undertaken because they perceived they had few other opportunities and therefore had no other choice. Still for others, farming is a birthright and it was done out of a sense of duty. These motives are important because they will help to determine how the smallholder farmers respond to obstacles that they will need to vault.

Challenges faced by smallholder farmers

According to the World Bank (2012a) the perspectives of individuals experiencing a job generally reflect the dominant social perspective and constitute a useful starting point for inquiry, hence respondents were asked to discuss and rank the challenges they face in their agricultural activities to provide valuable insights into their daily lives. The participants were very forthcoming about the following limitations to traditional food crop farming in Jamaica.

Cost of fertilizers

Chief among the constraints the participants reported is the high cost of inputs, in particular fertilizers. As one participant lamented:

...farmers sometimes no have di money fe buy di fertilizer... when you plant one acre a corn ... and fertilize it [use fertilizer in it] you cyah mek it back [you cannot recover the cost of producing (the corn)] (*Go-getter* male, age 30-39)

The majority of the informants ranked their inability to afford fertilizer as a major challenge to their level of productivity. They believe they need to use fertilizers to boost their yield but find the cost of doing so prohibitive.

Lack of irrigation

The lack of irrigation was also regarded as a major constraint. The *entrepreneurs* in this study were the farmers with the most irrigated farms, while the *go-getters* expressed frustration over the limitations of geographical location and the absence of irrigation infrastructure. Some *sustainers* and *stalwarts* tended to speak about irrigation in terms of rainfall patterns and changing weather conditions likely because their production is mainly rain-fed and they do not consider mechanical irrigation a possibility.

Availability of labor

Labor featured prominently as a constraint in the agricultural activities of the participants. The problems associated with labor ranged from its unavailability in some areas, and its high cost, to the poor quality work done by laborers. Good workers are in short supply according to the participants in this study. These smallholder farmers elaborated:

Listen, the job is here, *but* it's the worker that is the problem. The job is here because right now I can employ all four more man yuh nuh [up to four more men, you know]...*but* dem [their] attitude poor. If mi did have [if I had] some people who woulda work, mi could do more [I could produce more (crops)]. (*Entrepreneur*, male, age 50-59)

A female participant stated,

Sometime as a ooman [woman] farmer you cyah get no [cannot get any] help wid it [with (farming)] so yu affi batta batta [you have to struggle] and tek time dweet yu self... [do it by yourself little by little] (*Sustainer*, female, age 60-69)

Some *stalwarts* contended that the labor shortage being experienced by farmers is a reflection of the attitudes in the wider society, because people are not interested in agriculture. The *stalwarts*

recounted experiences from the past and complained about the loss of a traditional labor practice involving labor exchanges. These farmers, more than others in this typology, thought that their labor problems stemmed from the erosion of “day-for-day” - a practice by which a group of farmers would spend a day working on the farm of each group member until everyone in the group has their labor needs addressed. This reflects local changes in agriculture labor practices:

It’s not like first time [in the past] ...everybody provide their own labor – it’s not like when I was growing up and they had what we call ‘working’ dat system break down...[pausing reflectively before continuing slowly]...it break down a lot (*Stalwart* male, age 70+)

The issue of labor on the smallholder farm is further complicated by the suspicions and lack of trust farmers have of potential workers. One participant matching the profile of an *entrepreneur* explained:

In this area, labor can be had fairly easily but you have to be careful who you choose because of praedial larceny. Some of them will work with you and after you pay them and they know you are gone home for the day they come back to reap for themselves and enjoy themselves (*Entrepreneur* female, age 60-69).

Praedial larceny

Praedial larceny or petty thievery is another challenge the smallholder farmers in western Jamaica face. The participants in this study had a range of perceptions about this criminal activity. For instance, one *sustainer* mentioned sympathetically that the petty thieves would “...only take one or two things, but not too much.” But *go-getters* and female farmers were more incensed by the actions of larcenists. The losses farmers experienced were not restricted to crops but included expensive farm equipment:

Mi suffa bad, dem teef everything! [I suffer greatly, they steal everything! Mi [my] equipment and pipe fixtures on di farm. Di other day dem teef mi [they stole my] mist blower wha [which] cost mi [J\$] 70 000 (USD700) so now mi affi go [I have to] buy

another one and dem teef [they have stolen] one pump from mi down here too. We need some stiffer laws. (*Go-getter* female, age 40-49).

The farmers expressed frustration with the inability of the authorities to curb this illicit behavior but as one *stalwart* summarily stated the resolve of many when she commented that:

“You can’t make thief stop you. If you make them deter you there will be no food in this country.” (*Stalwart* female, age 50-59).

Weather changes

Weather-related problems were cited as another major challenge for the informants in this study. The data for this research was collected within two to three months after Hurricane Sandy hit Jamaica in October 2012. The participants communicated the difficulties they were experiencing with droughts, bouts of heavy rainfall and frequent hurricanes. They felt ill-equipped and ill-prepared to cope with the effects of these extreme weather conditions. An *entrepreneur* explained the impact of inclement weather on agriculture production in the study area:

Yeah, the weather is a major challenge. Weather cause us to lose a lot of crop. Too much rain, right now rain is a major challenge, because whenever we getting the rain we getting it too much; ...the drought a one [is another] major challenge again [as well]. You know we used to get the rain on a moderate rate but now mi no know [I don’t know] anytime a [it’s] dry time a [it’s] just *DRY* ...and when time [whenever] you see the rain you just get too much rain. Because di [the] crop cyah tek [cannot take] too much rain it cyah tek [cannot take] too much drought, you know it need a balance... It cause di [the] farmer fe [to] lose a lot of crop. Mi no know wha’ fe do [I don’t know what to do] (*Entrepreneur* male, age 60-69)

The obstacles the smallholder farmers face were not restricted to those identified above.

Other notable challenges included the absence of an affordable credit or insurance scheme for smallholder farmers who often need support following the loss of their crops to natural disasters, pests, and, or diseases. The participants complained that they do not have the collateral required to qualify for existing programs. Another problem, which has direct implication for food security, relates to complaints about the lack of adequate infrastructure and proper sanitary

conditions at the local marketplaces. Farmers who go to the market to sell their produce indicated that consumers were reluctant to visit the markets because of the general lack of order and poor facilities. These conditions have negative implications on the physical access to food and therefore impact food security outcomes in the area.

Smallholder farmers' successes

The Jamaican smallholder farmer takes pride in the contribution they make to their families' nutrition and the local community. *Stalwarts* pointed to their continuation of local agricultural tradition as a motivation for their job and a badge of honor for which they were particularly proud. *Entrepreneurs* emphasized the fact that they provided employment as a major success and something they were pleased with. The majority of the *sustainers* identified their abilities to share food with family and friends as a sign of their success. Men prided themselves on the superior qualities of their crops when compared with their neighbors in the same community. Women were more modest in this respect, opting to reservedly convey that they sometimes, but do not always, produce greater yields and better quality food crops than others.

Discussion

The evidence suggests that the motives and attitudes of the traditional food crop farmers' are reflected in the three pillars of the TPB behavioral choice model. For instance, the first pillar of TPB identifies whether the individual's attitude toward a specific behavior is positive or negative. The typology captured the different sub-groups attitude toward farming and showed *stalwarts*, *go-getters* and *entrepreneurs* have positive attitudes and outlook.

The second pillar of the framework examines individual's perceived behavioral control, which takes into account the extent to which the individual perceives he/she has control over performing a behavior. Here, the attitudes of smallholder farmers classified as *sustainers*, who expressed that they did not choose to be farmers but rather had no choice but to farm, reflect very limited behavioral control. In contrast to the *sustainers'* perceived low behavioral control, *entrepreneurs*, *go-getters* and *stalwarts* motives indicate deliberate occupational choice and many valued reasons for their behavior.

The third pillar discusses subjective norms, that is, the attitude of significant others or the social pressure placed on the individual to perform a behavior. *Stalwarts* stated that they felt an obligation to be farmers because there were expectations for them to maintain the farming tradition in the family or in the community. However, all categories of smallholder farmers reported a sense of satisfaction with their job and indicated that they felt valued as providers of food for their families and their communities.

TPB was instructive in helping to conceptualize the component parts of smallholder farmers' decision making and brought into sharp focus other considerations for policymakers seeking to target that population. Smallholder farmers' attitudes toward their job, perceived behavioral control and subjective norms are discreet factors that contribute to their behavior. These factors help to create the motivational orientations of smallholder farmers and influence actions that hold implications for food security policies. The World Bank (2012a) deemed this kind of local knowledge significant to policymaking, especially in the agricultural sector where the behavior of farmers affects not only the well-being of the farmers but also the well-being of others in society.

The evidence revealed that in western Jamaica smallholder farmers' livelihood choices were also the results of complex interactions among different social, economic and cultural factors. The motivation for food crop farming was fueled by household consumption needs, income generation needs, and cultural preferences. Although, the farmers faced numerous physical, technical and environmental challenges in their efforts to produce, they reported individual successes and spent on average 26.2 years growing traditional food crops. The World Bank (2012a) concluded that although "...farming jobs involve difficult working conditions, substantial variability in earnings, and no formal social protection, [farming] can make a major contribution to development or as a ticket out of poverty for many" (p.17). Additionally, farming jobs are significant for achieving food security goals.

Conclusion

The classification of different motivational orientations for farmers is crucial knowledge for policymakers who can use this evidence to provide targeted interventions to address food availability in western Jamaica. Policies addressing the complex issue of food insecurity need to be well informed and sensitive to the differences among smallholder farmers. This context-specific evidence can be used as an entry point for improved agricultural policy formulation and implementation. The need to identify individuals with the impelling drive to overcome adversities and become successful farmers is paramount to achieving food security in Jamaica. Therefore, incorporating a reasonable understanding of smallholder farmers' motives in a bottom-up approach to agricultural policies is critical.

Policymakers in Jamaica can ill-afford to wait for another food crisis to have policies in place, hence it is important to understand the heterogeneity among the smallholder farmer

population in order to design effective programs and policies to suit different circumstances. This evidence may be used to identify a core group of producers for sustainable agricultural production or to help to define more precisely sub-groups that are more vulnerable. However, the formulation of these targeted policies requires further research to identify other significant behaviors farmers need to retain. This typology can be deepened to explore, among other issues, the attitudes of smallholder farmers toward the adoption and use of information and communication technologies for agricultural purposes.

Consideration of the trade-offs between inefficient, homogeneous top-down agricultural policies and more innovative context-specific interventions, formulated from the bottom-up, remains one of the critical decisions policymakers will have to make in determining which direction to take. Targeting subsistence-oriented small farms, through careful assessment, may prove to be more cost-effective than other income transfers or social safety nets (Hazell et al., 2010; van de Walle, 1998; Wiggins et al., 2010; See also World Bank 2012b). The differential experiences and motivational heterogeneity among farmers in Jamaica will provide agricultural policymakers with information that will deepen the discussions on access to food and food availability in the study area. Further, the context-specific evidence will also serve to refine policy interventions in the agricultural sector and advocate for more bottom-up approaches. This classification of smallholder farmers is one more tool decision makers have in their arsenal to use for the efficient and targeted allocation of resources to achieve food security goals.

REFERENCES

- Aitchison, J.W., & Aubrey, P. (1982). Part-time farmers in Wales: A typological study. *Transaction of the institute of British geographers* 7(1), 88-97.

- Ajzen, I. & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-hall Inc.
- Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior: Attitudes, intentions and perceived behavioral control. *Journal of experimental social psychology* 22(5), 453-474.
- Alsos, A., Ljunggren, E., & Pettersen, L. (2003). Farm-based entrepreneurs: What triggers the start-up of new business activities? *Journal of small business and enterprise development* 10(4), 435-443.
- Brown, D. (2014). Map of Jamaica: Study Area. *ArcGIS® ArcMap™10.2*. University of Arkansas <http://www.arcgis.com/home/webmap/viewer.html>
- Barnes, A. & Toma, L. (2012). A typology of dairy farmer perceptions towards climate change. *Climatic Change* 112(2), 507-522.
- Beckford, C. & Barker, D. (2007). The role and value of local knowledge in Jamaican agriculture: Adaptation and change in small-scale farming. *The Geographical Journal* 173(2), 118-128.
- Beckford, C., Barker, D., and Bailey, S. (2007). Adaptation, innovation and domestic food production in Jamaica: Some examples of survival strategies of small-scale farmers. *Singapore Journal of Tropical Geography* 28, 273 -286.
- Beckford, C. (2012). *Issues in Caribbean Food Security: Building Capacity in Local Food Production Systems, Food Production - Approaches, Challenges and Tasks*, Prof. Anna Aladjadjian (Ed.), Retrieved from: <http://www.intechopen.com/books/food-production-approacheschallenges-and-tasks/issues-in-caribbean-food-security-building-capacity-in-local-food-production-systems>.
- Bondoo, R. (2012). Producing root crops in a sustainable manner. In, W.G. Ganpat & W.P. Isaac (eds.) *Sustainable food production practices in the Caribbean*, (pp. 129-138). Kingston, Jamaica: Ian Randle Publishers.
- Burton, Rob, J.F. (2004). Reconceptualising the 'behavioural approach' in agricultural studies: a socio-psychological perspective. *Journal of rural studies* 20, 359-371.
- Crow, Graham & Edwards, Rosalind. (2013). *What is qualitative interviewing?* London, Great Britain: Bloomsbury publishing.
- Edward-Jones, G. (2006). Modelling farmer decision-making: concepts, progress and challenges. *Animal science* 82(6), 783-790. Retrieved from http://journals.cambridge.org/abstract_S1357729806000944
- Fan, S., Brzeska, J., Keyzer, M. & Halsema, A. (2013). From subsistence to profit: Transforming smallholder farms. International Food Policy Research Institute (IFPRI). Retrieved from <http://www.ifpri.org/sites/default/files/publications/pr26.pdf>.

- Fielding, K.S., Terry, D.J., Masser, B.M., & Hogg, M.A. (2008). Integrating social identity theory and the theory of planned behavior to explain decisions to engage in sustainable agricultural practices. *British journal of social psychology* 47, 23-48.
- Food and Agriculture Organization (FAO). (2013). *The state of food and agriculture 2013: Food systems for better nutrition*. Rome, Italy: Food and Agriculture Organization of the United Nations. Retrieved from <http://www.fao.org/docrep/018/i3300e/i3300e.pdf>
- Grant, W. (2006). Agriculture and food. In Peter Guy and Jon Pierre (Eds.). *Handbook of Public Policy* (pp. 309-321). Thousand Oaks, California: SAGE Publications Inc.
- Hansson, H., Ferguson, R., & Olofsson, C. (2012). Psychological constructs underlying farmers' decisions to diversify or specialize their business – an application of theory of planned behavior. *Journal of agricultural economics* 63(2), 465-482.
- Hazell, P., Poulton, C., Wiggins, S. & Dorward, A. (2010). The future of small farms: Trajectories and policy priorities. *World development* 38(10), 1349-1361.
- Hayati, D., & Karami, E. (2005). Typology of causes of poverty: The perception of Iranian farmers. *Journal of Economic psychology* 26(6), 884-901.
- Hills, T.L. (1988). The Caribbean peasant food forest, ecological, artistry and random chaos. In, J.S. Brierley and H. Rubenstein (Eds.) *Small farming and peasant resources in the Caribbean*, pp. 1-28. Winnipeg, Canada: University of Manitoba Press.
- Horton, D. (1998). Disciplinary Roots and Branches of Evaluation: Some Lessons from Agricultural Research. *Knowledge and Policy: The International Journal of Knowledge Transfer and Utilization* 10(4), 3-66.
- Houston, L.M. (2005). *Food culture in the Caribbean*. Westwood, CT U.S.A.: Greenwood press.
- Innerarity, F. (1996). *Program for the Analysis of agricultural policies vis-à-vis women food producers in the Andean, the Southern Cone and the Caribbean: Women Producers in in Jamaica: Assessment and policies*. Inter-American institute for the Cooperation on Agriculture (IICA). Retrieved from http://0-books.google.com.library.uark.edu/books?id=UOAqAAAAYAAJ&dq=women+food+producers+in+Jamaica&lr=&source=gbs_navlinks_s
- International Fund for Agricultural Development (IFAD). (2013). *Smallholders, food security and the environment*. Retrieved from http://www.ifad.org/climate/resources/smallholders_report.pdf
- Kauppinen, T., Vainio, A., Valros, A., Rita, H., & Vesala, K. (2010). Improving animal welfare: qualitative and quantitative methodology in the study of farmers' attitude. *Animal welfare* 19, 523-536.

- López, R. (2007). Agricultural growth and poverty reduction. In, F. Bresciani, & A. Valdés (Eds.), *Beyond food production: The role of agriculture in poverty reduction* (pp. 41-54). Cheltenham, UK: Edward Elgar.
- Mathieson, K. (1991). Predicting user intentions: Comparing the technology acceptance model with the theory of planned behavior. *Information systems research* 2(3), 173-191.
- Meikle-Yaw, P. (2005). Globalization of agriculture: Effects on social and natural systems in rural communities of Jamaica. *Caribbean geography* 14(1), 40-54.
- Morgan, D. (2008). Snowball sampling. In L. Given (Ed.), *The SAGE encyclopedia of qualitative research methods*. (pp. 816-817). Thousand Oaks, CA: SAGE Publications, Inc. doi: 10.4135/9781412963909.n425
- Murphy, S. (2010). Changing perspectives: Small-scale farmers, markets and globalization. Retrieved from <http://ictsd.org/downloads/2012/08/changing-perspectives-small-scale-farmers-markets-and-globalisation-murphy-iiied.pdf>.
- Pennings, J.E. & Leuthold, R.M. (2000). The role of farmers' behavioral attitudes and heterogeneity in futures contract usage. *Journal of agricultural economics* 82(4), 908-919.
- Pinstrup-Andersen, P. & Watson II, D.D. (2011). *Food policy for developing countries: The role of government in global, national and local food systems*. New York, NY: Cornell University Press.
- Pike, T. (2008). Understanding behaviors in a farming context: Bringing theoretical and applied evidence together from across Defra and highlighting policy relevance and implications for future research. Retrieved from <http://archive.defra.gov.uk/evidence/statistics/foodfarm/enviro/observatory/research/documents/ACEO%20Behaviours%20Discussion%20Paper%20%28new%20links%29.pdf>
- Planning Institute of Jamaica (PIOJ). (2012). *Economic and Social Survey of Jamaica: 2011*. Kingston, Jamaica: Planning Institute of Jamaica.
- Nvivo Qualitative data analysis software. QSR International Limited. (2012). Nvivo Version 10. www.qsrinternational.com
- Ramakrishnan, P.S. (2001). Ethnobiology. In, N. J. Smelster & P. B. Baltes (Eds.), *International Encyclopedia of the Social & Behavioral Sciences*, (pp. 4286-4852). Oxford, UK: Elsevier Science.
- Ravallion, M. (2003). Targeted transfers in poor countries: Revisiting the trade-offs of policy options. World Bank CPRC working paper No. 26. Retrieved from http://www.chronicpoverty.org/uploads/publication_files/WP26_Ravallion.pdf
- Robson, C. (2011). *Real world Research: a resource for users of social research methods in applied settings*. West Sussex, UK: John Wiley & Sons Ltd.

- Sabatier, P. (1986). Town-down and bottom-up approaches to implementation research: A critical analysis and suggested synthesis. *Journal of public policy* 6(1), 21-48.
- Sefa-Dedah, S. (2003). Traditional Food Technology. In, B. Caballero, L.C. Turgó & P.M. Finglas. (Eds.), *Encyclopedia of food sciences and nutrition* (pp. 5828-5834). Oxford, UK: Academic Press.
- Spence, A. B. (1999). Spatio-evolutionary model of Jamaica small farming. *The Geographical Journal* 165(3), 296-305.
- Statistical Institute of Jamaica (STATIN) (2008). *Agriculture census: Jamaica 2007*. Kingston, Jamaica: Planning Institute of Jamaica.
- Tracy, S. J. (2013). *Qualitative research methods: collecting evidence, crafting analysis, communicating impact*. Somerset, NJ: Blackwell Publishing Ltd.
- Tripp, R. (2006). *Self-Sufficient Agriculture: Labour and Knowledge in small-scale farming*. London, UK: Earthscan.
- Van de Walle, D. (1998). Targeting revisited. *The World Bank research observer* 13(2), 231-248.
- Vik, J., & McElwee, G. (2011). Diversification and the entrepreneurial motivations of farmers in Norway. *Journal of small business management* 49(3), 390-410.
- Wiggins, S., Kirsten, J., & Llambí, L. (2010). The future of small farms. *World Development* 38(10), 1341-1348.
- Weis, T. (2001) "Contradictions and change in Jamaica: Theorizing eco-social resistance amidst ecological crisis" *Capitalism, Nature, Socialism* 12(2), 85-131.
- Weis, T. (2004). (Re-)Making the case for land reform in Jamaica. *Social and Economic Studies*, 53(1), 35-71.
- Weis, T. (2006). The rise, fall and future of the Jamaican peasantry" *Journal of Peasant Studies* 33(1), 61-88.
- World Bank. (2007). *World development report 2008: Agriculture for development*. Washington DC: The International Bank for Reconstruction and Development / The World Bank.
- World Bank. (2012a). *World development report 2013: Jobs*. Washington DC: The International Bank for Reconstruction and Development / The World Bank.
- World Bank. (2012b). *Global monitoring report 2012: Food process, nutrition, and the millennium development goals*. Washington DC: The International Bank for Reconstruction and Development / The World Bank.

APPENDICIES

December 13, 2012

MEMORANDUM

TO: Deborah Brown
Jennie Popp

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 12-11-272

Protocol Title: *Food Security in Jamaica*

Review Type: ☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB

Approved Project Period: Start Date: 12/13/2012 Expiration Date: 12/12/2013

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 50 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

Interview Protocol for Jamaican Farmers

Interviewee Number: _____

Q1. How many years have you been a farmer? _____ years.

Q2. Why did you decide to become a farmer? _____
_____.

Q3. Do you have the following traditional crops on your farm?

Q4. If Yes in Q3, state how much of each produce is sold, used in the home, stolen or other uses?

1= None of it

2= Some of it

3= Most of it

Traditional Crops	Yes	No				
			Used in home	Sold on the market	Lost to thieves	Other
<u>Tree Crops</u>						
Ackee						
Plantains						
Bananas						
Breadfruit						
<u>Root and Tubers</u>						
Cassava						
Dasheen						
Sweet potato						
Yams						
<u>Vegetables</u>						
Calaloo						
Sorrel						
Peas						

Other						

Q5. How has the composition of your crops changed in the last three (3) years? **In the last 3 years...**

“I have planted more _____ but less _____ because _____.”

OR

“It has not changed because _____.”

Q6. Please tell me the name a traditional food which does **not grow well** in your district and why?

Q7. I am going to ask you to think about the last three years (2010-2012), Please tell me approximately, what percentage of your household income has come from your farming activities?

Years	2010	2011	2012
<i>Estimated percentage of household income from farming</i>			

Q8. Let's talk about work on your farm. I going to list some farming activities please tell me, who does the following activities on your farm and Why?

[Reasons: financial reasons, informal sharing agreements, family responsibility, availability at needed time, other]

Farming Activity	Who	WHY?
-------------------------	------------	-------------

Land preparation		
Planting		
Weeding		
Harvesting		
Marketing		

Q9. I am going to list some possible challenges farmers in Jamaica might face, please rank the following challenges according to your experience in your crop production?

1 = no challenge

2 = minor challenge

3 = major challenge

Potential Challenge	Rank Challenge	Potential Challenge	Rank Challenge
Availability of seeds or suckers		Availability of labor	
Availability of fertilizer		Spoilage – in field	
Affordable fertilizer		Praedial larceny	
Availability of pesticide		Access to good roads to the market	
Affordable pesticide		No market for my crop (oversupply)	
Available machinery		Marketplace conditions (physical/infrastructure)	
Technical advice		Time to spend on the farm	
Weather-related problems		Other	

Q10. Are there other challenges you face that are not mentioned above? YES ☐ NO ☐

Q11. Now, I am going to list possible successes farmers in Jamaica might experience; Please rank the following successes according to your experience in your crop production?

1 = no success

2 = minor success

3 = major success

Potential Success	Rank	Potential Success	Rank
-------------------	------	-------------------	------

Good yields for my crops		Having food to share with friends	
Planning crop production to receive high prices at the market		Producing better (quality) crops than my neighbors	
Always having food to contribute to family's meals		Continuing the tradition of agriculture in the district	
Providing job opportunities in my district		Practicing soil conservation on my farm	
Use of new farming method/s		Being recognized by others for my knowledge of good farming practices	

Q12. Are there other things you have achieved that are not mentioned here? YES ☐ NO ☐

_____.

Q13. Please give your opinion of women farmers in your area.

- a. List **two** ways in which you think women farmers are the similar to you.
- b. List **two** ways in which you think women farmers are the different from male farmers.

[Possible prompts for differences and similarities: Size of plot, crop yields, level of effort in agricultural production, prices received for crops, how harvested crops are used (sold, home use, etc), distance of plot from home, younger/older, access to resources, reasons for farming, any other reasons?]

About Women Farmers	
Similarities	Differences
I.	I.

II.	III.
-----	------

Q15. This next question is about groups. Are you a member of any of the following agricultural group(s) in your area?

Types of Group	YES	NO
Producer Marketing Organization (PMO)		
Jamaica Agricultural Society (JAS)		
Peoples' Co-operative Credit Union		
Other		

Q16. Do farmers in your district co-operate with each other/ share resources in the following ways? If Yes, Please give an example

Farming activities	YES	NO	If YES, Examples of co-operation
Labor			
Marketing			
Equipment			
Information sharing			
Other (Saving clubs)			

Q17. *Information and Communication Technologies (ICTs) tools include Radio, Television, Internet, Mobile phone.* Have you ever use any of the following ICTs for agricultural information?

If Yes, please give one example

Information and Communication Technologies (ICTs)	YES	NO	If YES, Give one example
Radio			
Television			
Internet			
Mobile phone (Talk)			
Mobile phone (Text/SMS)			
Social Media			

Q18. How would you rank the challenges you experience in getting agricultural information using the following ICTs? Please justify your ranking.

1 = No Challenge

2 = Minor Challenge

3 = Major Challenge

Information and Communication Technologies (ICTs)	Rank Challenges	Justification of Ranking
Radio		
Television		
Internet		
Mobile phone (Talk)		
Mobile phone (Text)		
Social Media		

Q19. Kindly provide me with the following demographic information.

Factors	
Gender	_____ Male _____ Female
Marital Status	_____ Single _____ Common Law Relationship _____ Married

	_____ Divorced _____ Widowed
How many people live in your household?	_____ Children 0 to 17 years _____ Adults 18 or older
Level of Education	_____ Primary _____ Secondary _____ Technical/Vocational Training _____ Tertiary
Other sources of household income	_____ Livestock _____ Part-time job _____ Full time job _____ Seasonal job _____ Partner's job _____ Remittances _____ Other
What age range represents you?	_____ 18-29 _____ 30-39 _____ 40-49 _____ 50-59 _____ 60-69 _____ 70+

Q20. What advice do you have for someone interested in going into farming in Jamaica today?

Screenshot of interviews with participants in NVIVO Qualitative data analysis software

The screenshot displays the 'Interviews' list in NVIVO. The left sidebar shows the 'Sources' tree with 'Interviews' selected. The main window shows a table of interviews with columns for Name, Nodes, References, Created On, Created By, Modified On, and Modified By. The table lists 24 interviews, each with a unique name and associated metadata.

Name	Nodes	References	Created On	Created By	Modified On	Modified By
Interview #1	62	62	6/10/2013 3:13 PM	DEB	6/14/2013 6:55 PM	DEB
Interview #10	60	60	6/10/2013 3:13 PM	DEB	6/14/2013 6:56 PM	DEB
Interview #11	52	55	6/10/2013 3:13 PM	DEB	6/14/2013 7:04 PM	DEB
Interview #12	53	61	6/10/2013 3:13 PM	DEB	6/14/2013 6:58 PM	DEB
Interview #14	61	60	6/10/2013 3:13 PM	DEB	6/14/2013 7:06 PM	DEB
Interview #15	55	67	6/10/2013 3:13 PM	DEB	6/15/2013 9:02 AM	DEB
Interview #16	49	60	6/10/2013 3:13 PM	DEB	7/7/2013 1:32 PM	DEB
Interview #16	49	60	6/10/2013 3:13 PM	DEB	7/7/2013 1:32 PM	DEB
Interview #17	49	61	6/10/2013 3:13 PM	DEB	6/15/2013 7:10 AM	DEB
Interview #18	63	66	6/10/2013 3:13 PM	DEB	6/15/2013 2:14 PM	DEB
Interview #19	67	61	6/10/2013 3:13 PM	DEB	6/21/2013 7:42 PM	DEB
Interview #2	58	62	6/10/2013 3:13 PM	DEB	6/21/2013 7:48 PM	DEB
Interview #20	73	77	6/10/2013 3:13 PM	DEB	6/16/2013 6:16 PM	DEB
Interview #21	61	63	6/10/2013 3:13 PM	DEB	7/7/2013 1:38 PM	DEB
Interview #22	58	64	6/10/2013 3:13 PM	DEB	6/16/2013 10:07 PM	DEB
Interview #25	69	75	6/10/2013 3:13 PM	DEB	6/17/2013 10:36 PM	DEB
Interview #24	67	64	6/10/2013 3:13 PM	DEB	6/18/2013 9:34 AM	DEB
Interview #25	67	73	6/10/2013 3:13 PM	DEB	6/18/2013 10:38 AM	DEB
Interview #26	66	73	6/10/2013 3:13 PM	DEB	6/25/2013 7:43 PM	DEB
Interview #27	77	65	6/10/2013 3:13 PM	DEB	6/21/2013 8:30 AM	DEB
Interview #28	67	66	6/10/2013 3:13 PM	DEB	7/8/2013 3:01 PM	DEB
Interview #28	62	64	6/10/2013 3:13 PM	DEB	6/19/2013 10:39 AM	DEB
Interview #3	69	74	6/10/2013 3:13 PM	DEB	6/21/2013 9:22 AM	DEB
Interview #30	67	70	6/10/2013 3:13 PM	DEB	6/21/2013 10:13 AM	DEB
Interview #31	72	76	6/10/2013 3:13 PM	DEB	6/21/2013 6:38 PM	DEB
Interview #32	71	77	6/10/2013 3:13 PM	DEB	6/21/2013 6:38 PM	DEB
Interview #33	64	75	6/10/2013 3:13 PM	DEB	6/21/2013 7:41 PM	DEB
Interview #34	69	62	6/10/2013 3:13 PM	DEB	6/21/2013 6:52 PM	DEB
Interview #35	58	60	6/10/2013 3:13 PM	DEB	6/21/2013 5:55 PM	DEB

Screenshot showing coding in NVIVO Qualitative data analysis software

The screenshot displays the 'Nodes' list in NVIVO. The left sidebar shows the 'Nodes' tree with 'Nodes' selected. The main window shows a table of nodes with columns for Name, Sources, References, Created On, Created By, Modified On, and Modified By. The table lists 27 nodes, each with a unique name and associated metadata.

Name	Sources	References	Created On	Created By	Modified On	Modified By
1) About women farmers	38	38	6/10/2013 5:55 PM	DEB	6/23/2013 9:22 PM	DEB
2) Advice to future farmers	42	42	6/10/2013 10:17 PM	DEB	6/23/2013 9:35 PM	DEB
3) Crops grown	42	42	6/10/2013 8:41 PM	DEB	6/23/2013 6:17 PM	DEB
4) Farmer to farmer share info	38	38	6/11/2013 10:11 PM	DEB	6/23/2013 6:27 PM	DEB
5) Female	36	36	6/10/2013 10:11 PM	DEB	6/24/2013 3:52 PM	DEB
6) Group Membership	36	36	6/12/2013 10:23 AM	DEB	6/23/2013 5:44 PM	DEB
7) Internet for Ag info	42	42	6/10/2013 9:53 PM	DEB	6/23/2013 6:30 PM	DEB
8) Labor in farm area	34	35	6/10/2013 9:58 PM	DEB	6/23/2013 6:16 PM	DEB
9) Major success	11	11	6/12/2013 9:55 PM	DEB	7/15/2013 9:25 PM	DEB
10) Rate	16	16	6/12/2013 10:07 PM	DEB	7/15/2013 9:25 PM	DEB
11) Market cooperation	18	18	6/10/2013 9:17 PM	DEB	6/23/2013 6:26 PM	DEB
12) Mobile phone challenges	37	37	6/10/2013 10:03 PM	DEB	6/23/2013 6:30 PM	DEB
13) Motivation	42	42	6/10/2013 9:16 PM	DEB	6/23/2013 6:06 PM	DEB
14) Possible problems	31	31	6/11/2013 9:25 PM	DEB	6/23/2013 6:21 PM	DEB
15) Radio for Ag info	40	40	6/10/2013 8:47 PM	DEB	6/23/2013 6:31 PM	DEB
16) Reason for types of crops	40	40	6/10/2013 8:47 PM	DEB	6/23/2013 6:30 PM	DEB
17) Share farm implements	22	23	6/11/2013 10:08 PM	DEB	6/23/2013 6:27 PM	DEB
18) SMS for Ag info	39	43	6/10/2013 10:06 PM	DEB	6/23/2013 6:33 PM	DEB
19) Social Media	42	42	6/10/2013 10:06 PM	DEB	6/23/2013 6:35 PM	DEB
20) TV for Ag info	35	40	6/10/2013 9:45 PM	DEB	6/23/2013 6:31 PM	DEB
21) Use of mobile phone talk	42	42	6/10/2013 9:28 PM	DEB	7/8/2013 3:01 PM	DEB

Screenshot showing coding of data at child nodes in NVIVO Qualitative data analysis software

The screenshot displays the NVIVO software interface with a list of nodes on the left and a detailed table of node data on the right. The table includes columns for Name, Sources, References, Created On, Created By, Modified On, and Modified By. The nodes are organized into a hierarchical structure, with 'Labor in farm area' being the primary node, which branches into several sub-nodes like 'Common complaints re labor', 'breakdown in traditional labor practice', 'expectations of laborer', 'need to get help', 'no money to help', 'poor quality of work', 'no cooperation', 'Options available to farmers', and 'see farmers help with labor'. Other nodes include 'Major success', 'Male', 'Market cooperation', 'Mobile phone challenges', 'minor challenge - cell', 'minor challenge - cell', 'no challenge', 'attributed to phone use', 'Motivation', 'Independence', and 'Intentional farmers'.

Name	Sources	References	Created On	Created By	Modified On	Modified By
Labor in farm area	24	25	6/10/2013 3:08 PM	DEB	6/22/2013 5:14 PM	DEB
Common complaints re labor	10	20	7/6/2013 10:10 PM	DEB	7/6/2013 10:10 PM	DEB
breakdown in traditional labor practice	2	2	6/15/2013 9:52 PM	DEB	6/21/2013 9:46 AM	DEB
expectations of laborer	5	5	6/19/2013 9:13 PM	DEB	6/22/2013 5:38 PM	DEB
need to get help	6	6	6/19/2013 9:10 PM	DEB	6/23/2013 5:14 PM	DEB
no money to help	4	4	6/19/2013 9:11 PM	DEB	6/21/2013 9:05 AM	DEB
poor quality of work	3	3	6/17/2013 10:04 PM	DEB	6/23/2013 5:14 PM	DEB
no cooperation	4	4	6/10/2013 9:09 PM	DEB	6/21/2013 9:46 AM	DEB
Options available to farmers	4	5	7/6/2013 10:17 PM	DEB	7/6/2013 10:18 PM	DEB
see farmers help with labor	15	15	6/11/2013 5:52 PM	DEB	6/22/2013 7:59 PM	DEB
Major success	11	11	6/12/2013 9:05 PM	DEB	7/15/2013 5:25 PM	DEB
Male	16	16	6/12/2013 10:07 PM	DEB	7/15/2013 5:25 PM	DEB
30-39	2	2	6/19/2013 10:31 AM	DEB	6/19/2013 9:05 PM	DEB
40-49	5	5	6/14/2013 6:57 PM	DEB	6/23/2013 5:24 PM	DEB
50-59	5	5	6/16/2013 6:05 PM	DEB	6/22/2013 8:25 PM	DEB
60+	2	2	6/21/2013 7:22 PM	DEB	6/22/2013 5:19 AM	DEB
Male whole interview code	16	16	7/6/2013 12:15 PM	DEB	7/6/2013 12:16 PM	DEB
Market cooperation	18	18	6/13/2013 9:17 PM	DEB	6/23/2013 6:25 PM	DEB
Mobile phone challenges	37	37	6/19/2013 10:03 PM	DEB	6/20/2013 6:32 PM	DEB
minor challenge - cell	3	3	6/15/2013 2:02 PM	DEB	6/23/2013 5:20 PM	DEB
minor challenge - cell	6	6	6/14/2013 11:10 PM	DEB	6/22/2013 6:17 PM	DEB
no challenge	20	20	6/10/2013 10:04 PM	DEB	6/23/2013 6:32 PM	DEB
attributed to phone use	4	4	6/16/2013 8:37 PM	DEB	6/23/2013 5:20 PM	DEB
Motivation	42	42	6/18/2013 2:15 PM	DEB	6/23/2013 6:06 PM	DEB
Independence	28	28	7/1/2013 12:28 AM	DEB	7/15/2013 5:25 PM	DEB
Intentional farmers	10	13	7/1/2013 12:27 AM	DEB	7/15/2013 5:25 PM	DEB

CHAPTER 3. SOCIAL CAPITAL, ICT AND INFORMATION FLOW AMONG SMALL FARMERS IN JAMAICA: IMPLICATIONS FOR FOOD SECURITY POLICYMAKING

Abstract

Knowledge transfer and information sharing are important considerations for the agricultural sector. The advent of new information and communication technologies (ICTs) can make it easier for greater and more efficient access to information. The smallholder farmer needs information to improve productivity, reduce risk, receive training, adopt innovations, create networks, mobilize for participation and facilitate other decision-making processes. This paper evaluated ICT use among smallholder farmers in western Jamaica ($N=42$). Based on a typology that established farmers' motivational orientation for farming, the study employed qualitative interviewing to collect data pertaining to smallholder farmers' network and ICT capacities. The level of community social capital was deemed relevant to this investigation, therefore participation in group activities and farmer-to-farmer relationships were also taken into account.

The findings revealed that traditional forms of information sharing continued to be popular among the participants but mobile phone use has become more pervasive, even though the intensity of use varied among farmer groupings. Internet-based applications however, received very low utility across all groups of farmers, due to the absence of technological infrastructure, and farmers' lack of skills. Although smallholder farmers' networks were supported by high levels of bonding social capital, the results showed that they experienced a paucity of bridging and linking social capital. It was evident that the symbiotic relationship shared by social capital and ICTs, which can significantly improve informational flow, strengthen agricultural networks and improve food security in rural Jamaica, has remained underexploited.

Keywords: ICTs; social capital; smallholder farmers; food security

Introduction

As agriculture becomes more knowledge intensive, access to appropriate information and knowledge are critical to increasing productivity and fostering sustainable agricultural growth in developing countries. Since the 1990s, sources of information and the forms of information delivery have undergone rapid evolution and are widely diversified. Understanding farmers' information needs, their information-seeking behavior and the factors that enhance or constraint their access to and use of agricultural information are essential considerations for policymakers designing appropriate food security policies (Badu, Glendenning, Assenso-Okoyere & Govindarajan, 2012; Herbel, Crowley, Ourabah-Haddad & Lee, 2012). A good entry point for understanding farmers' behavior with regards to agricultural information is to examine their networks and ways of communicating. For this reason, an awareness of social capital is instrumental since a key component of social capital is relationships. The nature of information flow and an examination of group participation can importantly link social capital to the uptake of ICT for agricultural purposes (Badu, et al., 2012; Tripp, 2006).

This paper examines the information and communication technology (ICT) and social capital nexus through the lens of food security policymaking in a developing country. It discusses the different ways smallholder farmers in rural farming communities in western Jamaica harness social capital and use ICTs to obtain information for their agricultural activities. It also identifies the types of social capital present in these farming communities and discusses the interplay between ICT and social capital for the furtherance of food accessibility and food availability in rural communities.

Information and Communication Technology and smallholder farming

The pervasiveness of the Internet and the convergence of digital computing and telecommunications have meant a change in terminology from simply information technology (IT) to information and communication technologies (ICTs) (Heeks, 2002). Nowadays, ICTs refer to a wide range of media, infrastructure, instruments, among other things, which can be further broken down to examine different aspects of old media versus new media, hardware and software, digital and so on. ICT devices facilitate the creation, retrieval, storage and dissemination of information. In much of the recent literature, and for the purposes of this paper, ICTs refer to communication tools such as radio, television, the Internet-enabled applications, mobile telephone and short message service (SMS) devices (see Livingstone, 2002 & Munyua, 2000; Waller, 2009; Yzer & Southwell, 2008 for a discussion).

ICTs have the capacity to enhance development but simultaneously they can serve to reinforce inequities which exist in a community, country or region. Arguably, this dualism, inherent in ICTs, embodies the hopes and fears of societies but its adoption and expansion is still seen as *sine qua non* to development (see Avgerou, 2002; Waller 2009; Wilson, 2004). Proponents of the technology have accentuated the role ICTs play in transforming social landscapes by contributing to the decentralization of activities and making rural areas more attractive to businesses, services and people. Although this fact is undeniable, other scholars have warned that the adoption and use of ICT by alone cannot be seen as a panacea for economic development and, that given all its virtues, ICT should not to be perceived as a magic bullet (Livingstone, 2002; McIntyre, Herren, Wakhungu, & Watson, 2009; Rusten & Skerratt, 2008). Instead they should be viewed as imperfect because there are professed inequalities inherent in all new technologies, including ICTs, at varying levels of abstraction. For instance, at the global

level, the technology gap between developing countries and developed countries is widening; and even within developing countries this gap is increasing. This inequality gives rise to a lack of access to information technology and what is commonly referred to as the digital divide and information asymmetry (Bhavnani, Chui, Janakiram & Silarszky, 2008; Schech, 2002; Servon, 2002).

However, notwithstanding these criticisms, ICTs are regarded as key elements for addressing the multi-faceted challenges facing agriculture. According to the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) (2011) ICTs are critical to guaranteeing food security, boosting productivity, sustaining investment that will increase the supply of food, and integrating the rural development dimensions into agricultural policies. Studies have shown that in the short term, the promise of ICTs is more evident in its enhancement of communication and in the reduction of transaction costs of poor farmers. In developing countries, this is manifested by the spread of mobile phones and village information kiosks, which holds further promise for farmers. With widespread phone services some farmers are increasingly tapping external sources of information on prices and crop management, and identifying pests and diseases remotely (McIntyre et al., 2009; FAO, 2011).

With due consideration for technological determinism, the adoption and use of ICTs can result in net benefits to stakeholders in the agriculture sector. ICTs can enable farmers to gain accurate market information, make contacts, reduce marketing and transaction costs; learn new skills, provide training, and new ideas for achieving household food safety and food security (ECLAC, 2011; Munyua, 2000; Pinstруп-Andersen & Watson II, 2011; see also Kaplan, 2009; Wilson, 2004). However, farmers' uptake of ICTs is often considered modest and their use much lower than that of other industries (Thysen, 2000).

Efforts to increase access to, and use of, ICTs in agriculture in the rural milieu of Latin American and the Caribbean (LAC) are still at an embryonic stage (ECLAC, 2011). Marked by insufficient investment in developing the ICT infrastructure, weak skill base among the populace and unfavorable business conditions which stifle entrepreneurship and innovation (Dutta, Bilbao-Osorio & Thierry, 2013), farmers in the region lag behind their counterparts in other countries in the adoption and use of some ICT tools.

Overview of ICT in Jamaica

In Jamaica, the ICT sector has been one of the fastest growing industries since the government liberalized the mobile telephone market in 2000 and signaled that ICT would be an integral part of economic development plans (Brown & Thompson, 2011; Dunn, Williams, Thomas & Brown, 2011; Waller, 2009). Policymakers enacted the Information and Communications Technology Policy in 2011 which promised, among other things, to improve the country's e-readiness and to expand access to a variety of electronic communication modes for all Jamaicans (Planning Institute of Jamaica, (PIOJ), 2012). However, the *Global Information Technology Report 2013*, ranks Jamaica 85th of 144 countries based on current levels of ICT access, readiness of the society to use ICT, actual ICT use by stakeholders, and the impacts that the technology generates in the economy (Bilbao-Osorio, Dutta & Lanvin, 2014, p.204) . This position represents a decline from 74th of 142 countries in 2012. (Dutta et al., 2012, p.12).

A closer view of the current ICT landscape in Jamaica portrays a mixed scene. One in which there is full mobile penetration rate, declining fixed line telephones (PIOJ, 2012), alongside widespread access and use of both radio and television broadcast media across all

geographic areas, but low adoption and use of computers and the Internet (Dunn, et al., 2011, p. 6). The 2011 population census revealed that of the 28% of households in Jamaica with computers only 19% have Internet access (Golding, 2012). The penetration of broadband technology island wide has been limited and subscriptions have been flat resulting from very low uptake. As a consequence, 60% of households with Internet access are located in the Kingston Metropolitan Area (KMA) (PIOJ, 2012 p. 4.12). The majority of households accessed the Internet via fixed broadband but there is growing evidence of the use of the mobile broadband mode of access (Dunn et al., 2011).

There are many different geographical, social, educational and demographical dimensions to the Jamaican ICT landscape. For instance, Dunn et al. (2011) explained, not surprisingly, that more rural residents than urban residents were non-users of the Internet. They also found that of the non-users surveyed 62.1% indicated that they did not know how to use the Internet and 42% identified self-efficacy with the computer devices as their major challenge (p. 9). Waller (2009) posited that the promotion and adoption of ICT for development (ICT4D) in Jamaica has been retarded because the strategies were heavily based on dominant international discourse that ignored context-specific constraints and structural barriers in the country. This supposition underscores the significance of this study that seeks to fill the gap in the literature and provide specific information, about a sub-sector, previously ignored in policies and projects.

The ICTs and social capital nexus

The rapid rise of ICTs studies in academic scholarship appeared to have paralleled the heightened interest in the concept of social capital. Some scholars have paired the two events

because of the perceived cause and effect relationship they share. ICTs offer the possibilities to make attainable goals of sustained networking, oriented toward establishing and maintaining new or existing ties, and helping individuals overcome the restrictions of their local space (Petrovcic, Petric & Vebovar, 2011; Wilken, 2011). Empirical evidence suggests that where there are frequent interactions in local networks people are more likely to exchange information about their daily lives and this can foster the development of social capital (Isham, 2002; see also Pretty, 2012). ICTs can capture a range of exchange relationships between individuals, groups and institutions, with varying economic, social and political outcomes (Sumit, 2005). They can play a role in reducing poverty, increasing food security and overall livelihood of rural people, by improving smallholder farmers' abilities to use human and social capital more efficiently to make sound decisions (Saghir, Ashfaq & Noreen; 2009; Allahyari, 2009).

Both ICTs and social capital are credited with improving network capabilities and interconnectedness (Hsieh, Rai, & Keil, 2011). The more social capital in a given area, the greater the chances of achieving sustainable rural development, as more relationships of trust at all levels facilitate greater access to the information. Trust, inherent in social capital, is crucial for many ICT-related transactions. Working in tandem, ICTs and social capital are influential in enabling rural population adapt to the accelerating pace of socio-economic, technological, political and other changes (de A. David & Malavassi, 2004; Tripp, 2006).

Owing to changes in the agricultural sector in the last two decades many rural households have been obliged to mobilize their social capital, albeit unconsciously. Because the poor possess very little material assets, modest income or formal education, their survival is based on their abilities to devise strategies that draw on social capital (de A. David & Malavassi, 2004; Woolcock, 2002). Therefore, an understanding of how the social capital, already embedded in

rural communities, can be harnessed will serve as an important tool for use with ICTs to enhance food security policies in developing countries.

The debate surrounding social capital

Social capital has become an important concept, increasingly being regarded by politicians and policy makers as an antidote to a range of social ills (Johnson & Percy-Smith, 2003; Finsveen & van Oorschot, 2008; World Bank, 2001). Some scholars have maintained that social capital acts as an umbrella term, which can be useful for policymaking, because it can be examined at different levels of analysis; from the micro levels to the macro (Lyon, 2000; Tripp, 2006; World Bank, 2001). Researchers can provide an understanding of the levels of social capital in a target area by establishing proxies to account for and measure specific principles. The resulting data can provide valuable insights for policymakers who need evidence-based information for decision-making (Isham, Kelly & Ramaswamy, 2002).

Unfortunately, there is a lack of consensus about the definition, value and measurement of social capital. Despite its popularity and wide usage, ambiguity surrounds the concept regarding whether it can be operationalized and assessed easily for its validity and reliability (Inkeles, 2000; Grootaert & van Bastelaer, 2002); Johnson & Percy-Smith, 2003 van Deth, 2003). Doyens of social capital, such as Bourdieu, Coleman and Putnam, identified reciprocity and trust, as well as the network and social relationships that exist between individuals, as key tenets in defining and understanding the concept (Johnson and Percy-Smith 2003). However, some critics argued that social capital does not take into consideration the issues of class and power that exist in society. They point to the fact that popular indicators, such as membership and participation in organizations, overlook the constraints and commitment of time and money

associated with those activities that are sometimes too much for the poor to afford (Cleaver, 2005; Harriss, 2002). According to these opponents, both social capital and ICTs arguably serve to reproduce and reinforce the power relations and inequities already existing among resource poor groups in society (see Cleaver, 2005; Hoang et al., 2006; McIntyre et al., 2009).

Notwithstanding its contested nature, many scholars agree that social capital is an important element of community decision-making that cannot be ignored in current discussions on national development (Inkeles, 2000; World Bank 2001). Often because social capital is the only asset the poor has access to (Woolcock & Narayan, 2000), it can be viewed as a substitute or a complement to other potentially productive inputs (Isham, Kelly & Ramaswamy, 2002). Woolcock (2002) declared that now that social capital has entered the debate on economic performance, and is making claims as “an independent, and hitherto underappreciated, factor of production”, policy makers can ill afford to ignore forms of social capital that affect economic outcomes (p. 21). This new “economic sociology perspective” sees social capital as a collective resource whose networks act as powerful vehicles to facilitate the diffusion of information, lowering of transaction costs and achievement of other macro outcomes (Webb, 2008, p. 68). Thus, social capital is a vital prerequisite for the adoption of technologies over a large area (Pretty, 2012). Smallholder farmers are an important sub-group for the study of ICT tools, networks and relationships. The information garnered can be used for improving food security policymaking through avenues related to ICTs and social networks. These can be leveraged to provide skills training, accurate and up-to-date information about markets, weather conditions, pest and diseases and crop management among other knowledge.

Types of social capital

The World Bank (2001) regarded different forms of social capital as being instrumental in understanding the levels of interaction among people. These types of social capital included the strong ties which connect family members, close friends and business associates are referred to as *bonding social capital*. The weaker ties which connect individuals from different occupational backgrounds and demographics are called *bridging social capital*. A third type of social capital consists of vertical ties between poor people and people in positions of influence in formal organizations. This is described as *linking social capital* (*emphasis in original*, p.128; see also Putnam, 2000). Pretty (2012) explained that in order to maximize the benefits of social capital individuals and communities need to achieve an optimal mixture of all three types of relationships.

Sadly, there is a dearth of published studies on farmers' information needs, their communication preferences and the impact of ICTs on the agricultural sector in developing countries (Badu et al., 2012; ECLAC, 2011). Molony (2009) lamented this poor understanding and absence of scholarship focusing on the role of social capital in ICT4D. Molony was particularly concerned about the paucity of intricate socioeconomic evidence that employs qualitative methodology to highlight the nuances of the application of ICTs in different sub-sectors in developing countries. He believed this kind of research is important to shed light on the impact of the influx of new communication tools, which demand ongoing assessments, in order to inform the achievement of Millennium Development Goals (MDGs) and other food security-related outcomes.

Research design

This research was conducted using qualitative interviewing techniques to gather information from smallholder farmers in western Jamaica. The in-depth interviews were conducted on the farms of the respondents. The guided conversation gathered data about the farmer's perception of ICTs and how they use those tools to create or maintain relationships. This data collection method enabled the participants to be "meaning makers" when discernable patterns that emerged from their responses were used to inform programs and policies (Tracy, 2013; Warren, 2001).

The interviews and fieldwork took place from December 2012 to January 2013 with farmers who cultivated a marketable surplus of traditional food crops on plots of one to five acres. These farmers were identified using the snowball technique, associated with the theoretical sampling criteria (Charmaz & Belgrave, 2012; Morgan, 2008; Warren, 2001). The interview consisted of 20 questions which captured specific information about the types of ICT devices farmers use, their communication networks, self-efficacy, and the challenges they face accessing and using the devices. Additionally, farmers were asked to discuss their level of participation in agriculture-related community groups and their relationships with other farmers.

The interviews, which lasted between 45 minutes to an hour, were recorded on audio tape and field observations were documented in notes. The voice data were transcribed verbatim and both field notes and transcript data were coded using QSR software (NVIVO 10, 2012) to identify themes. Twelve axial nodes, pertaining to the research objectives were generated to determine paucity or vibrancy of social capital and ICT use by smallholder farmers in the study area. Although qualitative data formed the core component of the interview questions,

supplemental quantitative data were also collected (see Morse, 2012). Quantitative data were organized in Excel for analysis using Statistical Analysis Software (SAS 9.2).

The analysis of the data here builds on a typology generated from smallholder farmers' responses about their motivational orientation for cultivating traditional food crop. The typology produced farmers categorized as *Sustainers*, *Stalwarts*, *Go-getters* and *Entrepreneurs*.

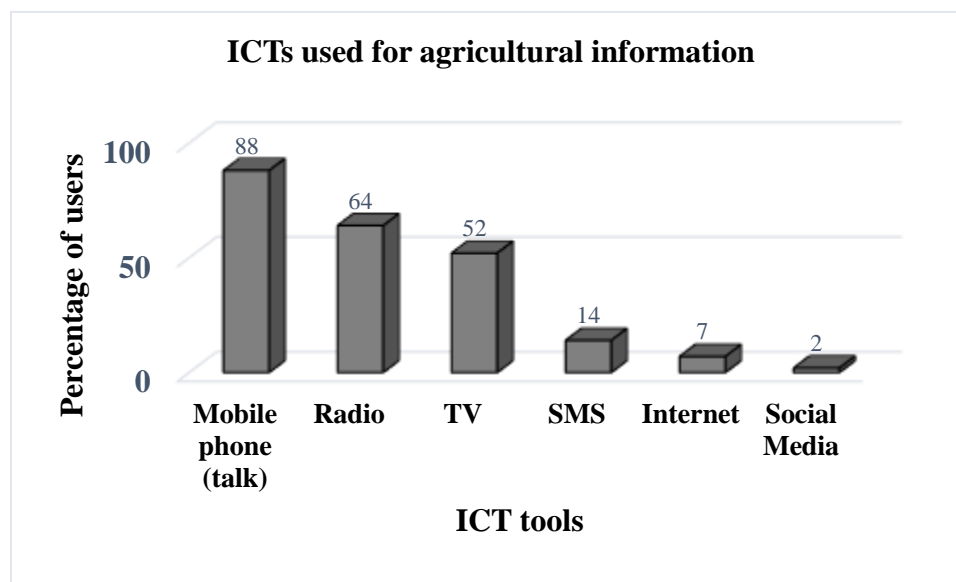
Sustainers, whose rationale for farming was primarily for survival, consisted of 13 participants or 31 % of the sample. *Stalwarts*, described as traditional and commitment to community, were chiefly the descendants of farmers; and *go-getters*, who strived for financial independence and autonomy through farming, each had 11 farmers representing 26% of total respondents, respectively. The fourth and smallest group, called *entrepreneurs*, comprised of 7 farmers (or 17%) motivated by profit. *Entrepreneurs* pursue farming because of the return they can receive on their investment within the sector. The assumption is that farmers' motives and mind-set influence their decisions regarding their adoption of new information technologies as well as their levels of participation in farm-related group activities. This association between the farmers' attitudes and their capacities for using ICTs and social capital is explained below.

Results and discussion

Smallholder farmers in Jamaica have specific information and communication needs because this targeted population requires information that fits important temporal, economic and social situations. Associated with this group's information seeking behaviors were innovations and challenges which revealed how ICTs were adopted and utilized for the maintenance of

networks and improving food security outcomes. The graph below shows the ICT devices and applications smallholder farmers used for information pertaining to their agricultural activities.

Figure 3.1. Smallholder farmers' use of ICTs for agricultural information



Mobile phones (Voice feature)

The findings showed that the voice feature on the mobile phones was the most preferred ICT tool for transferring a variety of information relating to farmers' agricultural activities. All respondents ($N=42$) owned a mobile phone but only 88% reported depending on it its use for agricultural purposes, and could recount the ways they use it for information. The non-users were mostly *sustainers* who reported that they used it mainly for social, non-agricultural purposes. *Entrepreneurs*, *go-getters* and *stalwarts* reported using their mobile phones most frequently to collect specific marketing information. This information included contacting vendors and customers for farm gate sales, making home deliveries, and receiving specific time saving information such as the arrival times of vendors and the quantities of produce to be purchased. A female *go-getter*, with a 20-year farming career conveyed that the mobile phone was

indispensable for a number of transactions, such as connections with others farmers for the procurement of marketable products when her production is limited or unfit for reaping but in general:

I can't do without it...to contact workers,[to] get a ride to mi farm and back from the farm and for getting more food to sell (Female *go-getter*, Interviewee #13)

The farmers in this study used their mobile phones to execute other important transactions such as organizing meetings and mobilizing individuals for field training and workshops at the community level (28%); contacting extension officers and day laborers (21%); overcoming distance and saving time, for instance by ensuring that required items are in stock at the farm store before travelling to the store (19%). Women farmers also reported using the mobile phone to organize and co-ordinate transportation to the local marketplace in the urban centers and to arrange for male relatives to provide security for them and the proceeds of their sale on their return trip home. One *stalwart* summed up the importance of this tool by explaining that:

If mi a go a bush (the farm) and feget (forget) mi phone, mi affi (have to) tun (turn) back to get it 'cause mi feel like half mi life gone (Male, *stalwart* Interviewee # 33)

These time-saving and organizational transactions represent essential context-specific responses to the needs that the smallholder farmers satisfied with the use of the mobile phone. A college-educated male farmer explained that the labor-intensive harvesting practices and the perishable nature of his pepper crop necessitated having as many as 12 day laborers in a single day to for harvesting. For this *entrepreneur*, using the mobile phone to mobilize a workforce, was extremely important for maintaining product quality. This kind of efficiency can enable the smallholder farmer to maximize profit which can, in turn, facilitate investment and increased productivity and ultimately improved livelihood security for the farmer and his workers.

Radio and television

Traditional broadcast devices such as radio and television received high listenership in this study. The radio was used by 64% of all respondents for agricultural information. The *sustainers* were the most avid users of the radio as a source for agricultural information (77%); followed by the *entrepreneurs* (71%), *go-getters* (64%) and *stalwarts* (55%). The farmers used the radio to gather information from regularly scheduled agriculture-related programs such as “Farm Talk,” where industry news and interviews are broadcasted in ten-minute time slots. Weather forecasts and radio talk shows were useful radio programs that farmers listened to. Radio programs provided both a one-way and a two-way means (call-in) for farmers to receive advice or learn about possible solutions vicariously. The portability of the radio was also noted by 14% of the farmers as being a contributing factor to its popularity. The radio was a constant companion, a male respondent explained. He reasoned that he listened to the radio in his home, in his car and on the farm in order to:

Hear about what is happening in the country and hear about what other farmers in the rest of the country are doing (*Entrepreneur*, male, Interviewee #28).

Television was ranked the third most popular ICT device used for agricultural information by the smallholder farmers in this study. The television was used by one-half of the sample (52 %). Respondents cited the nightly weather report and a weekly government-sponsored segment as the programs with important agricultural information on television. The *go-getters* and *sustainers* reported using the television for information, more than *entrepreneurs* and *stalwarts* who showed less interest in accessing agricultural information via this medium. The challenges associated with using this ICT tool are explained later in this paper.

Short Messaging Service (SMS)

Short messaging service (SMS) did not receive widespread use among farmers in this study, as only 12% of total respondents indicated they use it for any of their agriculture informational activities. Surprisingly, the *stalwarts*, the group with the oldest participants, (modal age range is 60-69) were the most active users of SMS for communication. They reported using this medium because it was a cheaper alternative to calling other farmers and useful for sending reminders and confirming other appointments.

Internet and social media

The Internet and social media were the ICT tools with the lowest adoption rates by the farmers. The majority of the respondents had never used the Internet (93%) and more than one-half of the sample (55%) acknowledged that they did not know the name of any social media platform. Only three farmers (7%) reported ever using the Internet for their agricultural activities. The Internet was used by a *stalwart* to source spare parts for a water pump, by an *entrepreneur* to buy seeds and learn about different pesticides and by a female *go-getter* farmer who maintained a blog about her farm. This innovative *go-getter*, Interviewee #39, works in a bank also uses Facebook to sell her farm produce to friends and co-workers in the city. She extolled the values of social media because it has enabled her to showcase her farm produce and improve her network and customer base.

ICTs use by farmer groups

The reasons for non-use of ICT tools in the study area run the gamut. Table 1 below summarizes the ICT behavior of participants in this study, whose modal age range, between 60-69 years, equaled one-third of total respondents.

Table 3.1: ICT use as a percentage of groups by typology

ICTs	Sustainers (%)	Go-getters (%)	Stalwarts (%)	Entrepreneurs (%)
Mobile phone (talk)	69	100	100	100
Radio	77	64	55	71
Television	62	64	41	43
SMS	0	9	36	0
Internet	0	9	9	14
Social Media	0	9	0	0

The data showed that *sustainers*' adoption and use of different ICT tools were the most limited, while *go-getters* used a wider range of ICTs devices for agricultural purposes. *Sustainers*, who mainly became farmers by default because they lacked other marketable skills, were the least likely to adopt and use all the available ICT tools to enhance their farming activities. In general, Internet-based ICT tools received very low utilization.

Major challenges with ICT

Farmers faced various challenges in their efforts to access and use ICT for agricultural information. It was found that the unavailability of Internet access also meant that self-efficacy among the farmers was nearly non-existent. These technological and capacity challenges made the use of Internet enabled ICT a major challenge. As a consequence, smallholder farmers in this study remained largely ignorant of the benefits that could be derived from the use the Internet and its associated applications. Responses about the Internet were short and pointedly:

Internet, no internet not in this area so mi no know wha' fe do (Female Interviewee *Go-getter* #2).

The absence of technological infrastructure in rural communities is the first major obstacle contributing to the smallholder farmers' lack of capacity facing non-users of the Internet and social media.

Non-users of SMS identified self-efficacy as one of the main challenges to using this ICT application. More than one-third (38%) of the informants reported having no knowledge of how to send a text message. However, 42% reported having SMS competencies but are only willing to read text messages, not to send them. The remaining 20% of the participants stated explicitly that they had no interest or desire to learn about using SMS. For these reasons SMS received limited utility and was mainly used for sending reminders and other prompts to farmers. Respondents from all the farmer profile categories noted that SMS was a cumbersome and time consuming process. They also attributed its unpopularity to physical constraints, associated with small keypad found on most of the instruments, and participants' of advanced age inability to see messages clearly due to poor vision. With 31% of the sample having only a beginner's level of education (elementary), the low use of SMS among the members of the farming community could also be the result of an underlying problem of illiteracy.

Links to social capital were inherent in farmer-to-farmer communications and network connections facilitated by ICTs. A farmer reported:

I do everything with my phone, I use it if I am meeting with somebody and to contact vendors, I need it to check the time... for everything...even people I don't know call me and ask to order food from me too (Male, *Go-getter*, Interviewee #25)

As more farmers increase their reliance on mobile telephones for business transactions it implies that trust is also being generated (see de A. David & Malavassi, 2004). The use of the mobile phone eliminates the need for some face-to-face interactions and increases the reliance on trust among users. An awareness of how this aspect of social capital can be harnessed to increase

access to food and availability of food is crucial to community and national food security planning.

Social capital, group membership and network

To further examine the types of social capital and their intensities in the study area, proxies associated with agricultural development were selected. Social capital indicators included membership in community and national organizations, and smallholder farmers' relationships with other farmers in the local communities. In general, the findings showed that membership in the larger nationwide organizations was low. The Jamaica Agricultural Society (JAS), which is the oldest farmers' organization and advocacy group in the country, had the highest level of participation; 43% of total respondents claimed membership. *Sustainers* (46%) and *stalwarts* (45%) were the major supporters of that organization. Farmer registration with the Rural Agriculture Development Authority (RADA), the organization that provides extension services, represented 21% in the study area.

Another important national entity is the People's Co-operative Bank. It is the organization, with offices in many towns and parish capitals, which is most often charged with extending credit to farmers. But only 10% of all the respondents in this study were members of that organization because the smallholder farmers were unwilling to take risks:

Mi no take no loan cause when di crop no come [when the crop fails] and you owe di bank it mek yuh [makes your] life miserable (Male, *Stalwart* Interviewee # 29)

In other cases smallholder farmers face discrimination or are unable to satisfy the requirements for a loan;

When we tried to borrow some money to go into farming; when we were trying to find the land, the banks wouldn't lend any money to us. They point blank told me they don't lend for doing farming because farming is unreliable, they asked how are you going to pay us back (Female *stalwart* Interviewee #23).

When smallholder farmers refuse to participate in credit schemes their abilities to improve productivity and make meaningful contributions to food security outcomes are retarded.

Although these well-established farmer organizations perform core functions that are important to the development of agriculture and food security goals, the levels of participation are at a low ebb in the study area, see Table 2. The result shows that the majority of farmers in this study were not members of any agricultural institutions.

Table 3.2: Respondents participation in agriculture groups in the study area

	Sustainers	Go-getters	Stalwarts	Entrepreneurs	Total
Membership in three or more groups	0	1	0	2	3
Membership in two groups	3	4	2	2	11
Membership in one group	4	2	5	2	13
Membership in no group	6	4	4	1	15
Total	13	11	11	7	42

Upon closer examination of the farmers by their typology, it was shown that *sustainers* were the least likely to be members of organizations while the *entrepreneurs* and *go-getters* were the most group-oriented farmers; 86% and 64 % respectively. These two types of farmers were members of multiple groups (See table 2 above). The majority of *stalwarts* were members of only one group. These low levels of participation in formal national organizations was reflected in the smallholder farmers' inability to capitalize on and build broader networks which can generate bridging and linking social capitals for agricultural development.

Social capital and farmer-to-farmer relations

Farmers were asked to describe their relationship with other farmers and their participation in community groups, to gauge the strength of networks present in the study area. The findings revealed that 74% of respondents receive help from family members with farming activities such as planting, weeding and harvesting. The close family relations and ties between neighbors and friends are emblematic of high bonding social capital. A new farmer in her first year of production confessed that:

I have to borrow everything I use on my farm. I only own a hoe. Somebody lend me a drum to hold water and I borrow fork [digging fork] when I have working [work-days] (Female, Sustainer, Interviewee#10)

Respondents detailed the ease with which they were able to make contact with other farmers when they wish to borrow extra farm tools for a work day or a donkey or mule for a few hours to carry harvested crops from the field. Fifty-two per cent of respondents acknowledged that farmers were willing to share small agricultural equipment such as knapsack sprayers, sprinklers or hose for irrigation, forks and hoes.

Another community level activity that was indicative of the presence of social capital was the levels of participation in organic community-based groups. Twenty-nine per cent reported membership in community farm groups. These local groups specialized in addressing the needs of its members. For instance, in the hilly communities in Trelawny, one farm group has a mule-breeding program to enable the farmers in that area to have access to these sure-footed animals that are needed to transport people and food to and from the remote farms. Another farm group in Saint James raised funds for the construction of a small dam on a local river to supply water for irrigation. In Saint Elizabeth, a farm group with a tractor provides members with land preparation services at a discounted price and earns additional income by providing similar

services to other farmers in the surrounding areas. This is evidence that suggests the existence of bonding social capital that facilitates the pooling of resources in the farming communities.

However another perspective was delivered from a local farm group president:

...the only time they are actively part of the group is when something come for handout. If we get some seeds or fertilizer, like now 'cause the hurricane shake up the crops, then everybody become group member. Around here you just have 2 or 3 regular (members) but after the something done dem [they] disappear (and) you no see dem [them] again (Female *Stalwart*, Interviewee#23).

The obvious free-rider attitude among some smallholder farmers resulted in inconsistent group participation within the sub-group, despite the presence of strong bonding social capital.

The most glaring gaps in the network of the smallholders showed up when responses were given about the sharing of market information as a proxy for gauging social capital. It revealed that farmers perceived other farmers were unwilling to share information about new or existing market opportunities. *Stalwarts* (82%); *go-getters* (55%) and *sustainers* (46%) asserted that their colleagues rarely shared market information with them. (*Entrepreneurs* generally have contracts and therefore would seldom solicit new market information from other farmers). It is possible that one factor contributing to the lack of shared market information was the paucity of bridging and linking social capital which existed amongst the farmers. The low levels of smallholder farmers' participation in government-sponsored, national agencies (linking) and with people outside of their immediate area (bridging) suggest that farmers may not be aware of any new agricultural marketing opportunities. The participants experienced similar constraints associated with low levels of group participation and limited connections with external stakeholders. Therefore, greater efforts are needed to encourage the use of ICTs that can improve information flow and build different types of social capital in agricultural networks in rural communities.

The creation of bridging and linking social capital requires more spatially distanced connections and breaking out of the comfortable closely connected ties that they are familiar with. The importance of capturing other dimensions of social capital through more varied relations and using those networking capacities to expand efficiencies cannot be exaggerated. However, the results showed that these smallholder farmers' relationship with the intermediaries of national organizations and stakeholders farther afield are at best tenuous. ICTs allow information to be shared more effectively over great distances. This can facilitate the strengthening of networks between farming communities and among stakeholders in the wider food system to boost the production and distribution of food in Jamaica. Connections with influential and distanced contacts are crucial to the network capabilities of smallholder farmers because they can help generate bridging and linking social capitals which remains sparse in the study area.

Conclusion

In the main, smallholder farmers in western Jamaica harnessed bonding social capital, used the mobile phone to maintain their agricultural networks and received agricultural information from radios and via farmer-to-farmer communication. They experienced reduced transaction costs and save time by using their mobile phone extensively to mobilize other farmers for work, transport and meetings. In their rural setting, the television remains an underutilized resource for the transference of information but the radio received high listenership. Other ICT tools, such as computers and the Internet, remain underexploited for reasons, such as the lack of access due to limited infrastructure, ignorance about the potential benefits and a lack of interest by an aging farmer population.

Applying social capital and ICT to food security policymaking

The evidence showed that radio and mobile telephones are popular tools among this target population, thus a tele-center approach to information transfer should be a consideration for maximizing the benefits of these tools. This method of information transfer could be enhanced by intermediaries with Internet access who could channel information to farmers via mobile phones and radios (see Huyer, 2006; James, 2004). Smallholder farmers, such as *sustainers*, with limited formal education and less motivation to participate in groups, would accrue benefit from listening to the radio and participating in the exchange using their mobile phones. Furthermore, *Stalwarts* in this study showed an aptitude for using SMS, therefore a targeted program could be designed to enhance their competences and further encourage the adoption of that medium. But all smallholder farmers need to be educated about the benefits that can be derived from new communication technologies. This would likely increase ICT adoption and improve food access and food availability at the community and national levels.

The literature indicates that as small farmers become more aware of the benefits associated with ICTs they are likely to develop more relations with different stakeholders within the agriculture value-chain and beyond. Policymakers in Jamaica will need to give consideration to a two-pronged approach that incorporates infrastructure development and capacities building. *Entrepreneurs* and *go-getters* are profit-oriented and enterprising, making them prime candidates to be taught ICT skills that can help to them increase their profit margins and be more efficient in their businesses. Given the vibrancy of bonding social capital in the area, these farmers could also provide a service for other smallholder farmers and improve networks and information flow.

The interplay between ICTs use, mobile phones in particular, and social capital is captured by the participants' abilities in effectively maximize their relationships with others to

organize work days, arrange group transportation to markets and share small farm equipment with each other. Similar empirical evidence from Kenya found that mobile telephone, the voice feature specifically, received very high usage among farmers and was used to strengthen social ties with friends and family (Okello, Okello & Ofwona-Adera, 2010). Development practitioners and policymakers in Jamaica should seek to facilitate ICT adoption by drawing upon available social capital already embedded in these rural communities. The intensity of bonding social capital, represented by strong local ties in the study, is unmatched by other types of social capital. The paucity of significant bridging and linking social capitals means that farmers are trapped in networks with other people who are stymied by similar challenges. ICTs tools hold the solution that can potentially help with this problem.

Harnessing social capital and using different ICT resources are ways in which both food and information can be transferred to improve food security outcomes. But policies are needed to address the many gaps related to technological infrastructure, capacity and education within the farming communities of western Jamaica. Portes and Landolt, (2000) concluded that in order for social capital to be of any significance there must be investments of some material resources. The lack of adequate infrastructure and human resources combine to form obstacles to food security. In this milieu, political will has a role to play in the provision of an enabling environment, policies and public goods for the development. The essential macroeconomics policies and physical and social infrastructure, together with the accompanying institutions and regulations, will be created only if there is a supportive governance structure (Conway & Wilson, 2012). ICTs and social capital taken together, can help to produce well-connected smallholder farmers in well-connected societies that can be more productive and make more meaningful contributions to food security outcomes in developing countries, such as Jamaica.

REFERENCES

- Allahyari, M. S. (2009). Potentials of New Information and Communication Technologies (ICTs) in Agriculture Sector. *Proceedings of the Tenth International Agricultural Engineering Conference*, Bangkok, Thailand (7-10 December 2009).
- Avgerou, C. (2002). *Information systems and global diversity*. New York, NY: Oxford University press.
- Badu, S. C., Glendenning, C. J., Asenso-Okyere, K. & Govindarajan, S. K. (IFPRI) (2012). Farmers' Information Needs and search behaviors: Case study in Tamil Nadu, India. International Food and Policy Research Institute (IFPRI). Discussion paper 01165. Retrieved from <http://www.ifpri.org/sites/default/files/publications/ifpridp01165.pdf>
- Bhavnani, A., Chui, R., Janakiram, S. & Silarszky, P. (2008). The role of mobile phones in sustainable rural poverty reduction. Retrieved from http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/The_Role_of_Mobile_Phones_in_Sustainable_Rural_Poverty_Reduction_June_2008.pdf
- Bilbao-Osorio, B., Dutta, S. & Lanvin, B. (Eds.). (2014). *The Global Information Technology Report 2013: Growth and jobs in a hyperconnected world*. Retrieved from http://www3.weforum.org/docs/WEF_GITR_Report_2013.pdf
- Brown, D. H. & Thompson, S. (2011). Priorities, policies and practice of e-government in a developing country context: ICT infrastructure and diffusion in Jamaica. *European journal of information systems* 20, 329–342.
- Cleaver, F. (2005). The inequality of social capital and the reproduction of chronic poverty. *World development* 33(6), 893-906.
- Charmaz, K. & Belgrave, L. (2012). Qualitative interviewing and grounded theory analysis. In, J. Gubrium, J. Holstein, A. Marvasti & K. McKinney (Eds.), *The sage handbook of interview research: The complexity of the craft* (pp. 347–365). Thousand Oaks, CA: Sage Publications Inc.
- De A. David, M. B. & Malavassi, L. M. O. (2004). Social capital and rural policies: starting point or finishing point? In, R. Atria, M. Siles, I. Arriagada, L. Robison & S. Whiteford (compilers) *Social capital and poverty reduction in Latin America and the Caribbean: Towards a new paradigm* pp. 421- 460. Santiago, Chile: United Nations and European Commission for Latin America and the Caribbean (ECLAC).
- Dunn, H., Williams, R., Thomas, M. & Brown, A. (2011). *Caribbean ICT indicators and broadband survey: Jamaica*. Kingston, Jamaica: University of the West Indies.
- Dutta, Soumitra, Bilbao-Osorio, Beñat & Geiger, Thierry. (2013). The networked readiness index 2012: Benchmarking ICT progress and impacts for the next decade. In, S. Dutta & B. Bilbao- Osorio (Eds.), *The Global Information Technology Report 2012: Living in a hyperconnected world*, (pp. 3 – 29). Retrieved from http://www3.weforum.org/docs/Global_IT_Report_2012.pdf

- Economic Commission of Latin America and the Caribbean (ECLAC) - (Food and Agriculture Organization (FAO) - Inter-American Institute for Cooperation on Agriculture (IICA). (2011). *The outlook for agriculture and rural development in the Americas: A perspective on Latin America and the Caribbean 2011-2012*. Retrieved from http://www.eclac.org/publicaciones/xml/6/44826/Perspectivas_agricultura2011_ingles-web.pdf
- Finsveen, E. & van Oorschot, W. (2008). Access to Resources in Networks: A theoretical and Empirical Critique of Networks as a Proxy for Social Capital. *Acta Sociologica* 51(4), 293-307.
- Food and Agriculture Organization (FAO). (2011). *Looking Ahead in World Food and Agriculture: Perspectives to 2050*. Rome. Italy: United Nations.
- Golding, P. (2012, November 11). ICT and the census. *Sunday Gleaner* Retrieved from <http://jamaica-gleaner.com/gleaner/20121111/focus/focus6.html>
- Grootaert, C. & van Bastelaer, T. (Eds). (2002). *Understanding and Measuring Social capital: A Multidisciplinary Tool for practitioners*. Washington, D.C.: The World Bank.
- Harriss, J. (2002). *Depoliticizing development: The World Bank and social capital*. London, UK: Anthem Press.
- Heeks, R. (2002). I-Development not e-Development: Special issue on ICTs and development. *Journal of international development* 14(1), 1-11.
- Herbel, D., Crowley, E., Ourabah-Haddad, N. & Lee, M. (2012). Good practices in building innovative rural institutions to increase food security. Retrieved from <http://www.fao.org/docrep/015/i2258e/i2258e00.pdf>
- Hoang, L. A., Castella, J. & Novosad, P. (2006). Social networks and information access: Implications for agricultural extension in a rice farming community in northern Vietnam. *Agricultural and human values* 2(4), 513–527.
- Hsieh, P. J., Rai, A. & Keil, M. (2011). Addressing digital inequality for the socioeconomically disadvantaged through government initiatives: Forms of capital that affect ICT utilization. *Information systems research* 22(2), 233-253.
- Huyer, S. (2006). Understanding Gender equality and women's empowerment. In, N. Hafkin & S. Huyer (Eds.), *Cinderella or cyberella?: Empowering women in the knowledge society* (pp. 15 -48). Bloomfield, CT: Kumarian Press Inc.
- Inkeles, A. (2000). Measuring Social capital and its consequences. *Policy Sciences* 33, 245-268.
- Isham, J. (2002). Can investment in social capital improve local development and environmental outcomes? A cost-benefit framework to assess the policy options. In, J. Isham, T. Kelly and S. Ramaswamy (Eds.), *Social capital and economic development* (pp. 159-175). Cheltenham: Edward Elgar Publishing Inc.

- Isham, J., Kelly, T. & Ramaswamy, S. (2002). Social capital and Well-being in developing countries: an introduction. In, J. Isham, T. Kelly and S. Ramaswamy (Eds.), *Social capital and economic development* (pp. 3-17). Cheltenham, UK: Edward Elgar Publishing Inc.
- James, J. (2004). *Information technology and development: A new paradigm for delivering the Internet to rural areas in developing countries*. New York, NY: Routledge.
- Johnson, G. & Percy-Smith J. (2003). In search of Social capital. *Policy and Politics* 31(3), 321-334.
- Kaplan, D. (2009). *Readings in the Philosophy of Technology*. Lanham, MD: Rowman & Littlefield Publishers Inc.
- Livingstone, S. (2002). Part 1. The changing social landscape. In, L. Lievrouw & S. Livingstone (Eds.), *Handbook of new media: social shaping and consequences of ICTs* pp. 17- 21. Thousand Oaks, CA: SAGE Publications Inc.
- Lyon, F. (2000). Trust, networks and norms: The creation of social capital in agricultural economies in Ghana. *World Development* 28(4), 663-681.
- Mangstl, A. (2008). Emerging issues, priorities and commitments in e-Agriculture. *Agricultural information worldwide* 1(1), 5-6. Retrieved June 20, 2013 from <http://journals.sfu.ca/iaad/index.php/aginfo/article/view/1/2>
- McIntyre, B., Herren, H., Wakhungu, J. & Watson, R. (Eds.) (2009). *International assessment of agricultural knowledge, science and technology for development (IAASTD): Global report*. Washington D.C.: Island Press.
- Molony, T. (2009). Carving a niche: ICT, social capital, and trust in the shift from personal to impersonal trading in Tanzania. *Information technology for development* 15(4), 283 – 301.
- Morgan, D. (2008). Snowball sampling. In L. Given (Ed.), *The SAGE encyclopedia of qualitative research methods*. (pp. 816-817). Thousand Oaks, CA: SAGE Publications, Inc. doi: 10.4135/9781412963909.n425
- Morse, J. M. (2012). The implications of interview type and structure in mixed-methods designs. In, J. Gubrium, J. Holstein, A. Marvasti & K. McKinney (Eds.), *The sage handbook of interview research: The complexity of the craft* (pp. 193–204). Thousand Oaks, CA: Sage publications Inc.
- Munyua, H. (2000). Information and Communication Technology for rural development and food security: Lessons from field experiences in developing countries. Retrieved from www.fao.org/sd/cddirect/cdre0055b.htm.
- Okello, J. J., Okello, R. M., & Ofwona-Adera, E. (2009). Awareness and use of mobile phones for market linkage by smallholder farmers in Kenya. In, B. Maumbe & V. Owei (Eds.) *E-*

- Agriculture and E-government for global policy development: Implications and future directions*, (pp. 1-17). Hershey, PA.: IGI Global.
- Petrovic, A., Petric, G., and Vebovar, V. (2011). Network and mobile sociality in personal communities: Exploring personal networks of ICT users. In, R. Ling & S. W. Campbell (Eds.), *Mobile communication: Bringing us together and tearing us apart* (pp. 181- 209). New Brunswick: Transaction Publishers.
- Pinstrup-Andersen, P. & Watson II, D. D. (2011). *Food Policy for developing countries: The role of Government in global, national and local food systems*. Ithaca, New York: Cornell University Press.
- Planning Institute of Jamaica (PIOJ). (2012). *Economic and Social Survey of Jamaica: 2011*. Kingston, Jamaica: Planning Institute of Jamaica.
- Portes, A. & Landolt, P. (2000). Social capital: Promise and pitfalls of its role in development. *Journal of Latin American studies* 32(2), 529 -547.
- Pretty, J. (2012). Agriculture and food systems: Our current challenge. In, P. Stock, H. Campbell & C. Rosin (Eds.), *Food systems failure: the global food crisis and the future of agriculture* (pp. 17-29). Abingdon, Oxon: Earthscan.
- Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York, NY: Touchstone Book, Simon & Schuster Inc.
- QSR International (2012). NVIVO 10 student. www.qsrinternational.com
- Reid, C. & Salmen, L. (2002). Qualitative Analysis of Social Capital: The case of Agricultural Extension in Mali. In The World Bank, *Understanding and Measuring Social Capital: A Multidisciplinary Tool for Practitioners*, pp. 85-107. Washington D.C., U.S.A.: World Bank
- Rusten, G. & Skerratt, S. (2008). Being Rural in a digital age. In, G. Rusten & S. Skerratt (Eds.), *Information and communication technologies in the rural society: Being rural in a digital age*, (pp. 1-15). New York, NY: Routledge.
- Saghir, A., Ashfaq, M., & Noreen, A. (2009). Gender and Information and Communication Technologies (ICTs). *Journal of Animal and Plant Sciences*, 19 (2), 94-97.
- Schech, Susanne. (2002). Wired for Change: The links between ICTs and Development Discourses. *Journal of International Development* 14, 13-23.
- Servon, Lisa. (2002). *Bridging the digital divide: Technology, community, and public policy*. Malden, MA: Blackwell Publishers Ltd.
- Srinivasan, Ancha (2006). Precision Agriculture: An Overview In, A. Srinivasan (Ed.), *Handbook of Precision Agriculture: Principles and Applications* (pp. 3-18). New York: Haworth Press Inc.

- Sumit, Roy. (2005). *Globalization, ICT and Developing Nations: Challenges in the information age*. New Delhi, India: Sage publications Inc.
- Tracy, Sarah, J. (2013). *Qualitative research methods: collecting evidence, crafting analysis, communicating impact*. Somerset, NJ: Blackwell Publishing Ltd.
- Thysen, Iver. (2000). Agriculture in the information society. *Journal of agricultural engineering* 76, 297 - 303.
- Tripp, Robert. (2006). *Self-Sufficient Agriculture: Labour and Knowledge in small-scale farming*. London, UK: Earthscan
- van Deth, Jan, W. (2003). Measuring Social Capital: Orthodoxies and Continuing Controversies. *International Journal of Social Research Methodologies* 6(1), 79-92.
- Waller, Lloyd. (2009). *The role of discourse in ICT for development: Lessons from Jamaica*. Saarbrücken, Germany: VDM Verlag Dr. Muller Aktiengesellschaft.
- Warren, C. (2001). Qualitative interviewing. In, J. Gubrium & J. Holstein (Eds.) *Handbook of interview research: Context and method* (pp.83-101). Thousand Oaks, CA: Sage publications Inc.
- Webb, C. (2008). Measuring Social Capital and Knowledge Networks. *Journal of Knowledge Management* 12(5), 65-78.
- Wilkens, R. (2011). Bonds and bridges: Mobile phone use and social capital debates. In, R. Ling & S.W. Campbell (Eds.), *Mobile communications: Bringing us together or tearing us apart* (pp. 127-148). New Brunswick, New Jersey: Transaction Publishers.
- Wilson, E. J. (2004). *The information revolution and developing countries*. Cambridge, MA: The MIT press.
- Woolcock, M. & Narayan, D. (2000). Social capital: Implications for development theory. *World Bank research observer* 15(2), 225-249.
- Woolcock, M. (2002). Social Capital in Theory and Practice: Where do we Stand? In J. Isham, T. Kelly, and S. Ramaswamy (Eds.), *Social capital and Economic Development: Well-being in Developing Countries*, (pp. 18-34). Cheltenham, U.K.: Edward Elgar Publishing Ltd.
- World Bank/ The International Bank of Reconstruction and Development. (2001). *World Development Report 2001/2001: Attacking poverty*. New York, N.Y.: Oxford University Press.
- Yzer, M. & Southwell, B. (2008). New communication technologies, old questions. *American behavioral scientist* 52(1), 8–20.

APPENDICIES

December 13, 2012

MEMORANDUM

TO: Deborah Brown
Jennie Popp

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 12-11-272

Protocol Title: *Food Security in Jamaica*

Review Type: ☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB

Approved Project Period: Start Date: 12/13/2012 Expiration Date: 12/12/2013

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 50 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

Interview Protocol for Jamaican Farmers

Interviewee Number: _____

Q1. How many years have you been a farmer? _____ years.

Q2. Why did you decide to become a farmer? _____
_____.

Q3. Do you have the following traditional crops on your farm?

Q4. If Yes in Q3, state how much of each produce is sold, used in the home, stolen or other uses?

1= None of it

2= Some of it

3= Most of it

Traditional Crops	Yes	No				
			Used in home	Sold on the market	Lost to thieves	Other
<u>Tree Crops</u>						
Ackee						
Plantains						
Bananas						
Breadfruit						
<u>Root and Tubers</u>						
Cassava						
Dasheen						
Sweet potato						
Yams						
<u>Vegetables</u>						
Calaloo						
Sorrel						
Peas						

Other						

Q5. How has the composition of your crops changed in the last three (3) years? **In the last 3 years...**

“I have planted more _____ but less _____ because _____.”

OR

“It has not changed because _____.”

Q6. Please tell me the name a traditional food which does **not grow well** in your district and why?

Q7. I am going to ask you to think about the last three years (2010-2012), Please tell me approximately, what percentage of your household income has come from your farming activities?

Years	2010	2011	2012
<i>Estimated percentage of household income from farming</i>			

Q8. Let's talk about work on your farm. I going to list some farming activities please tell me, who does the following activities on your farm and Why?

[Reasons: financial reasons, informal sharing agreements, family responsibility, availability at needed time, other]

Farming Activity	Who	WHY?
-------------------------	------------	-------------

Land preparation		
Planting		
Weeding		
Harvesting		
Marketing		

Q9. I am going to list some possible challenges farmers in Jamaica might face, please rank the following challenges according to your experience in your crop production?

1 = no challenge

2 = minor challenge

3 = major challenge

Potential Challenge	Rank Challenge	Potential Challenge	Rank Challenge
Availability of seeds or suckers		Availability of labor	
Availability of fertilizer		Spoilage – in field	
Affordable fertilizer		Praedial larceny	
Availability of pesticide		Access to good roads to the market	
Affordable pesticide		No market for my crop (oversupply)	
Available machinery		Marketplace conditions (physical/infrastructure)	
Technical advice		Time to spend on the farm	
Weather-related problems		Other	

Q10. Are there other challenges you face that are not mentioned above? YES ☐ NO ☐

_____ .

Q11. Now, I am going to list possible successes farmers in Jamaica might experience; Please rank the following successes according to your experience in your crop production?

1 = no success

2 = minor success

3 = major success

Potential Success	Rank	Potential Success	Rank
Good yields for my crops		Having food to share with friends	
Planning crop production to receive high prices at the market		Producing better (quality) crops than my neighbors	
Always having food to contribute to family's meals		Continuing the tradition of agriculture in the district	
Providing job opportunities in my district		Practicing soil conservation on my farm	
Use of new farming method/s		Being recognized by others for my knowledge of good farming practices	

Q12. Are there other things you have achieved that are not mentioned here? YES ☐ NO ☐

_____.

Q13. Please give your opinion of women farmers in your area.

- c. List **two** ways in which you think women farmers are the similar to you.
- d. List **two** ways in which you think women farmers are the different from male farmers.

[Possible prompts for differences and similarities: Size of plot, crop yields, level of effort in agricultural production, prices received for crops, how harvested crops are used (sold, home use, etc), distance of plot from home, younger/older, access to resources, reasons for farming, any other reasons?]

About Women Farmers	
Similarities	Differences
II.	IV.

V.	VI.
----	-----

Q15. This next question is about groups. Are you a member of any of the following agricultural group(s) in your area?

Types of Group	YES	NO
Producer Marketing Organization (PMO)		
Jamaica Agricultural Society (JAS)		
Peoples' Co-operative Credit Union		
Other		

Q16. Do farmers in your district co-operate with each other/ share resources in the following ways? If Yes, Please give an example

Farming activities	YES	NO	If YES, Examples of co-operation
Labor			
Marketing			
Equipment			
Information sharing			
Other (Saving clubs)			

Q17. *Information and Communication Technologies (ICTs) tools include Radio, Television, Internet, Mobile phone.* Have you ever use any of the following ICTs for agricultural information?

If Yes, please give one example

Information and Communication Technologies (ICTs)	YES	NO	If YES, Give one example
Radio			
Television			
Internet			
Mobile phone (Talk)			
Mobile phone (Text/SMS)			
Social Media			

Q18. How would you rank the challenges you experience in getting agricultural information using the following ICTs? Please justify your ranking.

1 = No Challenge

2 = Minor Challenge

3 = Major Challenge

Information and Communication Technologies (ICTs)	Rank Challenges	Justification of Ranking
Radio		
Television		
Internet		
Mobile phone (Talk)		
Mobile phone (Text)		
Social Media		

Q19. Kindly provide me with the following demographic information.

Factors	
Gender	_____ Male _____ Female

Marital Status	_____ Single _____ Common Law Relationship _____ Married _____ Divorced _____ Widowed
How many people live in your household?	_____ Children 0 to 17 years _____ Adults 18 or older
Level of Education	_____ Primary _____ Secondary _____ Technical/Vocational Training _____ Tertiary
Other sources of household income	_____ Livestock _____ Part-time job _____ Full time job _____ Seasonal job _____ Partner's job _____ Remittances _____ Other
What age range represents you?	_____ 18-29 _____ 30-39 _____ 40-49 _____ 50-59 _____ 60-69 _____ 70+

Q20. What advice do you have for someone interested in going into farming in Jamaica today?

Screenshot of ICT data coded in NVIVO Qualitative data analysis software

interviews.nvivo - NVivo

Look for: Search in: Nodes Find Name Clear Advanced Find

Nodes	Source	References	Created On	Created By	Modified On	Modified By
Share farm implements	22	23	6/11/2013 10:58 PM	DEB	6/25/2013 6:27 PM	DEB
SMS for Ag info	28	43	6/10/2013 10:06 PM	DEB	6/23/2013 9:33 PM	DEB
infrequent SMS use	6	6	6/16/2013 5:52 PM	DEB	6/22/2013 7:17 PM	DEB
Reasons for non-use SMS	32	37	7/6/2013 11:46 PM	DEB	7/6/2013 11:53 PM	DEB
Using SMS	5	7	7/6/2013 11:52 PM	DEB	7/6/2013 11:53 PM	DEB
Social Media	42	42	6/10/2013 10:06 PM	DEB	6/23/2013 9:39 PM	DEB
TV for Ag info	35	40	6/10/2013 9:46 PM	DEB	6/23/2013 9:37 PM	DEB
Kinds of Ag info-TV	10	11	7/7/2013 12:01 AM	DEB	7/7/2013 12:02 AM	DEB
Reasons for non-use TV	17	21	7/6/2013 11:58 PM	DEB	7/7/2013 12:02 AM	DEB
TV minor challenge	11	11	6/12/2013 9:53 PM	DEB	6/22/2013 6:52 PM	DEB
watch the new programs	30	14	6/14/2013 11:06 PM	DEB	6/23/2013 5:47 PM	DEB
Use of mobile phone- talk	42	42	6/10/2013 9:28 PM	DEB	7/8/2013 3:01 PM	DEB
ask questions	3	3	6/12/2013 10:44 AM	DEB	6/19/2013 9:00 PM	DEB
call extension officers	3	3	6/12/2013 9:44 PM	DEB	6/21/2013 9:48 AM	DEB
delete mobile phones	1	1	7/7/2013 1:38 PM	DEB	7/7/2013 1:38 PM	DEB
give instructions to workers	5	5	6/12/2013 9:44 PM	DEB	7/7/2013 1:42 PM	DEB
Manage network	5	0	7/7/2013 12:07 AM	DEB	7/7/2013 12:07 AM	DEB
call other farmers	11	11	6/12/2013 9:43 PM	DEB	6/23/2013 5:48 PM	DEB
contact with customers	7	7	6/15/2013 3:33 PM	DEB	6/23/2013 5:50 PM	DEB
contact with vendors	11	11	6/14/2013 11:29 AM	DEB	6/23/2013 5:43 PM	DEB
organize workshop-meeting	12	12	6/15/2013 3:32 PM	DEB	6/22/2013 8:13 PM	DEB
Reduce transaction costs	0	0	7/7/2013 12:08 AM	DEB	7/7/2013 12:08 AM	DEB
addressing needs from a distance	16	16	6/11/2013 10:51 PM	DEB	6/22/2013 8:13 PM	DEB
get things done quickly	3	3	6/17/2013 10:30 PM	DEB	6/21/2013 6:19 PM	DEB
test service	1	1	6/14/2013 11:33 AM	DEB	6/14/2013 11:33 AM	DEB
transport to ink	3	3	6/10/2013 9:52 PM	DEB	6/22/2013 11:01 AM	DEB

DEB: 277 items

Screenshot of data coded in NVIVO Qualitative data analysis software

interviews.nvivo - NVivo

Look for: Search in: Nodes Find Name Clear Advanced Find

Nodes	Source	References	Created On	Created By	Modified On	Modified By
Labor in farm areas	24	29	6/10/2013 9:58 PM	DEB	6/23/2013 5:14 PM	DEB
Common complaints re labor	10	20	7/6/2013 10:10 PM	DEB	7/6/2013 10:18 PM	DEB
breakdown in traditional labor practice	2	2	6/15/2013 6:52 PM	DEB	6/21/2013 9:46 AM	DEB
expectations of laborer	5	5	6/10/2013 9:13 PM	DEB	6/23/2013 9:36 PM	DEB
hard to get help	6	6	6/10/2013 9:10 PM	DEB	6/23/2013 9:14 PM	DEB
no money to help	4	4	6/10/2013 9:11 PM	DEB	6/21/2013 9:05 AM	DEB
poor quality of work	3	3	6/17/2013 10:04 PM	DEB	6/23/2013 9:14 PM	DEB
no cooperation	4	4	6/10/2013 9:09 PM	DEB	6/21/2013 9:46 AM	DEB
Options available to farmers	4	5	7/6/2013 10:17 PM	DEB	7/6/2013 10:18 PM	DEB
yes farmers help with labor	10	15	6/11/2013 9:52 PM	DEB	6/22/2013 7:59 PM	DEB
Major success	11	11	6/12/2013 9:06 PM	DEB	7/15/2013 9:25 PM	DEB
Male	16	16	6/12/2013 10:07 PM	DEB	7/15/2013 9:25 PM	DEB
30-39	3	3	6/18/2013 10:31 AM	DEB	6/18/2013 9:09 PM	DEB
40-49	5	5	6/14/2013 6:57 PM	DEB	6/23/2013 9:24 PM	DEB
50-59	5	5	6/16/2013 6:05 PM	DEB	6/22/2013 6:23 PM	DEB
70+	3	3	6/21/2013 7:32 PM	DEB	6/22/2013 9:19 AM	DEB
Male whole interview guide	16	16	7/6/2013 12:15 PM	DEB	7/6/2013 12:16 PM	DEB
Market cooperation	18	18	6/10/2013 9:17 PM	DEB	6/23/2013 6:25 PM	DEB
Mobile phone challenges	37	37	6/10/2013 10:03 PM	DEB	6/23/2013 6:32 PM	DEB
major challenge-cell	3	3	6/15/2013 2:02 PM	DEB	6/23/2013 5:20 PM	DEB
minor challenge-cell	5	5	6/14/2013 11:10 PM	DEB	6/23/2013 6:17 PM	DEB
no challenge	30	30	6/10/2013 10:04 PM	DEB	6/23/2013 6:32 PM	DEB
unfamiliar with phone use	4	4	6/16/2013 8:37 PM	DEB	6/23/2013 6:20 PM	DEB
Mobilization	42	42	6/10/2013 3:15 PM	DEB	6/23/2013 6:06 PM	DEB
Independence	28	38	7/7/2013 12:26 AM	DEB	7/15/2013 9:23 PM	DEB
Intentional farmers	10	13	7/7/2013 12:21 AM	DEB	7/15/2013 9:23 PM	DEB

DEB: 277 items

CHAPTER 4. AGRICULTURAL POLICY DISCOURSE 2003-2013 AND THE WELFARE OF SMALLHOLDER FARMERS IN JAMAICA

Abstract

The real impact policies are not always self-evident, thus the strategies put forward as the solution to a public problem should not be taken for granted. This longitudinal study used sectoral Parliamentary discourse to lay bare the political economy of food security. It seeks to understand how smallholder farmers are constructed socially and what the shared meanings are among that target population in Western Jamaica. The paper presents the context and larger meanings in which farmers stories and agricultural policy content are embedded. Discourse analysis is an effective tool used to analyze text and explore the outcomes of discourse in terms of actions and perceptions.

The results showed that policymakers in Jamaica take a top-down productivist approach to achieving food security. Export oriented policy frames remain dominant in the discourse and the text revealed a traditional slant toward farmers who have the resources to invest in commercial agriculture. Smallholder farmers were encouraged to increase their production of traditional food crops for local consumption and for new markets, however there were often constructed in the text as static and lacking the capacity to achieve said goals. Plans to improve smallholder farmers' agency were sparse and did not address major challenges experienced by the participants in this study. In addition, the findings exposed the limited inter-sectoral collaborations, the absence of a compressive plan to mitigate food insecurity and lack of proactive strategies to address the impact of new challenges such as climate change.

Keywords: food security, discourse analysis, smallholder farmers

Introduction

Agricultural policies are often viewed as being different from other policy areas because traditionally they have been undertaken in relatively closed policy networks (Daugbjerg & Swinbank, 2012) and are renowned for their intensive interaction between farmers and government (Grant, 2012). Agriculture's exceptionalism has been justified because of the contribution it makes to national goals, the concerns for food security and the sector's susceptibility to natural risks (Coleman, Skogstad & Atkinson, 1997; Grant 1995). However today, agriculture can no longer be a policy silo because the agricultural policy agenda has been widened to include many issues and actors. Agricultural policy concerns include, more than just production and distribution. Agricultural policies are inextricably linked to food policy, food safety, bioterrorism, climate change and the role of biotechnology among other complex problems such as the emergence of ethical standards in global food and health-related problems (Andersen & Watson II, 2011; Daugbjerg & Swinbank, 2012; see also Conway & Wilson, 2012; Gibson, 2012; Lang, 2012).

Throughout history, a state's principal responsibility and commitment has always included its preoccupation with securing access to food for its population (Keyzer & van Wesenbeeck, 2012); even though recent trends in the 21st century show that the state is losing much of its grip on the food system to private enterprises (Grant, 2012). Food policy research has a pivotal role to play in understanding the political economy of food and illuminating the state's strategies to achieve food security. Given that the exact meaning of policies are not self-evident (Steinberger, 1980), this paper examines the extent to which agricultural government discourse reflects smallholder farmers' perceptions and facilitates agency and articulates strategies to achieve food security.

This kind of reflexive policy analysis is important to provide policy feedback and it can help to identify a missing discourse which may have implications for achieving national goals. First, this paper begins with an overview of governance and the role of the state in the food system in Jamaica. Secondly, it outlines the significance of the data source and the methodology used for this analysis and finally, the paper discusses the findings and the gaps, within the policy discourse, that have implications for smallholder farmers and food security.

Policy discourse analysis and social construction

Discourse analysis as an effective tool for analyzing text and for understanding context and larger meanings in which these stories and policy constructions are embedded (Dryzek, 2006; Fairclough, 2003; Gasper & Apthorpe, 1996; van Dijk, 2008). According to Pierson (1993) policy feedback research of this nature is important for highlighting the effects of policies on social groups because policies send messages that are absorbed by the citizenry and can influence a group's orientation and participation. However, certain messages directed at a particular target group may not produce the desired outcome because the messages are unclear or poorly designed, resulting in the target population's response being one of withdrawal or passivity (Schneider & Ingram, 1993).

To understand the impact of the policy message for a broad cross-section of people requires expert understanding of local conditions and practical reasoning derived from lived experiences. The policy meanings must be interpreted in the time and place context in which they were generated and used (Yanow, 2000). By focusing on the links between discourse and social practices, policy discourse analysis can show how certain socio-historical and socio-

economic patterns serve to inform specific policy direction and identify pivotal points which privileged some argument over another (Fischer, 2003). This approach to discourse analysis subscribes to Fairclough's view of discourse as social practice, an analytical strategy where discourse can be used in conjunction with other forms of analysis, such as ethnography, to give social meaning to social and physical relationships (Erjavec & Erjavec, 2009; Fairclough, 2003; Fischer, 2003) and identify missing narratives (See Alston, 2009; Robson, 2011; Greenhalgh, 1994).

Critical discourse analysis is one of many versions of discourse analysis put forward by Fairclough and which exists alongside other approaches such as a Foucauldian perspective. It seeks to delve beyond the text and language to examine the power relations that shape discourse (Sharp & Richardson, 2001) and can be employed for a wide range of approaches to analyzing text (Fairclough, 2003). Brissett (2010) concluded that while there are tensions between, critical analysis and Foucauldian approaches to discourse analysis, both perspectives share common interests, such as the aim to determine whose interests are being served when different policies are designed and implemented. The discourse analysis in this paper is concerned with governance, the agenda and activities of the state, and how sovereign power impact the welfare of smallholder farmers (see Lang, Barling & Caraher, 2009). This is not inimical to critical discourse analysis which views discourse in politics as "part of the exercise of and struggle over power" (Fischer, 2003 p. 76).

Agriculture in Jamaica

Agriculture has historically been considered the backbone of the Jamaican economy and the smallholder farmers as the main drivers of food security and the domestic food system (Beckford, 2012; Beckford, Barker & Bailey 2007). However, despite the significance of the sector to the economic development, public sector budgetary allocations and expenditures continue to be inadequate. In Jamaica the average budgetary allocation to the agricultural sector between 2010 and 2013 was 2.3% (Ministry of Finance (MOF), 2013) far below the benchmark necessary for growth and development given the significant contribution agriculture makes to employment and GDP. Scholars have pointed out that developing countries typically apportioned between 6% and 8% of the total budget to agriculture instead of the 10% considered to be the minimum necessary (Arias, 2010; Diouf, 2011, p. ix).

Although in the last decade, the contribution of agriculture to GDP in Jamaica hovers between 5 to 6% it continues to factor significantly as the second largest source of employment (Planning Institute of Jamaica (PIOJ), 2012). Therefore its political importance extends well beyond its impact captured in GDP. Norton (2004) argued that the fundamental goal of agricultural policies should be more than just increasing production and contribution to GDP. Instead, agricultural and food policies must include strategies for economic, social and environmental sustainability and the promotion of new collaborations across sectoral and ministerial boundaries (see also Hadwiger & Hjermstad, 1994; Lang, 2012).

Evidence of entrenched structural dualism, which is a product of the colonial heritage, is manifested in the geography, ecology and agrarian structure. Jamaica's agricultural sector is one in which the traditional, specialized and more organized export crop sector operates on the fertile low-lying lands; while the majority of the smallholder farmers cultivate the marginal hilly areas

of the country. The large-scale farmers who produce for the export are organized and receive most of the attention from policymakers. This has resulted in a longstanding asymmetrical economic and social relationships within the agriculture industry (Beckford, 2012; Beckford & Barker, 2007; Rao, 1990; Smikle, 1996). In this socio-cultural environment small-scaled farming as a profession is viewed as having low status on the occupational hierarchy because it is labor-intensive, considered high risk and leads to a life of subsistence living. Furthermore, negative attitudes towards farming have historical roots that have been carried over into present day society (Ahmed & Afroz 1996; Odie-Ali, 1986; PIOJ, 2012).

Jamaica, like many of the islands in the Caribbean, is a net importer of foodstuffs, so governments have had to strengthen their agricultural policies to mitigate the impact of the recent financial and food crises in the region (ECLAC, 2012). Evidence shows that following a major focusing event, such as a food crisis, most countries often promote food self-sufficiency (Conway & Wilson, 2012). Historically, Jamaica's agricultural policy makers have responded to various crises by implementing policies for self-sufficiency, for instance, following the 1970s oil crisis and devastating hurricanes, such as Gilbert 1988 and Ivan 2004.

When disruptive events impact the food system, agricultural policy approaches promoted the expansion of domestic food production, advocated the increased consumption of locally grown foods as well as placed restrictions on the importation of certain foods in an effort to encourage self-sufficiency. Some of those policies, in the 1970s for example, resulted in increased prices for locally produced food, and that provided incentives for small farmers to produce more crops (Innerarity, 1996). However, since the 2000s, trade liberalization edicts have rendered certain policy approaches ineffective so today cheaper foods, imported into the country, compete with local food crop producers for consumers' dollars. These changes form a part of the

evolution taking place within the Jamaican agricultural sector, hence this paper uses the sectoral discourse to investigate the impact of the changes on smallholder farmers and food security.

Changes in food and agriculture policymaking

In the agricultural policy arena, however, new discourses about food are constantly being generated because of unprecedented changes in global food regimes since the twentieth century. But because government actions tend to lag behind many of the changes within the sector, the ramifications of these changes are only now being worked through at the policy and institutional levels (Grant, 2006; Lang, 2012; Lang, et al., 2009). Some of these new forms of food and agricultural policies are marked by the influence of multi-level governance, whereby production strategies are dictated by a mix of global, regional, supra-national and national regulations and institutions (Halpin, 2005; See also Gibson, 2012; Lang et al., 2009). Andersen and Watson (2011) described the amount of changes taking place in food system as ‘dizzying’ but explained that while food systems must simply transform to meet larger trends, some of the changes require concerted efforts and planning to effectively produce outcomes suitable to local situations. According to Halpin (2005) the attitude of the state towards these globalizing processes is a decisive factor in reframing the relationship between governments and stakeholders in local agricultural sectors.

While crises may bring about sweeping changes in particular policies, there is a tendency that overtime policies may also revert to more familiar policy orientation due to institutionalized frames and path dependency (Howlett & Ramesh, 2003; Perche, 2011; Peters & Pierre, 2006). When policies are left unexamined they become entrenched in institutions. Once they are

embedded in the social consciousness, problem frames can become institutionalized, resistant to change, and become a mechanism for path dependency. This can form obstacles to problem redefinition and the exploration of alternative solutions (Dery, 1984; Frederking, 2012).

Since the 2008 food crisis, debates on food security have fueled the calls for agricultural policies to become more inclusive of alternative paradigms and to challenge the traditional thinking (Brunori & Guarino, 2010). With an ever increasing number of new actors and popular movements entering the food policy arena, the potential for transformation within the sector is quite high. Calls are being made for policymakers to be mindful of salient arguments such as food sovereignty (Wittman, Desmarais & Wiebe, 2010; Beckford & Campbell, 2013), agricultural sustainability (Baldwin, 2009; Raman, 2006), multi-functionality (Almås & Campbell, 2012) and climate change (Huang, Legg & Cattaneo, 2010) when crafting food security policies.

In this paper the text from parliamentary discourse, in Jamaica, is used to gain insights into the relationships between government and smallholder farmers. This government discourse specifies ways of interacting and is a useful resource (Fairclough et al., 2004) that is capable of capturing the attitude put forward by the state. This discursive examination of the governance frames and policy messages locates the smallholder farmers within the text and provides a national level analysis of strategies and programs aimed at curbing food insecurity. It assesses the differential impact of government discourse on smallholder farmers and identifies how they are socially constructed in the text. Food is political (Lang et al., 2009) so the analysis taps into discourse that policymakers deploy in the form of words and images to change behavior and inform meaning-making (Allan 2003; Fairclough, 2003).

Research Design

Discourse analysis is concerned with examining the mechanisms in policy practice that influence “social relationality of power and meanings” (Hajer & Laws, 2006, p. 262). To capture the relational meanings between smallholder farmers and the state, this research used the final drafts of the Minister of Agriculture presentation to Parliament for the Annual Sectoral Budget Debate 2003-10; 2012-13¹ as texts. This decade, which coincided with numerous impactful global and domestic events, formed the contextual backdrop for cogent sectoral policymaking in Jamaica.

Theoretical framework

For conceptual grounding, the theory of social construction was chosen for its argument that the selection of policy tools and policy choices, by decision makers, determines beneficiaries and losers. It further seeks to account for the differentiated levels of participation among target groups by hypothesizing that different target groups may receive differing messages. Therefore certain types of a target populations may not respond by participating as directed by policy change, because the messages received by that particular group might encourage them to withdraw or remain passive (Schneider & Ingram, 1993). Social construction provides a suitable lens through which the analyst can view the extent to which discourse, expressed in language within text, shapes the positions of groups in society and is reflected through policy (Allan, 2003; Edelman, 1977; Kikooma, 2010; See also Barnes & Duncan 1992). This allows for social constructionist approaches to be successfully employed by discourse analysis (Denzin & Lincoln, 2000; see also Gubrium & Holstein, 2000).

¹ No sectoral debates were held in Parliament 2011-12 so no text was available for analysis in that year.

To further improve the practical relevance of this study to policymaking, this analysis incorporates ethnographic knowledge of the smallholder farming community. Empirical data from in-depth interviews provided the socio-cultural perspectives for the interpretation of the discourse. The incorporation of such evidence facilitated an analysis of how the discourse, or changes in the discourse, figured practically in the lives of smallholder farmers (see Fairclough, 2003; Sharp & Richardson, 2001). In this longitudinal study evidence of continuity and change in agricultural policy discourse were identified. The impact of these policies on different groups of smallholder farmers was noted to understand the responses of the target population. Based on the farmer typology developed in chapter 2, the discourse will be filtered through the lens of these sub-populations that exist in the agricultural sector

Research Context

The Parliamentary presentations were chosen because they are a credible source of information for a longitudinal study. Additionally, they represent an account of how funds for sectoral public spending, which often comes from the national budget, are allocated. These government documents play a pivotal role in the fulfillment of economic, political, social, legal and administrative processes (Norton & Elson, 2002). One responsibility of the Minister of Agriculture is to outline to Parliament plans for the use of funds allocated to the sector (see Bayley, 2004; Hallerberg & Marier, 2004). Therefore, decisions on agricultural spending influence critical policy choices which in turn affect food producers and food security in general (Cuesta, Edmeades & Madrigal, 2013). For these reasons parliamentary discourse cannot be treated as recondite information but rather should be viewed as an important repository of policy information.

The study of discourse must include an understanding of text/talk-in-context, which is an examination of the relationship of the discourse to the social context in which it is constructed (Allan, 2003; Gasper & Aphorpe, 1996; van Dijk, 2008). As noted above, the text used in this paper was generated for parliament. According to Bayley (2004) Parliaments are institutions dedicated to talk. It is the venue where government and opposition go ‘on the record’, where policies are justified and or criticized and where plans and proposals are articulated (p. 9). It is true that policy choices made by a country’s political leadership play a key role in the development process (Perkins, Shirley & Wint, 2008), therefore examining what the politicians say can provide an insight into relationships, attitudes and food security related strategies and outcomes.

In the text the Minister addresses the Speaker of the House throughout the speeches as part of formal political language of institutionalized parliamentary proceedings (see Constant, 2003; Hallerberg & Marier, 2004; Lijphart, 1999; Norton & Elson, 2002 for a discussion on parliamentary democratic government). Jamaica’s sectoral budget presentations are generally communicated to the population via live radio and television broadcasts, followed by additional coverage in the print media. In the annual presentations, the strategies, programs, and policy interventions employed by the Ministry of Agriculture (MOA) regarding the national food systems are discussed. The language used in these speeches form part of the political arena and carries with it the power to shape meaning, direct political processes and reveal the political roles officials and the general public play” (Edelman, 1977; Mehan, 1997).

Recording the data

Ten texts from speeches, 2003-2013, averaging 9584 words in length, were read and re-read chronologically before QSR NVIVO 10 was used to code the texts at open nodes, based on

themes which emerged from the discourse. Each theme had numerous child nodes which referenced information specific to the theme. Once axial coding was completed, this facilitated the selection of information salient to this study on smallholder food crop producers and food security policy in Jamaica (see Siccama & Penna, 2008; Robson 2011). The data were re-examined and aggregated into nodes with titles relating to, relationship with farmers, smallholder farmers' welfare, capacity development, strategies to address food insecurity, information communication technology (ICT), social capital, and challenges.

An ex post facto validation (Foster, 2009; Krippendorff, 2004) of this discourse analysis was done to increase confidence in the results and to ensure validity and reliability of the data; that is, an assurance that conclusions are not founded in biased observations (Foster, 2009; Potter & Levine-Donnerstein, 1999; Street & Ward, 2012). Because reliability and validity are inextricably intertwined (Potter & Levine-Donnerstein, 1999), two analysts were considered sufficient for assessing the reproducibility of data (see Foster, 2009). Multiple perspectives and practical interpretations from the interviews with smallholder farmers formed the basis for the analysis (see Street & Ward, 2012). The second analyst was given all ten budget presentations and asked to identify whether different groups of smallholder farmers were represented in the discourse with regards to ICT use and development, capacity development and food security strategies. The analyst was also asked to note how smallholder farmers were socially constructed; highlight dominant frames and spot pertinent food security policy information that was absent from the text. The analyst found a high degree of convergence with the researcher's analysis. When the facts and interpretations from different sources converge then the data is seen as more trustworthy (Street & Ward, 2012).

Results and Discussion

The results of the dominant problem frames, social constructions, governmental responses and missing discourse that characterized the agricultural policy narrative in Jamaica are summarized below. The Minister of Agriculture in the annual budgetary presentation to Parliament generally addresses many different topics. The textual analysis revealed that from 2003 to 2013 the presentations included themes such as;

- i. the rise of non-traditional export crops, such as yams and ackee
- ii. the decline of the traditional export crops such as bananas and sugar cane
- iii. increasing crop production as an import substitution approach toward self-sufficiency,
- iv. loss of crop to natural disasters (floods, droughts and hurricanes)
- v. social construction of smallholder farmers as powerless and passive in their role as stakeholders
- vi. a Ministry of Agriculture with limited options and tentative about local fixes because of overwhelming changes in the international arena
- vii. limited references to collaborations with other ministries, except tourism
- viii. an agenda that harkens back to previous decades with scant mention of women, mitigation strategies to address climate change and plans to improve ICT access and adoption.

More specifically, during the decade 2003- 2013 smallholder farmers in Jamaica were addressed by the MOA as a homogeneous group and as a group they were often hailed for their resilience and perseverance in the field, as the Minister noted in his 2008-09 presentation:

This Government salutes the Jamaican farmers Mr. Speaker, who despite the odds, have overcome hurricanes and droughts, crop and animal diseases, limited extension services,

as well as unfair trade practices, but still provide for themselves and their families and for the rest of us -- uptown and downtown (MOA, 2008-09 p.2).

These are sentiments the participants in the study would consider fair because they experience similar challenges and are proud of their abilities to provide for their families. On the one hand, messages of gratitude for farmers' long-suffering and tenacity emanate from the MOA, but at other times the message can be harsh and unflattering. This reference in the text describes the perception of traditional food crop small farmers and their activities:

These farmers are largely unsophisticated in their production methodologies and typically over 50 years of age, predominantly growing tubers, condiments and vegetables. These farms are usually un-mechanizable and depend largely on rainfall. Mr. Speaker, while we salute the efforts of these farmers, while we commend their resilience, and while they have fed us for centuries, the scope for expanded production from this sub-sector is limited. The production in the domestic food crop sector is orientated to feeding ourselves.

Further growth in this sector can only be sustained if we switch the direction to exports and significant import substitution....The policy of this Government therefore, is to pursue a deliberate export strategy. However, in this effort the Government has a clear role, as is the private sector... (MOA 2012-13 p.2)

The view of farmers as a homogeneous group results in this socially constructed image of farmers as static individuals, incapable of achieving much more than they already have achieved and as such are overlooked for some development programs. These opposing frames of the farmers' work and contribution to national food security present mixed messages and appeared as policymakers' justification for decisions, by explaining that the limited capacities of small farmers do not make them viable for inclusion in policymakers' plans.

The smallholder farmers were perceived as having limited capacities and were viewed as a burden to sectoral change. This was expressed undisguised in discourse as;

In the main, the typical farmer is aging, averaging 55 years, with no formal training in agriculture or otherwise, occupying two to five acres of land, but having no registered title. According to official statistics, he or she represents over 200,000 members or

18% of the country's workforce. For the most part, that farmer does not have the opportunity to re-tool or to get training.

He/she does not understand the WTO or the EPA, but he/she must confront the consequences of trade policies that result in increasing competition, and increasing marginalisation (MOA 2008-09, p.3).

The portrayal of smallholder farmers' as resource poor and 'clueless' about international affairs presents a clear challenge for policymakers whose approaches to agricultural development were top-down and export driven and not concerned with capacity development for local stakeholders.

Starting in 2009 the narrative on policy interventions moved further away from targeting smallholder farmers to more specific mention, in the text, of medium and large farmers, as investors. This kind of discourse overlooked segments of the smallholder farming sub-population with limited resources. The text revealed that from 2003 to 2008, there were 10 references to initiatives directly targeting smallholder farmers at the community level. But the 2009 presentation to Parliament represented a change in the discourse. The statement below hinted at a change in focus:

Mr. Speaker, we are a country of small farmers, with 76% of our 220,000 farmers cultivating on 1 hectare (2.5 acres) of land or less. Only 140 farmers cultivate on 200 hectares or more (495 acres)... We must find ways to support our small farmers, but we must also encourage medium to large scale farms if agriculture is to be sustainable (MOA 2009-10, p.15).

The following section explains further how the discourse changed from pro-smallholder farmer development to emphasis on medium and large scale investments, public-private partnerships and reduced state support for some categories of the smallholder farming sub-group.

Agriculture as a business

The representation of 'agriculture as a business' was used 15 times in the text, from 2003 to 2009. This analogy served as a filter to direct the message from the ministry to those farmers

with the resources and the information needed to access the initiatives associated with particular policy thrust. Evidence from participants in this study showed that the majority of smallholder farmers do not participate in food crop production solely on the motivation of making a profit. In the last five years, the findings showed that the language of the policymakers has evolved to refer to ‘the farmer/investor’ or the ‘investor/farmer’ in reference to new agricultural initiatives.

This use of the analogy ‘agriculture as a business’ and pairing the words ‘farmer/investor’ in the discourse became a way of preparing smallholder farmers to take on the responsibility and risk for a future agricultural sector in which the state will have relinquished much of its control. In the text it was articulated as follows:

The transformation of the sector requires new bold thinking, renewed energy and commitment and a shift in orientation from subsistence agriculture and mendicancy to an approach that regards **agriculture as a business**. There is no question that the ministry will play a lead role in this transformation...there is no reason why our farmers should remain marginal and at the mercy of the State. Our mission is to empower people to make money (MOA 2007-08, p. 44).

The state in reducing its role in the sector will allow the private sector to participate in production and marketing rather while it acts as facilitator in a supportive role providing public goods and policies. But, the discourse failed to identify strategies for smallholder farmers whose motivational orientations vary and those who lack the resources to improve beyond the level of subsistence farming. The plans to improve the agency of those farmers were missing from the discourse.

According to the discourse, strategies for agricultural growth and development were pursued despite knowledge of glaring challenges facing the majority of smallholders. Therefore, the MOA’s strategy to focus on more entrepreneurial actors was also introduced under the guise of providing a progressive image for the sector. The Minister of Agriculture outlined the immediacy of this plan in 2003:

We therefore, have a pressing responsibility not only to increase the involvement of more **commercially-oriented farmers**, but also more importantly, *to radically change the culture that says that you can go into farming if you can't do anything else*. We have to understand and put into practice the all-important fact that **farming is a business** not just for large farmers, but also for the smaller ones

In undertaking this business activity, the farmer must make a profit (unless he is involved for his health) so that he can improve the livelihood of his family and community and that of the sector as a whole can make the kind of contribution to the economy, which it has the potential to do (MOA 2003-04 p. 6-7).

The 'agriculture as a business' approach to agricultural policymaking in Jamaica is only applicable to a minority of farmers in the study area. In this respect, the administration's policy initiatives have overlooked the motivational orientation and the capacity of the majority of smallholder farmers.

The predicament for policymakers, who have acknowledged the importance of smallholder farming to agriculture and the stability of the country's economy, is whether to concentrate on improving the lot of smallholder farmers or encourage the development of farmers operating larger plots of lands has been considered by the World Bank's as a major policy dilemma. According to the World Bank (2007), food security decision makers in developing countries have to make a determination about where to create the balance. The World Bank insisted that that balance must be struck between addressing food insecurity directly, that is, supporting local production by focusing on subsistence farming through resilient farming systems and safety nets; or by delivering food security through cheaper food bought with the proceeds from export earnings by targeting the more entrepreneurial actors and favored areas that can secure growth and better employment opportunities. The text, from the decade-long Parliamentary presentations, showed that Jamaica is a consistent net importer of food, having total food import bill USD 479 million in 2002 to USD 959 million in 2012 (MOA 2008, p.16 & MOA, 2013, p. 4 respectively). This is emblematic of an administration whose strategy for food

security is one which favors food imports in the back-stopping role of providing food for domestic consumers at the expense of smallholder farmers; while it also seeks to encourage the involvement of larger export-oriented farmers.

The MOA's export-oriented productivist approach, with emphasis on medium to large farms specializing in the production of certain crops, is somewhat reminiscent of the agricultural system strategies inherited from the colonial era. Until recently, sugarcane and bananas were grown on medium and large farms for sale to the export market and the production and distribution of those crops dominated the policy discourse. The continuation of this historical frame for agricultural development is responsible, in part, for the vacillation in government strategies toward smallholder farmers' within the sector.

Continuity or change

Faced with these and other policy dilemmas, policymakers in Jamaica have employed a variety of different policy tools with varying impact on the smallholder farmers' population. In the aftermath of the 2008 world food crisis, the MOA and agricultural organizations heightened their campaigns for food self-sufficiency with the slogan 'grow what you eat; eat what you grow'. However, while pursuing import substitution strategies, in the following statement the administration was forced to admit the potentially limited success of such strategies:

Mr. Speaker, it is important for us to understand that not all foods imported can be produced locally and so any attempt to reduce imports must be placed in the context of what can be replaced. We conducted a study in conjunction with the Customs Department to examine the food import receipts to determine what categories of food and their value can in fact be replaced. The results indicate that last year, Mr. Speaker, approximately \$J23.5B or US\$261M of our imported foods could be directly replaced, representing just over 33% of our imports. Mr. Speaker, the truth is, we could decide to avoid or substitute some of our imports which could bring this figure down.

However, in terms of direct replacement only 33 percent of what we currently import can in fact be replaced in this manner (MOA, 2010-11, p. 3).

Notwithstanding this acknowledgement, the MOA held fast to the promotion of import substitution strategies as a consistent way of improving food security in Jamaica. The abilities of smallholder farmers to meet increased market demands remain questionable without substantial interventions to improve small farmers' capacities to provide the staples for local consumption. The MOA missed an opportunity to link this strategy with the activities of smallholder farmers and instead skewed food security efforts toward export crop production. Endorsements which should have been used to frame smallholder farmers' initiatives in the policy discourse were used in favor of medium and large scale farmers. In 2008-09, for example, the message to farmers to target the potential growth areas of greenhouse production and agro-processing export markets, were all undertakings that resource-poor smallholder farmers were unable to participate in consistently.

Smallholder farmers' agency and welfare

The text revealed that the government attributed the changes to new marketing arrangements and pressures from international organizations such as the World Trade Organization (WTO) when accounting for the transformations taking place within the agricultural sector. The Minister of Agriculture explained that local policy reform was necessary because of a disappearing domestic market:

Mr. Speaker, it is impossible in this day and age to attempt to develop agriculture without reference to the international environment...with the increasing inclusion of agriculture in international trade negotiations, with a trend to liberalization, there is no longer any such thing as a domestic market (MOA 2007-08, p.4).

While it is important to be mindful of the influences of the wider policy environment and the impact international organizations and events have on national policy decisions, Grant (2012) warned that some policymakers run the risk of overstating the impact on some local decisions. For instance in the statement above, by proclaiming the demise of the domestic market, which is generally a niche for smallholder farmers, the MOA has effectively sidelined those farmers and their livelihoods. Grant explained that in arguing that it no longer makes sense to speak of a national food system it is possible that policymakers will overlook unique national differences and consumer tastes, and that as a consequence, the resulting policies all too often, favor agribusiness over smallholder farmers.

The MOA viewed the increasing role of non-state international actors in agricultural policymaking as a major contributor to institutional changes within the local sector. This perspective constituted another dominant frame within the discourse that has guided policymakers' attitude towards traditional food crop producers and, implicitly accounted for the focus of policies. The Minister articulated it this way:

The developments taking place in the international trade arena dictates (sic) Mr. Speaker that we restructure our agricultural sector so that it can achieve the level of competitiveness required for the success in the global marketplace. In this regard Mr. Speaker it is vital that all the stakeholders in the sector and indeed the nation as large recognize that a completely new paradigm of development is required and as tempting as it might be to look backward to pre-liberalization days, such a return is just not going to happen. Indeed if it were possible it would be completely inimical to the future of the sector and to livelihood of our farmers.

The new paradigm requires Mr. Speaker, that we go forward; that we change the way we do business; that we learn new skills and that we retool ourselves and the industries with which we are involved. In plain words, Mr. Speaker we must become more efficient and businesslike. (MOA 2003-04, p.41).

However, references to a capacity development approach, which would foster smallholder farmers' agency, did not match the level of restructuring taking place in the policy

arena, given all the magnitude of the institutional and structural reforms taking place in the agricultural sector. For instance in 2012-13 J\$ 42 million (USD 470 thousands)² was allocated to RADA to train farmers in water management, production techniques and marketing. This amount was up from J\$ 15 million (USD 259 thousands)³ allocated for crop production, extension service and rural development in 2003-04.

Group Development

Top-down messages encouraging smallholder farmers to organize and form groups in order to improve their productive capacities and take advantage of other efficiencies have been put forward by the MOA. However, in the discourse these interventions were often articulated vacuously and would fail to address obstacles to group development. The MOA acknowledged major problems with groups in the agricultural sector but failed to as state how group development could be enhanced through policy initiatives. In Parliament the Minister mentioned:

I am conscious that the level of organization and capacity in the various farmer associations, is less than what is required to move the sector forward. Mr. Speaker, the vision of this government is to foster the development of strong farmer associations and cooperatives to increase their control of every facet of the process from production through processing, distribution and marketing. We will only be able to make a critical difference in marketing, procurement and distribution when groups of farmers come together to undertake these services for themselves (MOA 2007-08 p.42).

The discourse neglected to provide policy initiatives that would facilitate the group development process and assist the smallholder farmers to achieve agency. Agency speaks to the capacity of the farmers to take effective action for self-determination (see Murphy, 2012), which can be

² Calculated at historical foreign exchange rate (J\$ 89: USD)
http://www.boj.org.jm/foreign_exchange/fx_historical_rates.php

³ Calculated at historical foreign exchange rate J\$ 58: USD
http://www.boj.org.jm/foreign_exchange/fx_historical_rates.php

done if an enabling environment is provided for these farmers. For instance, evidence of plans to improve sectoral information transfers, use of information and communication technologies (ICTs) and capacity building for farmers was rare. These plans could be incorporated in training and group development strategies to enhance social capital and to enable farmers to build useful networks. By engaging in bottom-up planning and harnessing of social capital policymakers could improve the capacity of farmer groups and associations.

The discourse indicated that extension officers were equipped with ICT tools and capabilities but in the decade-long discourse only a single specific ICT tool, for direct use by smallholder farmers, was introduced. A database for agricultural marketing information was touted by the MOA as a solution to the marketing challenges facing consumers and producers. It was designed to address problems associated with food access, food availability and pricing. According to the discourse work on the database started in the 2005; however, from the outset, the discourse constructed the farmers as passive participants who just needed to comply with the requests for data:

The process of identifying markets both local and export, coordinating the production and linking buyer and producer, is the purpose for which the Agri-business Information system (ABIS) was set up within RADA.... *At this stage, I can only ask that our farmers cooperate and provide the information that is necessary if the system is to perform effectively and importantly to their advantage* (MOA 2005-06 p. 20)

Unfortunately, the outcome of this informational initiative is one that smallholder farmers, in this study, are primarily unable to take advantage of because they lack computers, Internet access and, or computer skills. Today, the smallholder farmers are not the primary beneficiaries of the new marketing system the Minister commissioned in 2013:

Mr. Speaker, in recent years we have spent considerable sums, thanks to the USAID, to create the Jamaica Agricultural Marketing Information System, JAMIS, which on a

weekly basis supply to hotels and other end users the prices, quantities and location of a range of agricultural produce (MOA 2012-13, p.12).

Absent from the discourse on the market information system were considerations for improving the requisite practical skills and infrastructure necessary for smallholder farmers to access and use the system. This technologically deterministic approach represents a lack of informed decision making on the part of the policymakers and one that is incongruent with the smallholder farmers' needs and capabilities. The system will be underutilized by smallholder farmers in this study and others like them across the island. This means that the benefits of a potentially useful tool, which could bring about improvements in food access and food availability in the local food system, will likely be reduced.

Missing Discourse

Successive government administrations have failed to establish a clear and consistent long term plan for addressing issues pertinent to the development of smallholder farmers and food insecurity in Jamaica. The results in the discourse showed that MOA's policy strategies change in response to factors such as natural disasters and food crises. As a consequence of this reactive stance, coordinated strategies for new challenges are missing from the discourse. The table summarizes the differential resource capacities of smallholder farmers and highlights pertinent issues missing from the policy discourse.

Table 4.1: Missing discourses and messages for smallholder farmers' in agricultural discourse

Messages of government discourse	Responses of smallholder farmers				Missing Discourse
	Sustainers	Go-getters	Stalwarts	Entrepreneurs	
Productionism – increase local production Export more food crops	Resource poor and passive	Engage cautiously afraid of market failures	Unaffected Maintain production levels	Take advantage of policy initiatives	Multi-functionality Improved planting material for traditional food crops High cost of input Crop insurance
Self-sufficiency – eat what you grow; grow what you eat	Active participant	Active participant	Active participant with some opportunities to supply export market	Earn foreign exchange and participate in domestic market	Education campaign on the food security triad; Design multi-sector strategies and policies; carbon footprint and food miles; Health; Role of women
Agriculture as a Business – modernize farms; use technology;	Passive Resource-poor	Inspired but face resource constraints	Indifferent	Motivational orientation – enthusiastic about appropriate innovations	Improving market infrastructure and Access to ICT system Agricultural multi-functionality Food justice
Forces beyond direct control: devastating weather events	Highly vulnerable	Manages to stay afloat until recovery efforts produce results	Unable to achieve pre-disaster levels quickly	Rebounds quickly	Mitigating the impact of climate change; Insurance for producers

The agenda for agricultural policies has to be widened to include, among other things, strategies for mitigating the effects of climate change, the use of ICT for agricultural information and providing the policy environment for agricultural benefits to be derived from more than just food production. Additionally, greater collaborations with other ministries of government, such as health, education, environment, tourism, industry and commerce is needed to foster synergies, provide opportunities for smallholder farmers and catalyzed growth and development.

Conclusion

The discourse constructs the smallholder farmers as affable and hard-working custodians of domestic food production but they are also seen as passive and static in their role as stakeholders in the local food systems. Smallholder farmers were found to have a weak voice with limited avenues to influence policy. Initiatives for the development of their human agency and capacity building were done through top-down approaches and considerations for heterogeneity among smallholder farmers did not appear to be a priority for decision makers in the agricultural policy arena.

Policymakers at the national level have restructured the state's responsibilities toward smallholder farmers within the context of a globalizing economy, following the rise of a neoliberal ideology, which favors limiting state interventions and promotes the hegemony of market forces (see Glenna, 2003). This discursive analysis showed that the agricultural policy initiatives of the Jamaican government are changing to promote strategies which do not directly address smallholder farmers' needs. The discourse lacks the provision of a promising strategy to achieve pro-poor growth and sustainable traditional food crop agriculture among smallholder

farmers with different motives for participating in the local food systems. Government support is needed to provide targeted capacity building initiatives, infrastructure and other public goods. The discursive agenda needs to be broadened to facilitate closer collaboration with other ministries and the inclusion of other current issues affecting food security in the country. Two recent documents, the tabling of a Ministry white paper for the food and nutrition security policy (Government of Jamaica (GoJ), 2013) and Ministry of Agriculture and Fisheries' Business plan 2014-2017 (MOAF, 2014) have attempted to address a few of these deficiencies in the policy discourse.

The agricultural and food security policy discourse in Jamaica is like a palimpsest. It maintains elements of past policies regardless of the dramatic changes taking place elsewhere in the policy arena. While smallholder farmers are hailed as the unsung heroes of the traditional food crop sector, they are not being supported fully by policy initiatives which can transform their livelihoods and improve food security. Emerging frames in the discourse that promote an image of agriculture as a business is unattainable for most smallholder farmers in this research because they lack the motivation, infrastructure, skill set and resources to act accordingly. As a consequence, segments of the smallholder sub-population will remain isolated within the sector if they are left unattended. Unless policymakers take deliberate action to incorporate a broad set of issues and target the performance of all segments of the food producing system, there will not be adequate food to meet local demand and ward off the problems associated with food insecurity.

REFERENCES

- Ahmed, B. & Afroz, S. (1996). *The political economy of food and agriculture in the Caribbean*. Kingston, Jamaica: Ian Randle publishers.
- Allan, E. (2003). Constructing Women's Status: Policy Discourses of University Women's Commission Reports. *Harvard Educational Review* 73(1), 44 – 72.
- Almås, R. & Campbell, H. (2012). *Rethinking agricultural policy regimes: Food security, climate change and the future resilience of global agriculture*. Bingley, UK: Emerald group publishing limited.
- Alston, M. (2009). Drought policy in Australia: Gender mainstreaming or gender blindness? *Gender, place and culture* 16(2), 139 - 154.
- Apthorpe, R. (1984). Agriculture and strategies: The language of development policy. In, E.J. Clay & B.B. Schaffer (eds.) *Room to manoeuvre: an exploration of public policy planning in agricultural and rural development* (pp. 127- 141). Cranbury, NJ: Associated University Presses.
- Baldwin, C. J. (2009). *Sustainability in the food industry*. Ames, Iowa: Wiley-Blackwell and the Institute of Food Technologies.
- Barnes, T. J. & Duncan, J. S. (1992). Introduction: Writing worlds. In, T. Barnes & J. Duncan (eds.) *Writing worlds: Discourse, text and metaphor in the representation of landscape* (pp. 1-17). London, England: Routledge.
- Bayley, P. (2004). Introduction: The whys and wherefores of analyzing parliamentary discourse. In, P. Bayley (Ed.) *Cross-cultural perspectives on parliamentary discourse* (pp. 1 – 44). Philadelphia, USA: John Benjamins Publishing Company.
- Beckford, C., Barker, D. & Bailey, S. (2007). Adaptation, innovation and domestic food production in Jamaica: Some examples of survival strategies of small-scale farmers. *Singapore Journal of Tropical Geography* 28, 273 -286.
- Beckford, C. (2012). *Issues in Caribbean Food Security: Building Capacity in Local Food Production Systems, Food Production - Approaches, Challenges and Tasks*, Prof. Anna Aladjadjiyan (Ed.), Available from: <http://www.intechopen.com/books/food-production-approacheschallenges-and-tasks/issues-in-caribbean-food-security-building-capacity-in-local-food-production-systems>.
- Beckford, C. & Campbell, D. (2013). *Domestic Food Production and Food Security in the Caribbean: Building Capacity and Strengthening Local Food Production Systems*. Gordonsville, VA: Palgrave Macmillan.
- Birner, R. & Resnick, D. (2010). The political economy of smallholder agriculture. *World Development*, 38(10), 1442–1452.

- Brissett, N. (2010). Jamaica's policy discourse in the age of globalization: Framing education as (Private) investment. *The global south* 4(2), 197 – 217.
- Brunori, G. & Guarino, A. (2010). Security for whom? Changing discourse on food in Europe in times of a global food crisis. In, G. Lawrence, K. Lyons & T. Wallington (eds.) *Food security nutrition and sustainability* (pp. 41-60). London, UK: Earthscan.
- Constant, F. (2003). Is there a new political culture in the Caribbean? Challenges and opportunities. In, H. Henke & F. Reno *Modern political culture in the Caribbean* (pp. 3 – 20). Kingston, Jamaica: University of the West Indies Press.
- Conway, G., & Wilson, K. (2012). *One billion hungry: Can we feed the world?* Ithaca, N.Y: Comstock Pub. Associates.
- Cuesta, J., Edmeades, S. & Madrigal, L. (2013). Food security and public agricultural spending in Bolivia: Putting money where your mouth is? *Food Policy*, 40(1), 1-13.
- Daugbjerg, C. & Swinbank, A. (2012). An introduction to the 'new' politics of agriculture and food. *Policy and society* 31(40), 259-270.
- Denzin, N. & Lincoln, Y. S. (2000). Strategies of inquiry. In, N. Norman & Y. Lincoln (eds.) *Handbook of qualitative research*, (pp. 367 - 379). Thousand Oaks, CA: Sage publications Inc.
- Dery, D. (1984). *Problem definition in policy analysis*. Lawrence, Kansas: University press of Kansas.
- Diouf, J. (2011). Foreword. *FAO in the 21st century: Ensuring food security in a changing world*. Rome, Italy: Food and Agriculture organization of the United Nations (FAO).
- Dryzek, J. (2006). Policy analysis as critique. In, M. Moran, M. Rein & R.E. Goodin (eds.) *The Oxford handbook of public policy* (pp. 190-203). Oxford, New York: Oxford University Press Inc.
- Economic Commission of Latin America and the Caribbean. (ECLAC)(2012). - (Food and Agriculture Organization (FAO) - Inter-American Institute for Cooperation on Agriculture (IICA). (2011). The outlook for agriculture and rural development in the Americas: A perspective on Latin America and the Caribbean 2011-2012. Retrieved from http://www.eclac.org/publicaciones/xml/6/44826/Perspectivas_agricultura2011_ingles-web.pdf
- Edelman, M. (1977). *Political Language: Words that Succeed and Policies that Fail*. London: Academic Press Inc.
- Erjavec, K. & Erjavec, E. (2009). Changing EU agricultural policy discourse? The discourse analysis of the Commissioner's speeches 2000-2007. *Food policy*, 34(2), 218-226.

- Fairclough, N. (2003). *Analysing discourse: Textual analysis for social research*. New York, NY: Routledge.
- Fairclough, N., Graham, P., Lemke, J. & Wodak, R. (2004). Introduction. *Critical Discourse Studies* 1(1), 1 – 6.
- Fischer, F. (2003). *Reframing public policy: Discursive politics and deliberative practices*. Oxford, UK: Oxford university press.
- Foster, J. (2009). Understanding interaction in information seeking and use as a discourse: A dialogic approach. *Journal of Documentation*, 65(1), 83-105.
- Frederking, L. (2012). A comparative study of framing immigration policy after 11 September 2001. *Policy studies*, 33(4), 283-296.
- Gaspar, D., & Apthorpe, R. (1996). Introduction: Discourse Analysis and Policy Discourse. *European Journal of development research* 8(1), 1-16.
- Glenna, Leland. (2003) Farm crisis or agricultural system crisis? Defining national problems in a global economy. *International Journal of sociology of Agriculture and food*. 11, 15-30.
- Government of Jamaica (GoJ). (2013) Ministry Paper – Cabinet decision #17/13. Retrieved from, http://www.japarliament.gov.jm/attachments/898_Ministry%20Paper%2040-2013%20%28The%20Food%20and%20Nutrition%20Security%20Policy%29.pdf
- Grant, W. (1995). Is agricultural policy still exceptional? *The Political Quarterly*, 66(3), 156-169.
- Grant, W. (2012). Can political science contribute to agricultural policy? *Policy and Society* 31(4), 271-279.
- Greenhalgh, S. (1994). Planned births, unplanned persons: “Population” in the making of Chinese modernity. *American ethnologist* 30(2), 196-215.
- Gubrium, J. & Holstein, J. (2000). Analyzing interpretive practice. In, N. Norman & Y. Lincoln (eds.) *Handbook of qualitative research*, (pp. 487 – 508). Thousand Oaks, CA: Sage Publications Inc.
- Hadwiger, D. & Hjermsstad, W. (1994). Agricultural policy. In, S. Nagel (ed.) *Encyclopedia of policy studies* (pp. 507 -521). New York, NY: Marcel Dekker, Inc.
- Hallerberg, M. & Marier, P. (2004). Executive authority, the personal vote and budget discipline in Latin American and Caribbean countries. *American journal of political science* 48(3), 571- 587.

- Hajer, M. & Laws, D. (2006) Ordering through discourse, In M. Moran, M. Rein & R. Goodin (Eds.) *The Oxford handbook of Public policy* (pp. 251- 268). New York, NY: Oxford University Press Inc.
- Halpin, D. (2005). Agricultural interest groups and global challenges: Decline and resilience. In, D. Halpin (ed.) *Surviving global change: Agricultural interest groups in comparative perspective* (pp. 1- 28). Hampshire, England: Ashgate Publishing Limited.
- Howlett, M. & Ramesh, M. (2003). *Studying Public Policy: Policy Cycles and Policy Subsystems*. Canada: Oxford University Press.
- Huang, H., Legg, W. & Cattaneo, A. (2010). Climate Change and Agriculture: The Policy Challenge for the 21st Century? *EuroChoices*, 9(30), 9–15. doi: 10.1111/j.1746-692X.2010.00174.x
- Innerarity, F. (1996). *Program for the Analysis of agricultural policies vis-à-vis women food producers in the Andean, the Southern Cone and the Caribbean: Women Producers in in Jamaica: Assessment and policies*. Inter-American institute for the Cooperation on Agriculture (IICA). Retrieved from http://0-books.google.com.library.uark.edu/books?id=UOAqAAAAYAAJ&dq=women+food+producers+in+Jamaica&lr=&source=gbs_navlinks_s.
- Keyzer, M. & van Wesenbeeck, L. (2012). Food security management, aid and governance. . In, N. Pouw & I. Baud (eds.) *Local governance and poverty in developing nations* (pp. 73-95). New York, NY: Routledge.
- Kikooma, J. (2010). Using qualitative data analysis software in a social constructionist study of entrepreneurship. *Qualitative research journal* 10(1), 40-51.
- Krippendorff, K. (2004), *Content Analysis: An Introduction to its Methodology*. London: Sage publications Inc.
- Lang, T. (2012). Food industrialization and food power: Implications for food governance. In, P. Williams-Forson & C. Counihan (eds.), *Taking food public: Redefining foodways in a changing world*, (pp. 11-22). New York, NY: Routledge- Taylor & Francis.
- Lang, T., Barling, D. & Caraher, M. (2009). *Food policy: Integrating health, environment and society*. New York, NY: Oxford University Press.
- Lijphart, A. (1999). *Patterns of democracy: Government forms and performances in thirty-six countries*. New Haven, USA: Yale University Press.
- Mehan, H. (1997). The discourse of the illegal immigration debate: a case study in the politics of representation. *Discourse and Society: An International Journal for the Study of Communication* 8(2), 249-270.

- Ministry of Agriculture (MOA). (2003). Budget presentation 2003-04. (MOA Publication). Kingston, Jamaica: Hon. Roger Clarke.
- Ministry of Agriculture (MOA). (2004). Budget presentation 2004-05. (MOA Publication). Kingston, Jamaica: Hon. Roger Clarke.
- Ministry of Agriculture (MOA). (2005). Budget presentation 2005-06. (MOA Publication). Kingston, Jamaica: Hon. Roger Clarke.
- Ministry of Agriculture (MOA). (2006). Budget presentation 2006-07: Together we can make it. (MOA Publication). Kingston, Jamaica: Hon. Roger Clarke.
- Ministry of Agriculture and Lands. (2007). Budget presentation 2007-08: We have the formula. . (MOA Publication). Kingston, Jamaica: Dr. the Hon. Christopher Tufton.
- Ministry of agriculture (MOA). (2008). Budget presentation 2008-09: In the people's interest: Advancing agriculture for sustainability and food security. (MOA Publication). Kingston, Jamaica: Dr. the Hon. Christopher Tufton.
- Ministry of Agriculture and Fisheries. (2009) Budget presentation 2009-10. (MOA Publication). Kingston, Jamaica: Dr. the Hon. Christopher Tufton.
- Ministry of Agriculture and Fisheries. (2010). Budget presentation 2010-11. (MOA Publication). Kingston, Jamaica: Dr. the Hon. Christopher Tufton.
- Ministry of Agriculture and Fisheries. (2012). Budget presentation 2012-13: Positioning agriculture to new heights: Modernization, value added & new industries. (MOA Publication). Kingston, Jamaica: Hon. Roger Clarke.
- Ministry of Agriculture and Fisheries (2013). Budget presentation 2013-14: Grow agriculture grow Jamaica. (MOA Publication). Kingston, Jamaica: Hon. Roger Clarke.
- Ministry of Agriculture and Fisheries (MOAF). (2014). Strategic business plan 2014 – 2017 (March 14). Retrieved from <http://www.moa.gov.jm/AboutUs/MoAF-Strategic-Business-Plan-2014-2017.pdf>
- Murphy, S. (2012). Changing perspectives: Small farmers, markets and globalisation. (Revised edition), IIED/Hivos, London/The Hague. Retrieved from; <http://ictsd.org/downloads/2012/08/changing-perspectives-small-scale-farmers-markets-and-globalisation-murphy-iied.pdf>
- Norton, A. & Elson, D. (2002). What's behind the budget? Politics, rights and accountability in the budget process. Retrieved from <http://www.internationalbudget.org/wp-content/uploads/Whats-Behind-the-Budget-Politics-Rights-and-Accountability-in-the-Budget-Process.pdf>

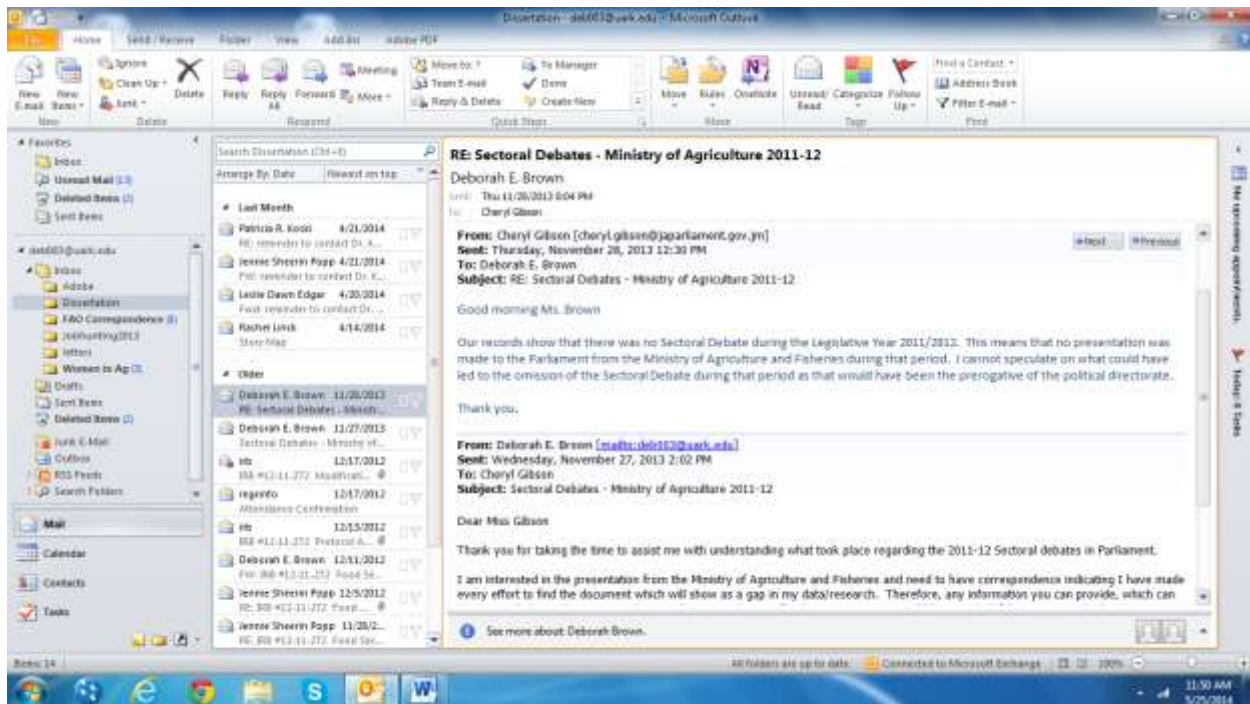
- Norton, R. (2004). *Agricultural development policy: Concepts and experiences*. West Sussex, England: John Wiley & Sons Ltd.
- Odie-Ali, S. (1986). Women in agriculture: The case of Guyana. *Social and Economic studies* 35(2), 241-289.
- Perche, D. (2011). Dialogue between past and present: Policy Evaluation and History. *Australian Journal of Politics and History*, 403-419.
- Peters, G. & Pierre, J. (Eds.). (2006). *Handbook of Public Policy*. Thousand Oaks, California: SAGE Publications Inc.
- Pierson, P. (1993). When effect becomes cause: Policy feedback and political change. *World politics* 45(4), 595-628.
- Pinstrup-Andersen, P. (2000). Food policy research for developing countries: Emerging issues and unfinished business. *Food Policy* 25(2), 125-141.
- Pinstrup-Andersen, P. & Watson II, D. (2011). *Food Policy for developing countries: The role of Government in global, national and local food systems*. Ithaca, New York: Cornell University Press.
- Planning Institute of Jamaica (PIOJ). (2012). *Economic and Social Survey of Jamaica: 2011*. Kingston, Jamaica: Planning Institute of Jamaica.
- Potter, W. & Levine-Donnerstein, D. (1999). Rethinking validity and reliability in content analysis. *Journal of Applied Communication Research*, 27(3), 258-284.
- Raman, S. (2006). *Agricultural sustainability: Principles, processes and prospects*. Binghamton, NY: Food products press.
- Robson, C. (2011). *Real world Research: a resource for users of social research methods in applied settings*. West Sussex, UK: John Wiley & Sons Ltd.
- Schneider, A. & Ingram, H. (1993). Social construction of target populations: Implications for politics and policy. *American political science review* 87(2), 334-346.
- Siccama, C. & Penna, S. (2008). Enhancing validity of a qualitative dissertation research by using NVIVO. *Qualitative research journal* 8(2), 91-103.
- Sharp, L. & Richardson, T. (2001). Reflections on Foucauldian discourse analysis in planning and environmental policy research. *Journal of environmental policy & planning* 3(3), 193-209.
- Smikle, C. (1996). *Program for the Analysis of agricultural policies vis-à-vis women food producers in the Andean, the Southern Cone and the Caribbean: Women Producers in in Jamaica: Technology and marketing*. Inter-American institute for the Cooperation on Agriculture (IICA). Retrieved from <http://0->

[books.google.com.library.uark.edu/books?hl=en&lr=&id=vIOAQAAIAAJ&oi=fnd&pg=IA1&dq=women+food+producers+in+Jamaica&ots=wN8Q6II-08&sig=pP0XUm0NuOabGLddQe8GxoWbsmU#v=onepage&q=women%20food%20producers%20in%20Jamaica&f=false](https://books.google.com/library/uark.edu/books?hl=en&lr=&id=vIOAQAAIAAJ&oi=fnd&pg=IA1&dq=women+food+producers+in+Jamaica&ots=wN8Q6II-08&sig=pP0XUm0NuOabGLddQe8GxoWbsmU#v=onepage&q=women%20food%20producers%20in%20Jamaica&f=false)

- Steinberger, P. (1980). Typologies of public policy: Meaning construction and the policy process. *Social science quarterly* 61(2), 185 – 197.
- Street, C. & Ward, K. (2012). Improving validity and reliability in longitudinal case study timelines. *European journal of information systems* 21, 160-175.
- Van Dijk, T. (2008). *Discourse and context: A sociocognitive approach*. Cambridge, UK: Cambridge University Press.
- Wittman, H., Desmarais, A., & Wiebe, N. (2010). *Food sovereignty: Reconnecting food, nature and community*. Nova Scotia, Canada: Fernwood publishing.
- Yanow, D. (2000). *Conducting interpretive policy analysis*. Qualitative research methods: vol., 47. Thousand Oaks, CA: Sage publications, Inc.

APPENDICIES

Email correspondence with representative (librarian) from the House of Parliament explaining that no sectoral debate took place in Parliament for the financial year 2011-12



Screenshots of codes from text in Ministry of Agriculture's annual budget presentations to Parliament (2003- 2013)

Uploading Budgets - 10/20/13

File Edit View

File Home Create External Table Analyze Query Explore Layout View

Go Refresh

Clean

Properties Edit

Repeat

Cut Copy Paste

Format

Paragraph

Style

Editing

Printing

Sources

Look for: Search in: Internal Find Now Clear Advanced Find

Internals						
Name	Notes	References	Created On	Created By	Modified On	Modified By
MOA Budget 2007-08	23	70	9/21/2013 10:01 AM	DEB	12/11/2013 12:50 PM	DEB
MOA Budget 2008-09	19	43	9/21/2013 10:01 AM	DEB	1/16/2014 12:28 PM	DEB
MOA Budget 2009-10	25	57	9/21/2013 10:01 AM	DEB	1/15/2014 2:04 PM	DEB
MOA Budget 2010-11	27	44	9/21/2013 10:01 AM	DEB	11/10/2013 11:01 PM	DEB
MOA Budget 2011-12	26	54	9/21/2013 10:01 AM	DEB	11/29/2013 8:19 PM	DEB
MOA Budget 2012-13	32	109	9/21/2013 10:01 AM	DEB	12/11/2013 7:48 PM	DEB
MOA Budget 2013-14	32	76	9/21/2013 10:01 AM	DEB	12/13/2013 12:38 PM	DEB
MOA Budget 2014-15	29	96	9/21/2013 10:01 AM	DEB	12/15/2013 10:06 PM	DEB
MOA Budget 2015-16	32	71	9/21/2013 10:01 AM	DEB	12/17/2013 8:48 PM	DEB
MOA Budget 2016-17	26	80	9/21/2013 10:01 AM	DEB	12/26/2013 3:05 PM	DEB

Sources

Screenshots of codes from text in Ministry of Agriculture's annual budget presentations to Parliament (2003- 2013)

Name	Sources	References	Created On	Created By	Modified On	Modified By
Acknowledge weakness	6	28	11/10/2013 10:05 PM	DEB	12/26/2013 9:05 PM	DEB
Ag in society - FRAMING	6	26	12/11/2013 9:36 AM	DEB	12/26/2013 7:56 PM	DEB
Agro processing	6	14	10/15/2013 9:59 PM	DEB	12/19/2013 9:43 PM	DEB
Articulating role of MOA	7	46	11/29/2013 7:32 PM	DEB	12/26/2013 8:41 PM	DEB
Building moral confidence	7	17	11/06/2013 6:36 PM	DEB	12/26/2013 9:06 PM	DEB
CAPICOM	6	11	10/15/2013 9:38 PM	DEB	12/17/2013 8:51 PM	DEB
Collaboration with other Ministries	6	16	10/23/2013 10:23 PM	DEB	12/26/2013 8:03 PM	DEB
Completeness	2	9	10/23/2013 9:24 PM	DEB	12/17/2013 9:06 PM	DEB
Conservation - environment	6	9	10/23/2013 9:53 PM	DEB	12/26/2013 9:02 PM	DEB
Credit for farmers	4	8	11/09/2013 7:40 PM	DEB	12/16/2013 9:02 PM	DEB
Diversify	6	12	10/13/2013 9:21 PM	DEB	12/17/2013 9:08 PM	DEB
Domestic production	5	5	10/23/2013 9:58 PM	DEB	12/26/2013 7:18 PM	DEB
Drought	2	2	11/10/2013 9:22 PM	DEB	4/9/2014 11:11 PM	DEB
Economical language	5	7	11/10/2013 9:38 PM	DEB	12/26/2013 7:53 PM	DEB
Export orientation	5	10	11/10/2013 9:47 PM	DEB	12/26/2013 7:36 PM	DEB
Farmer registration	6	6	11/10/2013 10:28 PM	DEB	12/17/2013 9:19 PM	DEB
Farmer Training	7	3	10/13/2013 9:50 PM	DEB	12/17/2013 9:24 PM	DEB
Feasible	2	2	9/21/2013 11:06 AM	DEB	11/16/2013 10:22 PM	DEB
Food Import	6	9	10/13/2013 9:39 PM	DEB	12/26/2013 7:32 PM	DEB
Food imports vs domestic production	7	18	9/21/2013 11:34 AM	DEB	12/26/2013 7:34 PM	DEB
Food safety	7	10	10/23/2013 9:42 PM	DEB	12/26/2013 8:02 PM	DEB
Hurricanes	4	6	9/21/2013 11:04 AM	DEB	12/15/2013 8:53 PM	DEB
Impact analysis - Est. Juan	7	16	10/23/2013 10:28 PM	DEB	12/26/2013 8:20 PM	DEB
Information technology	2	9	10/23/2013 9:54 PM	DEB	11/29/2013 8:12 PM	DEB
Infrastructure	6	8	10/13/2013 9:28 PM	DEB	12/26/2013 8:23 PM	DEB
International Influence	7	17	11/10/2013 9:29 PM	DEB	12/17/2013 9:44 PM	DEB
International Relations - impact	9	25	10/13/2013 9:38 PM	DEB	12/26/2013 9:01 PM	DEB
Irrigation	5	13	10/13/2013 9:15 PM	DEB	12/26/2013 7:38 PM	DEB
Land-related issues	6	16	10/23/2013 10:14 PM	DEB	12/17/2013 8:47 PM	DEB
Mission strategy	7	46	11/29/2013 8:22 PM	DEB	12/26/2013 9:03 PM	DEB
Public-private partnership	7	13	10/23/2013 9:45 PM	DEB	12/26/2013 8:33 PM	DEB
References to FOOD SECURITY	10	38	9/21/2013 11:15 AM	DEB	11/16/2014 1:36 PM	DEB
Research and Development	6	18	10/13/2013 9:06 PM	DEB	12/26/2013 8:36 PM	DEB
Risks	5	4	10/23/2013 9:24 PM	DEB	12/26/2013 8:23 PM	DEB
Safety net for vulnerable group	6	6	10/13/2013 9:46 PM	DEB	12/26/2013 8:44 PM	DEB
Small Farmers	7	13	10/13/2013 9:47 PM	DEB	12/17/2013 8:18 PM	DEB
Stats and figures	5	8	11/10/2013 9:39 PM	DEB	12/13/2013 9:00 PM	DEB
Targeting sub-populations	9	19	10/13/2013 9:42 PM	DEB	12/26/2013 8:44 PM	DEB

Screenshots of codes from text in Ministry of Agriculture's annual budget presentations to Parliament (2003- 2013)

The screenshot shows a web application interface with a top navigation bar and a left sidebar. The main content area displays a table of nodes. The table has columns for Name, Sources, References, Created On, Created By, Modified On, and Modified By. The nodes are organized into a hierarchical structure with expandable/collapsible icons.

Name	Sources	References	Created On	Created By	Modified On	Modified By
Export orientation	5	10	11/10/2013 9:47 PM	DEB	12/26/2013 7:26 PM	DEB
Farmer registration	5	5	11/10/2013 10:29 PM	DEB	12/17/2013 9:19 PM	DEB
Farmer Training	7	9	10/13/2013 9:50 PM	DEB	12/17/2013 9:24 PM	DEB
Food Import	6	9	10/13/2013 9:39 PM	DEB	12/26/2013 7:32 PM	DEB
Food imports vs domestic production	7	18	9/21/2013 11:24 AM	DEB	12/26/2013 7:34 PM	DEB
Food safety	7	10	10/23/2013 9:42 PM	DEB	12/26/2013 8:52 PM	DEB
Import substitution - Eat /com	7	15	10/23/2013 10:28 PM	DEB	12/26/2013 8:30 PM	DEB
Information technology	2	5	10/23/2013 9:54 PM	DEB	11/29/2013 8:12 PM	DEB
Infrastructure	6	9	10/13/2013 9:28 PM	DEB	12/26/2013 8:23 PM	DEB
Irrigation	9	13	10/13/2013 9:15 PM	DEB	12/26/2013 7:38 PM	DEB
Roads	3	4	10/23/2013 9:24 PM	DEB	12/26/2013 8:23 PM	DEB
International Relations - Impact	9	25	10/13/2013 9:36 PM	DEB	12/26/2013 9:01 PM	DEB
International Influence	7	17	11/10/2013 9:25 PM	DEB	12/17/2013 9:44 PM	DEB
Land-related issues	5	15	10/23/2013 10:14 PM	DEB	12/17/2013 9:47 PM	DEB
Mission strategy	7	36	11/29/2013 6:22 PM	DEB	12/26/2013 9:03 PM	DEB
Public-private partnership	7	10	10/23/2013 9:40 PM	DEB	12/26/2013 8:33 PM	DEB
References to FOOD SECURITY	15	36	9/21/2013 11:18 AM	DEB	1/15/2014 1:36 PM	DEB
Research and Development	8	15	10/13/2013 9:06 PM	DEB	12/26/2013 8:35 PM	DEB
Safety net for vulnerable group	5	5	10/13/2013 9:46 PM	DEB	12/26/2013 8:44 PM	DEB
Small Farmers	7	13	10/13/2013 9:47 PM	DEB	12/17/2013 8:18 PM	DEB
Stats and figures	5	8	11/10/2013 9:39 PM	DEB	12/13/2013 9:00 PM	DEB
Targeting sub-populations	9	19	10/13/2013 9:42 PM	DEB	12/26/2013 8:48 PM	DEB
Technological advancement	6	8	11/10/2013 10:22 PM	DEB	12/17/2013 9:36 PM	DEB
Use of language	6	30	12/11/2013 10:29 AM	DEB	12/26/2013 8:42 PM	DEB
Vision for the future	7	19	11/10/2013 9:31 PM	DEB	12/26/2013 9:05 PM	DEB
Weather problems	1	4	10/13/2013 9:31 PM	DEB	10/13/2013 9:54 PM	DEB
Hurricanes	4	5	8/21/2013 11:04 AM	DEB	12/15/2013 9:53 PM	DEB
Drought	2	2	11/10/2013 9:22 PM	DEB	4/3/2014 11:11 PM	DEB
Floods	2	2	9/21/2013 11:05 AM	DEB	11/10/2013 10:22 PM	DEB
Women	4	5	10/23/2013 9:48 PM	DEB	12/11/2013 11:40 AM	DEB
Youth- targeting	5	12	11/10/2013 10:57 PM	DEB	12/26/2013 8:42 PM	DEB
Youth Development	7	10	10/13/2013 9:54 PM	DEB	12/15/2013 10:00 PM	DEB

CHAPTER 5. DISSERTATION SUMMARY

Conclusion

The essays in this dissertation provided evidence of social, technological and political variables that are often overlooked, but which policymakers can leverage to improve food security policymaking. The aim of deepening the discussions and broadening the view about what impacts food insecurity were important to this study. It is clear that food security is a problem that must be addressed from more than a biophysical or productivist perspective to include issues such as social capital, use of information technologies and governance discourse analyses that must be mainstreamed in policy design.

This research showed that traditional food crop farming remains an important option for people seeking livelihood security. The job facilitates the provision of food and income for smallholder farmers and their families, satisfies the need for work and allows for the continuation of socio-cultural traditions. The motives of smallholder farmers in western Jamaica were a complex mix of social, cultural, economic and health factors. The farmer typology in this study helped us to understand the different motivational orientations of farmers and their responses to ICTs, group participation and agricultural policy initiatives. The analysis of the governance discourse, which guided the agenda and fostered behavioral changes within the sector, supported the conclusion that smallholder farmers are key stakeholders in the food security triad.

There are increasing pressures on the agricultural sector to improve the state of food security in Jamaica. However, there are numerous problems that affect the well-being of smallholder farmers. In Chapter 2, detailed specific environmental, technical, financial and social

obstacles that limit their provisioning. All the participants in this study experienced similar problems, such as the high cost of inputs, loss of crops from natural disasters and praedial larceny. However, the extent to which these challenges affected their activities varied according to the resources the farmer had available and their motives for farming. For example, *entrepreneurs* considered the high cost of inputs as part of the cost of producing quality crops while *sustainers* reported that they used less fertilizer because it was too expensive. The responses to other challenges relating to irrigation, labor and markets also varied and farmers were left to find creative ways to address their issues. In some areas smallholder farmers coalesce into small community farm groups to address the problem, as in the case of the farmers in Trelawny hill country who breed their own donkeys and mules for transportation. These specific heterogeneous characteristics, among the smallholder farmers in the study area, are noteworthy. If they are unaddressed they can present significant barriers to improving food accessibility and food availability but they are also an entry point for intervention to improve smallholder farmers' agency.

There are other technological, institutional and social deficiencies that constitute underlying causes of food insecurity in Jamaica. These findings revealed that a majority of the smallholder farmers had limited knowledge of the Internet and self-efficacy with Internet-based applications. This was due to a combination of inadequate infrastructure, a lack of knowledge about potential benefits and low interests in the new technologies. As a consequence, farmers in this study were seemingly ignorant of the potential capabilities of Internet-based tools and the range of their communication network and information sources reflected these limitations. Chapter 3 showed that participants gravitated toward communication devices that were readily

available, portable and easy to use. Radios and mobile phones (voice feature) received greater use than other devices.

There were other means of communication and information transfer that are not fully utilized by farmers in the study. For instance, although text messaging is cheaper than the voice feature on the mobile phones, it failed to attract as many users. Reasons for this non-use ranged from complaints about the size of the instruments to ignorance about the steps required to send and receive text. Television too, was under-utilized for agricultural information. They reported that there were only a few agricultural programs that were of interest to farmers and that the times when those programs were being broadcasted smallholder farmers are unavailable and unable to watch.

In order for smallholder farmers to contribute more meaningfully to food security they must be able to access information, adopt new technologies and maintain relationships with a wide variety of actors. The study showed that the farmers' limited use of ICTs was reflected in a lack of information and low levels of linking and bonding social capital. However, the presence of strong family bonds and community relationships helped to maintain formal and informal communication networks at the community level. This information is useful because it can allow policymakers to directly improve information flow by building on the existing user patterns and social processes. Waller (2010) believed and this research confirmed, that the basic institutional framework, social processes and user patterns for ICT solutions among smallholder farmers, already exist in Jamaica. However, he argued that the political will is the missing element.

An analysis of the sectoral policy discourse revealed that there were no clear strategies or consistent policy interventions designed to address the lack of ICT capacity and efficacy issues

facing smallholder farmers. Notwithstanding this, an electronic, database for the dissemination of marketing information, and other forms of e-governance for stakeholders within the sector were introduced. These undertakings will have very little direct impact on certain segment of the smallholder farming sub-population, because the majority of the farmers in this study have very low adoption rates of new ICTs and require education and capacity building for efficacy with the technologies before they can participate in the process.

Policies have a role to play in providing an enabling environment for smallholder farmers to exercise human agency. However, when flawed technological deterministic approaches take for granted that ICTs will be adopted and used by farmers to reduce food insecurity, smallholder farmers are at risk of being excluded. The benefits that can be derived from such improvements will be lost because farmers, such as the participants in this dissertation, lack the structural and educational prerequisites (see Wilson, 2004). Interventions of this nature that can lead to greater inequality among farmers in the agriculture sector will need to be monitored and evaluated to provide feedback to policymakers. If attention is not paid to the information and network needs of smallholder farmers within the agricultural sector, then the revolutionary capabilities that ICTs can have, on the transformation of the industry, will make the task of achieving food security more difficult.

The state remains a vital player in the agricultural sector in Jamaica but the discursive messages combined with the valued discussions with small farmers have shown that government's interventions have failed to adequately mobilize resources to target a large segment of the smallholder farmers' population. Socially constructed images of smallholder farmers, as being static, resource poor and lacking the capacity for investments and development,

have meant that they were overlooked for important government programs. Policymakers need to be mindful of the fact that smallholder farmers are not a homogeneous group and they all, to some degree, contribute to some food availability. The country can ill-afford to alienate participants in the food and agricultural sector therefore these stewards of the local food system must be accommodated in plans for sustainable food security outcomes.

Conspicuously, the decade-long sectoral policy discourse sparingly included text salient to other significant issues, such as climate change, food sovereignty and food justice that are critical to reducing the problems associated with food insecurity. The absence of a comprehensive long term plan for addressing food insecurity and the exclusion of a broad collaborative agenda are notable oversights in the discourse emanating from decision makers in the country. These are necessary to meet food security outcomes in a new and dynamic policy arena.

Policy Implications

It was apparent, from the evidence in this research, that from 2003 to 2013, many of the food security policy interventions in the food and agricultural sector in Jamaica were top-down directives framed in economic terms. The data in this dissertation highlighted the fact that there are other social, technological and political variables that can have substantial bearings on food security outcomes. These other factors include, but are not limited to, the use of ICTs, levels of social capital, the nature of discourse used to communicate national goals and farmers' motivational orientations. Taken together these variables create synergies that are important for improving the sector's human resources but which, if ignored, can impinge on the performance of key stakeholders. Hence, what is required is context-specific evidence for more collaborative

approaches to food security policymaking. Approaches that will also use knowledge of the heterogeneity among the smallholder farmer population to improve the allocation of resources and to foster human agency through policy. Policies that exclude issues relevant to small farmers' welfare, the environment, and social equity will ultimately fail to address key problems associated with food insecurity.

In Jamaica, policy responses to food insecurity need to be conditioned by a new perception of the problem. Redefining food insecurity as a problem connected to all dimensions of national development, including technology, health, education and the environment, would help to focus attention on underlying causes and inter-connected challenges associated with this very complex issue. Examining food security through different frames would help to promote collaborative efforts for solutions across sectors of the economy. This multiple actor-multiple sector approach may lead to a change in the policy venue therefore traditional practices of agricultural exceptionalism will be expunged from the policy process. Policy changes occur whenever there are changes in institutional venue, problem definition and new policy entrepreneurs take advantage of 'policy windows' (see, Baumgartner & Jones, 1993; Kingdon, 1995).

There is a need, first and foremost, for a strong government commitment focusing on the developing capacity of key stakeholders. Areas for urgent capacity development included ICT use and access to information. Private sector incentives combined with public sector outlay can provide services in rural areas that can be beneficial to smallholder farmers. Additionally, by demonstrating and teaching the skills necessary for ICT adoption and use, policies can be implemented to support programs and projects that are formulated to address the constraints

associated with different segment of the smallholder farmer population. *Sustainers*, for example, will need targeted support to build their educational and financial capacities. *Go-getters*, are primed for interventions that will facilitate their access to credit, access to information and expansion of their communication networks. *Stalwarts*, with their wealth of experiences, are a human resource that can be utilized for mentorship and knowledge transfer. They could also benefit from education about ICTs and new farming techniques. The improved agricultural network would be beneficial to *Entrepreneurs* as well. The large volumes of traditional food crops produced by *Entrepreneurs* could be targeted for expanding the manufacturing industry to increase the value-added, food access and food availability in the country.

The findings of this study have far reaching policy implications for institutional, infrastructural strengthening and capacity building. Policymakers should pay close attention to supporting the development of grassroots community-based associations and producer organizations that have emerged to satisfy the specific needs of their members. In this study, small grassroots organizations received higher levels of participation, from smallholder farmers; than did the larger more established interest groups. This is a clarion call for policies that will facilitate training, group development and capacity building strategies to harness and use the human and social capitals available within these local organizations. National food security outcomes will be dependent on these successes. As to whether the government and the institutions, charged with the responsibilities of delivering services to smallholder farmers, have the mechanisms, resources, and political will to provide these goods and services as public goods will be a pivotal consideration for the future of food security in Jamaica.

Limitations of the study

The scope and depth of this study were limited in by the time and funding available for its execution. As a consequence, sampling was restricted to the Western section of the island, and follow-up interviews or focus group discussions with the participants, which would have helped to provide more far-reaching analysis of farmers' experiences, were not done.

Additionally, this study did not take into account the impact of land tenure, which was referenced in review of literature as a long-standing issue of social inequality in the sector, on smallholder farmers' behavior and classification. Access to land and the availability of land are factors that could potentially influence the behavior of smallholder farmers but the issue of land ownership in Jamaica is complex (see Elliot & Palmer, 2008; McBain, 1992; Weis, 2004 for a discussion). Therefore, it was a deliberate decision to exclude overt references to the subject that is often examined with regards to social inequality and social justice.

Contribution to the literature

The evidence in this study contributes to meaning making in food and agricultural research. It puts forward an understanding of context-specific indicators for inclusion in food security policymaking. The research will serve to reorient the thinking of policymakers to recognize that there are local factors that must be included in efforts to mitigate to the impact of food insecurity. It illuminated the need for policymakers to be mindful of heterogeneity among the smallholder farming population and use this knowledge to inform the efficient and effective allocation of scarce resources. Exploring the synergetic relationships between social capital and ICTs to enhance access to food and food availability are key strategies for improving information

transfer and communication networks. This is necessary to foster greater freedom and networking capabilities of smallholder farmers.

In addition to the foregoing, the data also highlighted the historical themes in policymaking embedded in sectoral policy discourse and disjuncture between those interventions and current approaches needed to increase the capacity of smallholder farmers in Jamaica. Consequently, this research contributes to the debate on food security by advancing the notion that the examination of otherwise overlooked variables, which do not constitute dominant frames, can provide useful data for innovative context-specific approaches to guide food security policymaking and improve food security outcomes.

Suggestions for future research

Where the research on Jamaica's smallholder farmers and food security strategies goes next is important to policymaking. Considerations for the fact that food is social, cultural economic, environmental and political should lead to research that transcends agriculture, to cut across many different ministerial, disciplinary and policy fields. Thus, addressing food security research in a collaborative inter-sectoral manner will be crucial. Researchers would be well advised to examine food insecurity for the complex issues that undermine its achievement. A re-definition of the problem to include input from other sectors in the society is suggested. Policies formulated to achieve food security outcomes need to be coordinated across multiple government ministries (see Gibson, 2012). Following from that, future research should address the paucity of evidence pertaining to the impact of specific policies on target populations. Therefore, monitoring and evaluating policies in the agricultural sector is another important researchable

area. These studies will provide feedback to policymakers and to allow for changes to be made to policies if it were deemed necessary.

Researchers and policymakers' emphasis on the biophysical factors that impact agricultural productivity often serve to detract from the other multifunctional dimensions of agriculture that potentially facilitate positive spin-off impact on food security. Case studies demonstrating the value and merits of agricultural multifunctionality, for instance, could expand discussion on food security to include other sectors of the economy and widen the range of possible solutions.

In conclusion, considering the variables examined in this dissertation, it can be determined that smallholder farmers, both:

Women and men can make things better...for themselves through human agency... [and] can truly widen their choices – if [aided by policies] they are able to mobilize the vision, political will and human capacities necessary to achieve greater freedom and the good life in our globalizing world (Wilson, 2004, p. 405).

However:

“In this endeavour, there is no substitute for benevolent political will and, although the once thought notion that food security goals could be achieved in isolation are gone, embracing new ideas, such as women or smallholders and the like, might well turn out to be the key to food security for the future” (Gibson, 2012, p. 516) .

REFERENCES

- Baumgartner, F. & Jones, B. (1993). *Agenda and instability in American politics*. Chicago, IL: University of Chicago press.
- Elliot, D. & Palmer, R. (2008). Institutions and Caribbean economic performance: Insights from Jamaica. *Studies in comparative international development* 43(2), 181 – 205.

- Gibson, Mark. (2012). *The feeding of nations: Redefining food security for the 21st century*. Boca Raton, FL: CRC Press.
- Kingdon, J. (1995). *Agendas, alternatives, and public policies*. Boston, MA: Little, Brown.
- McBain, H. (1992). Constraints on the development of Jamaican agriculture. In, C. Stolberg and S, Wilmot (eds.) *Plantation economy and the peasantry in a historical perspective: Jamaica 1838 – 1980*, (pp. 127 – 144). Kingston, Jamaica: Friedrich Ebert Stiftung.
- Waller, Lloyd. (2010). Mobile phones and the possibilities for Jamaican farmers. Commentary, *Gleaner*, May 10, Retrieved from <http://jamaica-gleaner.com/gleaner/20100505/cleisure/cleisure3.html>
- Weis, T. (2004). (Re-)Making the case for land reform in Jamaica. *Social and economic studies* 53(1), 35 – 72.
- Wilson, Ernest, J. (2004). *The information revolution and developing countries*. Cambridge, MA: The MIT press.

APPENDIX

December 13, 2012

MEMORANDUM

TO: Deborah Brown
Jennie Popp

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 12-11-272

Protocol Title: *Food Security in Jamaica*

Review Type: ☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB

Approved Project Period: Start Date: 12/13/2012 Expiration Date: 12/12/2013

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 50 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.