

Pursuing Sustainability in Food Systems through Womanism and Community Development:
Family Farmers Cooperative in Northeast Brazil

Monica Nunes Dantas

A Thesis
In
The School of Graduate Studies

Presented in Partial Fulfillment of the Requirements
For the
Degree of Doctor of Philosophy (Individualized Program) at Concordia University
Montreal, Quebec, Canada

September 2022

© Monica Nunes Dantas, 2022

CONCORDIA UNIVERSITY
School of Graduate Studies

This is to certify that the thesis prepared

By: **Monica Nunes Dantas**

Entitled: Pursuing Sustainability in Food Systems through Womanism and Community

Development: Family Farmers Cooperative in Northeast Brazil.

Submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy (INDI Program)

Complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Graduate Program Director: Rachel Berger

Signed by the final Examining Committee:

Eldad Tsabary	Chair	_____
Alan Nash	Committee member	_____
Marguerite Mendell	Committee member	_____
Bengi Akbulut	Internal-external examiner	_____
Cecilia Rocha	External-external examiner	_____
Satoshi Ikeda	Supervisor	_____

Approved by:

Felice Yuen, Graduate Program Director

September 1st, 2022.

Effrosyni Diamantoudi, Interim Dean, School of Graduate Studies

ABSTRACT

Pursuing Sustainability in Food Systems through Womanism and Community

Development: Family Farmers Cooperative in Northeast Brazil.

Monica Nunes Dantas, Ph.D.

Concordia University, 2022

This manuscript-format thesis examines the sustainability of local food systems and the potential for community development in Brazil's Rio Grande do Norte (RN) State. Participatory action research (PAR) methodology was adopted to map the conditions, issues, and possibilities within family farming and the social solidarity economy initiative, the Xique-Xique Network (RXX). Primary data from participant observation and semi-structured interviews complement the indicator-based assessment grounded on the International Fund for Agricultural Development (IFAD) indicators. The first manuscript shows how family farming suffers from systemic problems, such as insufficient support from public institutions, conditions imposed by the influence of agribusiness biases, lack of basic infrastructure, discouraging regulations, lack of capital, limited access to credit, environmental problems, the negative image associated with family farming and difficulty accessing modern technologies. The second manuscript highlights the ways academic documentation and communication could positively contribute. The third manuscript investigates the conceptualization of food using a semiotic analysis to understand the notion of food in mainstream media, including an analysis of "Google Images." The study found that mainstream media's portrayal or suggested meaning influences food conceptualization. Also, there was a discrepancy between the portrayed images and their respective concepts, such as the idealized agribusiness notion of a thriving food system. The oversimplified views of different food systems influence food choices by either promoting or obstructing the development of food systems. The fourth manuscript concentrates on integrating sustainability aspects into gender and social norms. The findings show how social norms permeate sustainability practices. It also suggests that the farmer's approaches regarding education and their vision for societal transformation were a reflex to their experience with the landless workers' movement. The study further identifies several gaps to address and boost the involvement of farming women. However, the narrative analysis revealed that the RXX praxis actively promotes positive gender dynamics in multidimensional ways. Women are in positions of leadership and prioritize childcare to warrant their inclusion. The last manuscript proposes a sustainable food systems model that emerged from the integrated praxis of womanism, agroecology, and solidarity. This model is centred on a joined view of sustainability, local social norms, and gender dynamics. It presents unique drivers and distinctive ways to express the usually disjoining aspects of sustainability in food systems

ACKNOWLEDGEMENT

Throughout the writing of this dissertation, I have received a great deal of support, assistance, and compassion. I would first like to thank my supervisor, Professor Satoshi Ikeda, whose contribution was invaluable throughout my long journey in completing this work and inspired my interest in exploring unconventional research approaches and practices that seek alternatives to bring about transformational research. Your insightful feedback and kindness allowed me to continue and pushed me to sharpen my thinking to bring my work to a higher level. To Professor Marguerite Mendell for her expertise in solidarity economy and community development and for providing valuable guidance throughout my studies. To Professor Alan Nash for your compelling insights on the development of street markets and your contribution to helping me formulate the research questions and design.

I would also like to thank the support of the program Ciências sem Fronteiras (CAPES), Brazil, for partially funding this research.

I want to acknowledge the friends who facilitated my fieldwork in Natal and Mossoro in Northeast Brazil for their outstanding collaboration. I would particularly like to single out Gerlane da Silva and Lidiane Freire. I want to thank them for their support and all the opportunities they provided during my research.

In addition, I could not have completed this dissertation without my family and friends' support, my parents and sisters who are always there for me, my children who kept me going, and my husband, who constantly reminded me I was enough and provided for our family. Finally, to my friends, who offered stimulating conversations and happy interruptions.

CONTRIBUTION OF AUTHORS

This thesis was written in a manuscript format and included a collection of manuscripts that have been published or are in preparation for publication. The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation of all articles presented in this thesis under the supervising committee. The author also acknowledges the co-creation process included in the research design that allowed the research participants to contribute to the definition of research objectives.

Most of the published manuscripts presented in this thesis are single-authored, except for the article entitled: Mapping the Current Condition of Solidarity Economy and Family Farming in RN, Northeast of Brazil, published in the European Journal of Sustainable Development in 2017. This is to acknowledge the co-author, Dr. Satoshi Ikeda, my main supervisor, for his contribution to this publication, which consisted of revising the results and the approval of the manuscript for publication.

Table of Contents

LIST OF ABBREVIATIONS	viii
LIST OF FIGURES	x
LIST OF TABLES	xi
1. GENERAL INTRODUCTION	1
CONTEXT: THE BRAZILIAN NORTHEAST	1
THESIS STRUCTURE.....	5
RESEARCH CONTRIBUTIONS	7
2. INTERDISCIPLINARY LITERATURE	9
SOCIOLOGY OF FOOD.....	9
SUSTAINABLE FOOD SYSTEMS AND PUBLIC POLICIES.....	12
FAMILY FARMING AND THE SOCIAL SOLIDARITY ECONOMY IN LATIN AMERICA	16
GENDER STUDIES: WOMEN INITIATIVES AND WOMANISM.....	19
WOMANISM.....	20
3. RESEARCH DESIGN	22
INTERDISCIPLINARITY	22
PARTICIPATORY APPROACH.....	22
PARTICIPANTS AND DATA COLLECTION.....	23
MANUSCRIPT FORMAT	24
4. MAPPING THE CURRENT CONDITION OF SOLIDARITY ECONOMY AND FAMILY FARMING IN RN, THE NORTHEAST REGION OF BRAZIL	25
METHODOLOGY	30
MAPPING	30
RESULTS AND DISCUSSION	31
MAPPING CONDITIONS.....	31
THE ROLE OF RESEARCH	33
THE ROLE OF INSTITUTIONS	34
CONCLUSIONS AND IMPLICATIONS	35
5. THE ROLE OF INSTITUTIONS IN PROMOTING RESILIENCE IN DEVELOPING SUSTAINABLE FOOD SYSTEMS: THE FARMER'S PERSPECTIVE IN THE NORTHEAST OF BRAZIL	37
INTRODUCTION	37
ALTERNATIVE FOOD SYSTEMS AND SOCIAL SOLIDARITY ECONOMY	38
CASE STUDY	41
RESULTS.....	43
INSTITUTIONS AND NETWORKS ACTIVELY SUPPORTING FARMERS AND ARTISANS	43
THE EXPECTED ROLE OF INSTITUTIONS AND NETWORKS.....	45
GOVERNMENT IDEOLOGY AND VULNERABILITY	46
CONCLUSION.....	48
6. ‘GOOGLE IT’: A SEMIOTIC UNDERSTANDING OF FOOD CONCEPTUALIZATION AND ITS POSSIBLE EFFECTS.	51
INTRODUCTION	51

RESEARCH DESIGN	53
LITERATURE REVIEW	54
FOOD SYSTEMS	54
RESULTS AND DISCUSSION	62
FINAL CONSIDERATIONS.....	70
7. INTEGRATING SUSTAINABILITY ASPECTS TO GENDER AND SOCIAL NORMS TO GUIDE BETTER FAMILY FARMING POLICIES	73
INTRODUCTION	73
RESEARCH DESIGN AND METHODS	74
LITERATURE REVIEW.....	75
RESEARCH FOR SUSTAINABLE FOOD SYSTEMS.....	75
WOMANISM AND SUSTAINABLE AGRICULTURE.....	76
RESULTS AND ANALYSIS – FARMERS’ NARRATIVES ASSESSMENT	78
CONCLUSIONS.....	86
8. MODELING SUSTAINABLE FOOD SYSTEMS FROM THE INTEGRATED PRAXIS OF WOMANISM, AGROECOLOGY, AND SOLIDARITY	88
INTEGRATED SUSTAINABILITY ASPECTS.....	91
EXTERNAL DRIVERS	94
INTERNAL DRIVERS	95
CONCLUSION AND RESEARCH LIMITATIONS.....	96
REFERENCES	100
APPENDICES:	109
APPENDIX A: INFORMATION AND CONSENT FORM	109
APPENDIX B: LETTER OF COOPERATION FROM AACC.....	112
APPENDIX C: CERTIFICATE OF ETHICAL ACCEPTABILITY.....	113
APPENDIX D: RESEARCH-CREATION INITIAL PROPOSAL AND FIELDWORK TEMPLATES – PORTUGUESE	114
<i>Questionário 1 - dirigido a ativistas, economistas, políticos ou acadêmicos:</i>	116
<i>Questionário 2 - respondido por agentes de desenvolvimento comunitário.....</i>	117
<i>Questionário 3 - Perguntas feitas aos atores diretamente envolvidos (artesãos, agricultores familiares).....</i>	118
APPENDIX E: RESEARCH-CREATION INITIAL PROPOSAL AND FIELDWORK TEMPLATES – ENGLISH TRANSLATION	120
<i>Questionnaire 1 - aimed at activists, economists, politicians, or academics.....</i>	122
<i>Questionnaire 2 - answered by community development agents.....</i>	123
<i>Questionnaire 3 - Questions asked to the actors directly involved (craftsmen, family farmers)...</i>	124

LIST OF ABBREVIATIONS

<i>Associação de Apoio às Comunidades do Campo</i> (AACC).....	38
Brazilian Agricultural Research Corporation (Embrapa).....	48
Brazilian Ministry of Education (MEC).....	64
Brazilian Special Secretariat of Family Agriculture (SEAF) (SEAF)	46
Community-Supported Agriculture (CSA)	67
Confederação Nacional dos Trabalhadores na Agricultura (CONTAG).....	36
Cooperative Central de Comercialização da Agricultura Familiar e Economia Solidária (CECAFES).....	14
<i>Coordinadora Latinoamericana de Organizaciones del Campo</i> (CLOC).....	34
Declaration of Aptitude to Pronaf (DAP)	66
Fernando Henrique Cardoso (FHC)	35
Food and Agriculture Organization (FAO)	49
Genetically Modified Organisms (GMOs)	45
Gross domestic product (GDP)	79
Individualized Research Program (INDI).....	9
Institutional Ethnography (IE)	9
<i>Instituto Brasileiro de Geografia e Estatística</i> (IBGE).....	9
International Fund for Agricultural Development (IFAD).....	ii
International Panel of Experts on Sustainable Food Systems (IPES).....	59
Max Weber Qualitative Data Analysis (MAXQDA)	46
Ministry of Agrarian Development (MDA).....	27
Ministry of Agriculture and Supply (MAPA).....	27
Ministry of Social and Agrarian Development (MDSA).....	36

<i>Movimento dos Trabalhadores Sem Terra</i>	
(MST).....	35
National Confederation of Agriculture and Livestock	
(CNA).....	68
National Institute of Colonization and Agrarian Reform	
(INCRA).....	55
National Land Credit Program	
(PNCF)	66
National Supply Company	
(Conab).....	48
not-for-profit organizations	
(NGOs).....	54
Organisation for Economic Co-operation and Development	
(OECD)	83
Participatory action research	
(PAR)	ii
Program of Food Acquisition (PAA)	
(PAA)	13
Program to Strengthen Family Farming	
(PRONAF)	12
<i>Réseau Intercontinental de Promotion de l'Economie Sociale et Solidaire</i>	
(RIPESS).....	33
Rio Grande do Norte	
(RN).....	ii
Secretariat of Family Agriculture and Corporatism	
(SFAC)	66
State University of RN	
(UERN)	99
Superintendence for the Development of the Northeast	
(Sudene)	56
UN's Sustainable Development Goals	
(SDGs).....	20
United Nations	
(UN)	45
United States	
(US).....	35
United States Agency for International Development	
(USAID).....	64
Worker's Party	
(PT).....	35
Xique-Xique Network	
(RXX).....	ii

LIST OF FIGURES

Figure 1 Delimitação do semiárido no Nordeste. (The Northeast semiarid delimitation) Source: IBGE/SUDENE (2017).	2
Figure 2 Principais ecossistemas brasileiros. (Main Brazilian Biomes) Source: UOL education ...	3
Figure 3. Compiled results overview made with NVivo.....	31
Figure 4. Hierarchical code models created with the use of software MAXQDA.....	43
Figure 5. Hierarchical code model created with the use of software MAXQDA	45
Figure 6. Hierarchical code models created with the use of software MAXQDA.....	46
Figure 7. The Semiotic Pentagram Framework. (Cordeiro & Filipe, 2004)	53
Figure 8. Commodity Factory	56
Figure 9. MAPA and MDA Federal Budget in Real.....	62
Figure 10. Sistemas Alimentares.....	64
Figure 11. Agribusiness Semiotic Pentagram	65
Figure 12. Family Farming Semiotic Pentagram	67
Figure 13. Family Farming & Agribusiness.....	69
Figure 14. Photo from RXX Facebook page.....	89
<i>Figure 15. RXX Organizational Model</i>	<i>89</i>
Figure 16. Detailed Organizational Model.....	91
Figure 17. Food System Model based on Womanism, Agroecology and Solidarity	94

LIST OF TABLES

Table 1. Selections translated from narratives	79
Table 2. Selections translated from narratives	80
Table 3. Policy guide for integrating sustainability aspects, social norms, and gender dynamics	83
Table 4. Praxis integrates sustainability aspects through womanism and the logic of care.....	92

1. GENERAL INTRODUCTION

This research explores global food systems in their larger context and the development of a sustainable food system in a local context. Food as a topic has become extremely popular in the media, market advertisements, academia, and environmentalist discourses. If there is one system that holds considerable power over some of the most critical aspects of our societies, such as health, environment, economy, culture, and politics, it would be our complex, highly industrialized, and globalized food systems. This thesis is a component of the Individualized Research Program (INDI) offered at Concordia University for research that falls outside the normal disciplinary boundaries of research and creation. Thus, it is an interdisciplinary study to accommodate the multiple disciplinary concerns in researching food systems and the mixed methods used. The main subjects of this research focus on the sociology of food, sustainability, community development, and narrative analysis.

For the literature review, the researcher sought the involvement of her thesis advisor Professor Satoshi Ikeda and the input of farmers that participated in this research to identify guiding questions. Thus, the preliminary study focuses on how academic research can help build sustainable food systems. From the initial research, the following questions emerged: What is the current condition and understanding of family farming and solidarity economy? What is the role of institutions in sustainable food systems? How can farmers pursue sustainability, be it economic, environmental, or social?

Therefore, the objective is to understand how family farming households produce food, generate income, manage farmsteads and occupy spaces related to their activities. The research will not describe the detail of farmers' day-to-day activities. Instead, the study uses Institutional Ethnography (IE) and narrative analysis as methods of social inquiry to analyze how people's daily activities connect to institutional arrangements and ruling relations. Norstedt & Breimo, (2016, p.1) and Allen (2017, p. 1070) state that narrative analysis is used to interpret stories told within the context of research to guide the research context. Thus, this research also focuses on interactions between external and internal (community) drivers as the forces or social norms that influence the local food systems. The study aims to create guiding suggestions to contribute to the literature on public policies for sustainable food systems and programs intended to develop sustainable food systems by exploring current debates and critical issues in agricultural and rural development in the Northeast Region of Brazil.

Context: The Brazilian Northeast

A longstanding history of exclusion has marked Brazil's Northeast region. The 2017 *Instituto Brasileiro de Geografia e Estatística-IBGE* (2017) census revealed that the lowest wages in Brazil come from this region, as it has in the past. The research will not explore these regional differences in income in-depth. For a brief explanation, however, the regional disparities in income are complex and rooted in the colonization followed by the industrialization processes when national efforts to transform the nation's industrial strength were concentrated only in the south and southeast of the country. The Northeast has wide disparities in infrastructure when compared to the South and Southeast regions, particularly in the rural areas. The Northeast Region comprises nine coastal states located at the top right of the country. It has a semi-arid

climate and occupies a space equivalent to 18.27% of the Brazilian territory. Below is a map of the nine Northeastern states. The area highlighted delimits the semiarid region.

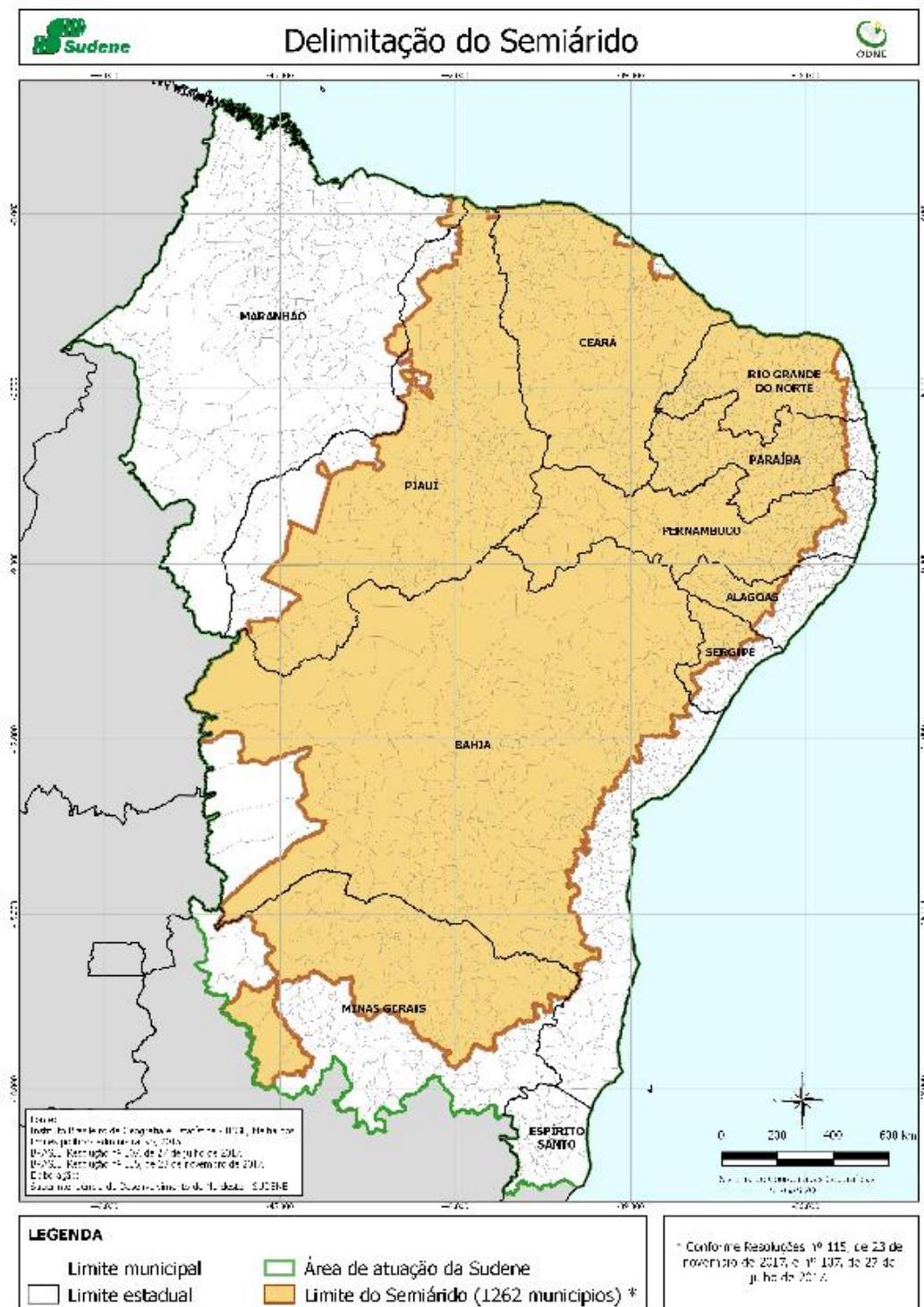


Figure 1. Delimitação do semiárido no Nordeste (The Northeast Semi-arid Delimitation). Source: IBGE/SUDENE (2017).

In addition to the sociopolitical exclusion, the Northeast Region of Brazil has a complex environmental composition with distinct ecosystems. Shown below are the main ecosystems in Brazil: The Northeastern semi-arid region. On the top right of the map are the following biomes: *Caatinga*, *Cerrado*, *Atlantic Forest*, *Restinga*, and *Mangrove*. The *Caatinga* is predominant.



Figure 2. Principais ecossistemas brasileiros (Main Brazilian Biomes). Source: UOL Education.

Because of this natural composition, the region did not respond to the introduction of monoculture or industrialized farming like South and Southeast Brazil did. The *Caatinga*, according to Kiill (2011), occupies 70% of the Northeastern region and is a biome unique to Brazil. This means that much of the biological heritage of this region is not found anywhere else in the world. An arid scenario describes the *Caatinga*, which in the Tupi-Guarani language means white forest because, in the dry season, the vegetation loses its leaves and turns white. Kiill (2011) emphasizes the characteristics of this vegetation as it is uniquely adapted to the semi-arid conditions, making its preservation for that reason alone important.

In the last century, the occurrence and lengthens of droughts have continued to grow in the region. Almeida, and De Jesus (2012) explained that this is a natural desertification process, accompanied by the excessive exploitation of non-native and inadequately compatible crops, accelerating its progression. Buriti and Barbosa (2019) claim the manmade impact on the desertification process might have more weight than what is generally established. The lack of infrastructure and public policies to support better-living conditions to deal with extended periods of droughts in the semi-arid regions have contributed to the continuous impoverishment of this area. The drought in Northeast Brazil is extensively recorded in the literature.

Despite significant uncertainty regarding future changes in the frequency of droughts, adaptation strategies must be established based on the best available scientific information (Camilloni et al., 2020). However, the literature and public policies for Northeast Brazil have prioritized drought monitoring and crisis management initiatives for over a century. These programs have been ineffectual in lowering the occurrence of the adverse outcomes caused by droughts for the bulk of the population, as they target the effects of droughts (de Arajo et al., 2021). Façanha (2019, p.348) explains that these policies are historically short-term, emergency

responses, fragmented, and without any long-term benefit to the local population. Buriti and Barbosa's (2019, p.279) historical analysis of water policies in the Northeast showed that the Brazilian government's response to droughts was based on the conception that it would be possible to correct the climatological regime of the region, thus enabling the inclusion of the region in the national plan of large agricultural production. This would occur by installing an apparatus that, in theory, would transform the population's lives. However, investments in the construction of megaprojects did not solve and, according to the authors, even worsened the social vulnerability related to the effects of drought in Brazil. The significant works implemented strengthened the power of Northeastern political and economic oligarchies. The regional literature on the development of adaptive and regenerative agriculture is still deficient.

In addition, women and girls are affected disproportionately by droughts and the lack of infrastructure in the region. To analyze the relationship between gender and access to resources, a special focus on women's power and public policy is needed (Ahlers; Zwartveen, 2009). Studies that analyze the domestic and public space occupied by women are necessary to understand how gender relations affect access to production resources and female participation in decision-making (Cornwall; Harrison; Whitehead, 2007; Laurie, 2011). Such studies are emerging worldwide but have yet to spark in the region. In Marengo et al.'s (2021) paper, the critical view on many of the Brazilian drought strategies in this area states that they form an instance of maladaptation going in the inverse direction and worsen the desertification problem. In response to the above assessment and to promote further development of the Brazilian territory, the government has partaken many initiatives. The following projects were some of the initiatives created to alleviate drought in Northeast Brazil.

The Pronaf Semiárido, the Brazilian government's National Program to Strengthen Family Farming, was established in 1995 to assist FA financially. It is now one of the biggest rural loan programs in the nation, with over 4 billion USD in funding for the 2019/2020 season (Marengo et al., 2021). PRONAF offers 12 different forms of financial loans, such as a line dedicated to the semi-arid area of Northeast Brazil, the "PRONAF Semiárido." This service offers loans for the establishment, expansion, rehabilitation, and modernization of facilities, encompassing agricultural and non-agricultural projects that address semi-arid environments, with a minimum of 50 percent of the credit for water supply (Marengo et al., 2021). Producers in the semi-arid zone may receive up to 4,000 USD to construct or improve small reservoirs or subterranean dams. Unfortunately, those funds do not reach all those in need in rural regions. Smallholder farmers still have a dearth of knowledge and capacity development to construct and manage such networks (Marengo et al., 2021). As a result, financial resources alone may not be sufficient. Programs focused on capacity development in climate-smart, and adaptable farming is critical for engaging farmers and optimizing such resources.

The Garantia-Safra program has credits and farm subsidies to help farmers weather the effects of drought. Whenever a region in Northeast Brazil is hit by severe drought, the Brazilian government offers emergency subsidies, comparable to farmer's coverage, to assist small-scale producers in coping with the effects of the drought. Garantia Safra is the name of this project (Alvalá et al., 2017). Garantia-Safra insurance payments totalled around 660 million USD in 2012. This figure exceeds 2.1 billion USD in agriculture insurance payouts between 2012 and 2016 (Alvalá et al., 2017). The 2012–18 droughts in Northeast Brazil were unprecedented in their severity and effect on the area's economy and society (Martins et al., 2016). In contrast to the

harsh disasters of 1983 and 1998, this state effort successfully prevented acute social upheaval or substantial migration out of Northeast Brazil during the 2012–18 disasters. In addition, they contributed to reducing socioeconomic vulnerabilities and assisting impoverished small farmers and rural labourers in Northeast Brazil. As Alvalá et al. (2017) propose, it is necessary to strengthen embedded water management, enforce a constructive approach rather than reactive drought legislation, reorganize the economy of semi-arid zones to make it less climate-dependent, and strengthen human capabilities, via education.

The Program of Food Acquisition (PAA) is a federal government initiative in Brazil that appropriates food for state institutions, including schools and healthcare facilities (Saito, 2020). The State's food procurement process includes a bidding process to which food suppliers should be allowed to subscribe by submitting prospective pricing freely. Administrators often adopt free-market reasoning to support the so-called most economically beneficial tender, which typically benefits large-scale or industrial firms (Saito, 2020). However, there is a 30% minimum quota for school lunches and other produce demands to come directly from small-family farming. This aims to advance the modern economy of redistribution to the family farming sector while maintaining affordable pricing. This rationale must be in place to ensure dispersal access and quality. This program implies that comparatively small food manufacturers should be allowed to engage in bidding processes based on their ability to provide an adequate supply of high-quality food via sustainable agriculture.

Thesis Structure

The thesis is structured in sections as follows. Chapter One provides a general introduction. Chapter Two presents the research design and mixed methods used in this study and describes the analytical processes and tools used.

Chapter Three is a published manuscript that surveys the current conditions of SSE and family farming in the Northeast Region of Brazil. The manuscript examines the sustainability of alternative local food systems, the role of food provision, the level of food security, and the possibility of community development. The research method used Participatory Action Research (PAR). This chapter's main objective is to map the current condition of the SSE and family farming in cooperation with the participant farmers. The results expose contemporary dilemmas and possibilities for the SSE and the importance of supporting institutions in this microregion. Furthermore, the results of mapping the conditions served to identify the external drivers that contributed to the model's composition for sustainable food systems.

Chapter Four is a published manuscript dedicated to recent debates about Brazilian agricultural and institutional structures. Agriculture presents itself in opposing directions in the Brazilian context: agribusiness and family farming. Through time, agribusiness has developed an extensive apparatus of institutions and policies to ensure its success. Family farming, on the other hand, has had less support. This study investigates family farming in the State of Rio Grande do Norte (RN), focusing on Rede Xique-xique and the Cooperative Central de Comercialização da Agricultura Familiar e Economia Solidária (CECAFES). The regional focus is the Northeast of Brazil. This region has endured severe water shortages, rural exodus, the lowest income in the country, and a lack of infrastructure and public policies to support better living conditions. The

study's results brought a unique perspective from family farmers in RN about the role of institutions, especially governmental ones, and the effects of recent institutional dismantling caused by government change in Brazil. The result also identifies the ways farmers foster resilience in times of crisis.

Chapter Five is a manuscript in preparation for publication that displays an essential aspect of sustainability research on food systems and the conceptualization and practice of knowledge that can shape people's understanding or perception of the food system. The guiding question for this chapter came from the concerns of family farmers about the image associated with being a family farmer and the perceived impact of their production on society. This study interprets the views of farmers from the Northeast Region of Brazil on food systems. It compares them to the semiotic sign systems currently representing the food system in mainstream social media. The analysis utilized the Semiotic Pentagram Framework developed by Cordeiro and Filipe (2004). The study explores food systems as a semiotic sign, which in the context of this chapter, the represented image for the keywords associated with food systems and their underlying messages in mainstream media. Using semiotics to analyze the current polarization of agriculture offers a platform for revisiting a necessary debate that can provide an opportunity for stakeholders, such as family farmers and consumers, a starting point to drive a re-visualization of food systems. Furthermore, understanding the mainstream image and channels associated with food choices may provide an opportunity to democratize the access to reshape these classifications and offer other ways to communicate the promotion of healthier individual and collective food choices. Access to these channels might provide farmer's networks with a broader reach in influencing food choices than official food guides.

Chapter Six is a manuscript in preparation for publication. The research in Chapter Six takes place at the intersection of agroecology, solidarity economy, and feminism. This manuscript uses narratives to explain the inaction on gender mainstreaming policy implementation. It highlights the multidimensional role of gender in agriculture through the exploration of self-organization and praxis within agricultural groups. Women represent a considerable proportion of the labour force in family farming, yet agricultural development still overlooks the disadvantages and inequities women face. Furthermore, there is a shortage of linkages of social norms and institutions involved with agricultural development, especially social norms related to gender and community organization, which are the focus of this research. As a methodological approach, institutional ethnography (IE) helps analyze how institutionalized entities interact with the organization of local food systems in this micro-region. The analyses combine indicator-based assessment grounded on the indicators presented in the guide developed by the IFAD to offer a practical suggestion to public programs.

Chapter Seven presents a detailed model based on the integrated praxis of womanism, agroecology, and solidarity at Xique Xique Network (RXX). The model was constructed using the results of this research's manuscript collection. The model was built using the mapping from Chapter Three to identify the external drivers affecting the food systems in the region. In addition, it uses the results of Chapters Four and Five to describe the multidimensional ways these external drivers affected the food system in this context and analyze their macro relations. The analysis of the roles of institutions contributed as they explain how institutions contribute to shaping food systems by promoting or obstructing their development. The pillars for this model were drawn from principles identified and described in Chapter Six from the narrative analysis

and the reflection of farmers' perspectives and explain how external drivers connected with internal drivers or social norms and gender dynamics.

Chapter Eight is the conclusion, and it presents a summary of the manuscripts asserting how each contributed to the research. The contribution included mapping the conditions of the family farming and solidarity economy in the state of RN. It identifies issues and possibilities for the microregion and how the government, institutions, and researchers can influence these outcomes. The results also complement the existing literature on the role of governments, institutions, and research in developing sustainable food systems that consider gender dynamics, especially within this geographical area.

Research Contributions

Most of Brazil's publications on agriculture and farming, particularly in English, are on industrial farming and its ecological and social impact. The existing literature does not sufficiently cover sustainability in family farming, co-operatives, and the SSE movement in Brazil. The current literature about women's role in rural development in the region especially studies considering farmers' narratives, is exceptionally scarce.

Thus, this research contributes to the literature by exploring how family farming approaches to agriculture might represent a positive environmental response focusing on regeneration and adaptation. The narratives included in this study portray how the promotion of women's political representation can give them better access to their participation in policymaking processes. The study also brought experiential examples of how farmers might diversify their production cycles in response to the dry season to keep them economically sustainable year-round. This research also provides detailed suggestions to policymakers, farmers, and academics on food systems in the Northeast Region of Brazil on sustainability topics as they intersect with social norms and gender issues in the proposed context. The thesis provides the building blocks and details for the model grounded on the integrated praxis of womanism, agroecology, and solidarity at RXX.

Tackling policy has proved challenging when the need to generate actions capable of building and transforming productive structures is shown before the development stage. In this case, one of the challenges lies in the unique natural, socioeconomic environment for which literature is still insufficient. This study contributes by looking beyond the ecological and social impact of industrial farming and focusing on territorial development in an interdisciplinary way. This multidisciplinary approach to sustainability emphasizes the connectivity and interdependency of its elements instead of observing them in the typical disjointed manner common in the existing literature, where the social, economic, and environmental aspects are considered enclosed in their subjects. Sustainability elements of connectivity and interdependency, as well as how these elements connect with local food systems, can illustrate the challenges and opportunities needed to generate actions capable of building and transforming productive structures. Understanding these elements also requires consideration of the complexity of development from the economic, environmental, sociocultural, political-institutional, and gender dimensions.

Another contribution was the further elaboration of the model and framework presented by Allen and Prosperi (2016) that had built on studies by Turner et al. (2003), Ericksen (2007), and Ingram (2011). The model presented in this research provides unique and guiding suggestions on how food systems can integrate sustainability elements with community-based food systems' social norms and gender dynamics. The research also offers distinctive ways to present the usually disjoining aspects of sustainability described here in an integrated manner. This study aims to understand the multidimensional issues, potentializing better food systems outcomes.

2. INTERDISCIPLINARY LITERATURE

Food systems embody an extensive array of disciplines, and a comprehensive literature review of all disciplines involved in food systems would be an impractical task for one research project. However, to explore the makings of resilience in local food systems, an interdisciplinary look is necessary. The choice of interdisciplinarity comes with the challenge of selecting enough of each subject to understand the phenomenon to be studied. Thus, this study does not attempt an exhaustive review of each subject presented.

The literature presents the current debates in the global food systems as the problematization of the common larger context in the development of food systems worldwide, where both Brazilian agribusiness and family farming are present. It presents subjects involved in characterizing the relations between global to local food systems and sustainability. It also discusses themes and terms that surfaced from the research creation and data analysis. It includes the sociology of food, public policies in food systems, social solidarity economy and gender studies. In addition, the specific literature review regarding each chapter's objectives is presented within each article.

Sociology of Food

According to Tanaka, K. (2020), cooking and eating are preserved in multicultural societies. It makes food practices no longer the best natural selection stimulated through access, environment, and dietary desires. Rondeau (2020) states that the position of consumption is as much a social activity as it is physiological, both for a man and woman. Pangelinan (2021) states that the sociology of food has its roots in early sociologists, such as Durkheim's work on the division of labour in society which was particularly influential in the development of the sociology of food. Marx's work on the commodity fetishism of capitalism also significantly impacted the sociology of food, as it showed how economic and political forces shape the social relations of food production and consumption. The growth has been driven partly by the increasing importance of food in the public discourse and the rise of the food culture and global food industry.

The sociology of food is concerned with the social, political, economic, and philosophical aspects that impact eating patterns, including what people consume, when humans eat, how humans eat, and why people eat (Aktaş-Polat & Polat, 2020). Sociologists study human interaction patterns and the connections involving social structure and individual behaviours. Food sociology is concerned with the social organization of producing food, transmission, and intake, which may be considered a communal appetite. The collective amplifies food choices, as they can be expressed as political and economic choices. The sociology of food demonstrates that food is not merely biological or nutritional phenomenon but also a social one that can be understood by examining its numerous settings, from agriculture and production via preparation, commercialization, and distribution, as well as other elements of usage and waste (Boni, 2019). Usually, the sociology of food addresses the relationship between food and culture. This study problematizes the food system from the perspective of family farmers. Understanding the global food systems' past and present can help us predict or create possible futures. Thus, this literature addresses the global food systems, agribusiness, and family farming, then examine their relations to peasantry, labour and community as well as sustainability.

Globally, food has helped give rise to the liberalization of finance, consequently raising the flow of foreign direct investment between countries and regions. Things like biofuels have driven several significant investments in food chains. According to Amartya Sen, current food crises are less about the unavailability of food and more about the inability to purchase. The main question for sociologists concerns the mechanism of generation underpinning these issues. The shape generates incentives for actors and affects their capacities, ultimately dictating their behaviours (Tanaka, 2020). Actors inside the food practices are interdependent and may affect every differing incentive and capacity as they function. The standard overall performance of this practice, measured in expressions of sustainability, is the result of the intertwined behaviours that interact within food systems.

Globalization's rapid economic, demographic, and social developments resulted in changes in eating habits, exercise habits, and overall health. These developments promoted increased food intake outside the house and impacted the meal's quality, as traditional foods were replaced with manufactured goods. Regarding health and dietary composition, taste and nutritional qualities are the key factors in food selection in Northeast Brazil. According to studies, quality is an essential predictor of intake (Moura et al., 2020). Several factors contribute to a person's taste perception, such as colour, shape, texture, warmth, and lipid content. They all contribute to the sense of taste. The establishment, maintenance, and alteration of eating habits are based on the enjoyment of eating because of a combination of sensory elements. Bourdieu's Cultural Capital concerning Food Choices article explains a direct correlation between socioeconomic characteristics, such as money, education, and food expenses, that significantly influence individuals' motivations and eating choices (Kamphuis et al. 2015). Although the time of food decision-making is unique, it is crucial to remember that food choices are habit-forming and can be significantly influenced by the market, social norms and, lately, social media, and these resulting food choices, in turn, affect the public health and the environment.

Food choices is complex subject because is a dynamic process that changes throughout people's lives for various reasons, such as dietary needs, or preference, price, access, culture, marketing influence, health and others. Food choices are also expressed collectively. Food democracy is the idea of making a public decision to increase access and the collective benefit from a common food system. Concerned citizens have the power to determine or influence food policies and practices locally, regionally, nationally, and globally (Larsen, 2020). Thus, communities and individuals engage in local food production and consumption, making individual and collective food choices leading to participatory food democracy. Therefore, family farmers must have secure better tenure rights and pursue equal access to resources and productive assets to serve as the primary change agents in their food systems (Tanaka, 2020). Long-term development, responsible investment, eradicating poverty, and food insecurity for family farmers can all be facilitated by coherent legal, policy, and organizational frameworks for good tenure governance. These facilitate, promote, and protect tenure rights while recognizing legitimate tenure rights, including legitimate customary tenure rights that are not currently protected by law (Herrera Ortuño, 2021). Farmers and especially young farmers, worry about their ability to own property because resource access, ownership, and management discrimination prevent generational transitions in agriculture, fishery, and forestry.

Legislation and institutional support play an important role in the collective wellbeing of food systems. They can enable family farmers to contribute to food security by expanding the

offering of nourishing and healthy foods. Adding value is another critical area in developing food systems, fostering conditions to make peasantry-processed products more broadly available and accessible (Cherry, 2021). Public policies can promote micro-industry development in rural areas. Decision-makers can intervene along supply chains to lower nutrient-dense food's transaction and distribution of costs, particularly for those growing fruit and vegetables, making nutrient-dense food accessible to consumers at an affordable price (Pangelinan, 2021). At the same time, ensuring producers have access to markets at fair prices. In-kind or cash transfer programs are one way that decision-makers can help family farmers be more resilient to economic distress by reducing the impact of pandemic-style shocks or internationally triggered economic crises. Family farming programs must also enhance family farmers' lives and advance their contribution to urgent global concerns. A legal definition and recognition of what family farming is can contribute to giving farmers access to programs that benefit formal entities. Family farmers' active participation in legislative and policy-making processes facilitates accuracy, ownership, and sustainability (Larsen, 2020). Legislation and policies will better suit farmers' urgent and long-term needs while contributing to their community's ability to feed themselves. Policies can also influence gender dynamics if they emphasize the practical inclusion of women and the youth.

The ability to make good food choices is influenced not only by the surroundings in which a person or group lives. In this context, certain places that sell ready-to-eat meals for consumption outside the home may help or hinder the inclusion of healthier options. While individuals bear a high level of responsibility for dietary choices, the Food Guideline (FG) for the Northeast Brazilian general population recognizes that government policies and legal actions are required to create an environment more conducive to good nutrition and ensuring food and nutritional security (Oliveira & Santos, 2020). In contexts such as marketplaces, the familiarity of the preparations presented in food establishments might help increase meal intake. Taste is one of the least adjustable criteria in the food setting since it is the primary aspect that contributes to eating pleasure. The intake of meals in this location is inspired by the availability of traditional dishes and the distinctive taste of the preparations. Food purchases account for the lion's share of the budgets of the poorest households and are particularly susceptible to changes in case of variation in the prices of food goods.

Individual socioeconomic variables influence motives and food choices by restricting, unbalancing, and interfering with the food choice process's objectives. Lack of engagement with environmental concerns encourages public consumption and promotes negative environmental consequences, directly influencing the population's well-being (Melo et al., 2021). Thus, extensive environmental consciousness work by public health experts is vital to effect change in both the development of creativity and in the attitudes of people and society toward their surroundings. The Brazilian FG not only advises against eating ultra-processed foods to prevent their potential health risks, but the guide also acknowledges the environmental impact of the production and distribution of ultra-processed foods (Ministerio da Saude). It considers the high waste generated by packaging disposal, the encouragement of monocultures, the excessive use of pesticides and water, and the high-power consumption and pollution generated during transportation. Thus, the portrait of ultra-processed food brought by the FG could serve as a resource for medical professionals in advocating for healthier food choices. However, how mainstream is the Brazilian FG in reaching and influencing the population's food choices and conceptualizing food systems?

Most of the nutrient-dense local staples are produced by peasants and family farmers, even though agribusiness owns most of the arable land in practically every country around the globe. Family farmers control less than half of the world's farmland. The most recent agricultural census in Brazil is a typical illustration (Census, 2017). Tanaka (2020) states that peasants and family farmers own just 24.3% of farmland. Still, they account for 84.4% of all farms and employ three times as many people as agribusiness. The peasantry is rooted in the region where they and their ancestors have farmed for many generations and where their future descendants are expected to do the same. On the other hand, agribusiness practices are less connected to local development. Global outsourcing corporations may shift their manufacturing cost worldwide without having ties to any location. They lack the motivation to maintain, improve, and develop soil fertility. Instead, they take as much as they can quickly to maximize their profits, and when their output reaches its peak and starts to decline due to soil deterioration, they leave a given location for another (Pangelinan, 2021). The culture of slash and burn has high social, economic, and environmental costs. They depart, outsource work to a different location, and leave divested local economies and agroecosystems in their wake.

Sustainable Food Systems and Public policies

The Food and Agriculture Organization defines food systems as the complete set of actors and their interconnected value-adding operations associated with the manufacture, preparation, circulation, intake, and disposal of food products derived from agriculture, forestry, and components of the broader economic, societal, and ecological issues in which they exist (de Carvalho et al., 2021). This implies that food systems encompass the entire food cycle, from production to disposal, including several subsystems and stakeholders. Sustainable food systems typically provide social, financial, and ecological foundations for future agricultural production. The UN's Sustainable Development Goals (SDGs) contain 17 targets aimed at eradicating hunger, promoting agricultural production, and improving nutrition (de Carvalho et al., 2021). Attaining these objectives is a challenging task that requires special efforts from various nations, states, and cities. However, the majority, if not all, will be far more difficult to attain without establishing the basis of sustainable food systems in these diverse settings.

The public policies that can support or impair the development of food systems are highly influenced by external and internal drivers, such as the global market, consumer preferences, ideologies, and institutional or governmental support. National guidelines are an example of a multifaceted influence on food systems as they have as objectives to guide society to follow healthy eating and to the prevention of all forms of malnutrition as well as health promotion, to be followed by cross-sectoral policies (Berchin et al., 2019). National guidelines can serve as an official framework for other public policies related to food. For instance, public procuring programs are expected to be based on the linkages between the health, agricultural and educational sectors described in local or national guidelines (Borelli et al., 2020). The Brazilian school feeding programs offer complete, safe, and nutritious food to children and young people in public schools. A federal policy determines that a minimum of thirty percent should come from small and medium-sized farmers. These programs encourage fruit and vegetable consumption and provide direct marketing opportunities for family farmers. Multifaceted policies can increase people's access to fruits and vegetables, potentially cultivating healthy habits and promoting farmers' livelihood improvement.

Multifaced policies can also promote agroecology by advocating for the manufacturing structures that integrate agriculture into ecology and feminism, which is perceived as eco-solution toward the SDGs (Herrera Ortuño, 2021). Multifaced policies implemented in the early 1990s in semi-arid regions of Northeast Brazil included women's empowerment and opportunities for improvement in food production. Women farmers' interactions with community development agencies, professionals, clients, and non-profit international aid agencies, encouraged a movement that changed the societal fabric in some rural communities. Felix (2009) concluded that the community organization supported women to make better investments and developed their community food production.

This food security policy, therefore, targeted the promotion of feminism to increase farming opportunities. Focusing on the appreciation of collective food security and comprehending the development of spaces for social and political participation of women, as well as promoting the diversification of women's roles in associations, forums, and informal agencies, contributed to the success of their agricultural initiatives (Pereira, 2016). The farmer's appreciation of the land, their surroundings, and recently gender equality in the semi-arid regions offer opportunities for the development of standards for improvement as farmers engage in the mobilization of small manufacturers and development agencies to create a network for partnership marketing (Felix, 2009). The inspiration of the various social and political actors concerned led to the creation of communities that made possible the direct advertising and market of food products produced inside the semi-arid regions with high standards and integrated into the local and regional economy (Feil et al. 2020). The result seen in this micro-region was sparked by an enabling political environment. Therefore, fair, transparent, and science-based trade rules on food that adequately reward all links in the production chain are essential to improving the global food system, especially through integrating local food systems reach into larger scopes

There are some initiatives underway to develop indicators to track the sustainability of food systems, for example, studies that quantify the environmental effect of dietary consumption and others that assess the environmental and health implications of diets in several regions of the world (Tom et al., 2016; and Wang et al., 2020). These assessments, however, focus only on a few components of food systems, including carbon footprint, energy consumption, and water usage. A novel approach to this problem is to view it as a complex, dynamic system with numerous players and a high degree of interdependence between activities. This method seeks to solve some of the shortcomings of several existing techniques by viewing food systems holistically and interdependently to enhance diet, farmers' welfare, and the ecosystem. With this view in order, multiple attempts have been made to develop comprehensive indicators for assessing the sustainability of food systems. For instance, Béné et al. (2019) provided an international map of food system sustainability based on a four-dimensional index (social, ecologic, financial, as well as food and nutrition) and 27 indicators; and Seconda et al. (2019) established a distinct index with four aspects and nine multifaceted individual parameters. Additionally, some writers are building paradigms and concepts for sustainable food systems and diets to assist legislators in comprehending and promoting appropriate policies and actions (Mayton et al., 2020).

These metrics and paradigms included a variety of dimensions and variables, indicating that food systems are sophisticated and encompass a variety of facets, which demands an interdisciplinary look. They usually compare national estimates of food systems at the world or state level. However, these metrics cannot be used in sub-national settings since many metrics lack national or state-level information. Additionally, huge countries, including Brazil, the United States, China, and India, have radically distinct food systems within their territories. Thus, local situations must be investigated to comprehend how food systems operate at the state and municipal levels and to design local responses to improve and achieve more sustainable food systems. Brazil is a large nation encompassing the most diverse ecosystems in the world, with a population of 211 million organized into 26 states and five zones, such as the Northeast (de Carvalho et al., 2021). Each area has its economic condition, environmental concerns, and culinary habits. Notwithstanding being among the global highest food producers, Brazil lacks a framework for sustainable food systems and criteria for articulating sustainable food production throughout the nation's regions (de Carvalho et al., 2021). Hence, this gap calls for a need to revisit food systems existing conceptual framework and assess socioeconomic and ecological factors in the country, particularly in Northeast Brazil, where poverty hits harder.

In democratic societies, governance mechanisms increasingly involve non-governmental players on several levels and official institutions (Aktaş-Polat & Polat, 2020). A critical component of governance is the formulation of policies and plans, their implementation and monitoring, and responsive assessment to address shortcomings (Romano & Akhmouch, 2019), and in this instance, processes of sustainable land management. Effective natural resource management attempts to accomplish, among other things, an equal and environmentally sustainable allocation and utilization of resources, including water. This means ensuring equal access to water for all socioeconomic classes via open decision-making and a system for equitable involvement. This requires establishing an institutional framework with the necessary infrastructure and legal capability. Environmental governance bridges the political and academic worlds by integrating necessary studies on sustainability and ecological justice (Rodorff et al., 2019). Rodorff et al. (2019) underline the critical role of effective governance in achieving sustainable development and alleviating poverty.

At the end of the military regime, Brazil saw a period of emphasis on food security pressed by an economic crisis, public anxiety, and peasants' rights activism. Brazil has been described as a governance experiment, owning many government-led inventions, social movements and abundant natural resources that have piqued global attention and drawn international investment (Rodorff et al., 2019). These initiatives demonstrate the importance of governmental and institutional support.

Villamayor-Tomas et al. (2015) identified challenges regarding justice, equity, and openness in water–energy–food nexus choices. Rodorff et al. (2019), discussed such issues as the utility of water in irrigated agriculture. Numerous writers have addressed the topic of good governance, yet the difficulty persists in turning theory into reality (Rodorff et al., 2019). In 2009, the State of Rio de Janeiro faced many challenges, including low agricultural productivity, smaller market connections, degraded natural resources, rural poverty, insufficient ability to react to market requirements, inadequate and untenable farming techniques, and inadequate infrastructure. Additionally, significant landslides transpired in the Serrana area of Rio de Janeiro state in 2011. As a result, the national government sought help from the World Bank in offering

humanitarian support to help impacted peasant farmers resume agricultural output. This demonstrates how states can lead initiatives to solve their regional issues.

In 1993, the municipal government of Belo Horizonte, the fourth largest city in Brazil, introduced a program to reduce food insecurity in its urban settings. This complex plan was rooted in human rights; Rocha (2001, p.37) explains that it was based on “the notion of food security, interpreted as a principle: that all citizens have the right to adequate quantity and quality of food throughout their lives, and that it is the duty of governments to guarantee this right.” The program had three lines of action, the first aimed at supplementing the food needs of poor families; the second focused on food trade by engaging private suppliers in increasing food access to food deserts in the city previously neglected by the food market business; the third aimed at promoting the development of urban agriculture and small producers from the surrounding areas by offering technical and financial incentives (Rocha, 2001). Some of the projects described by Rocha involve the distribution of enriched flour through health clinics; the improvement of school meals by increasing their nutritional density funded by the Federal school meals programs; Popular Restaurants that provide nutritious meals at affordable prices in central areas; Popular Food Baskets consisting in twenty-two basic food items sold at subsidized prices by trucks at low-income areas; Community gardens; and Agroecological educational centers. The author emphasizes that an integrating approach is a key element of in shaping food security policies.

However, such State initiatives are more common and well documented in Brazil’s South and Southeast regions than in the Northeast. Another observation about experiences such as the Belo Horizonte case is that they took place during the beginning of an enabling political environment in the country where Federal funds and popular pressures were present, and the leadership at Belo Horizonte promptly took advantage of the moment. Mendell (2009) appoints leadership as one of three pillars in enabling the success of SSE, followed by institutional and governmental support and the SSE initiatives. Rocha (2001) explores the reasons why more programs to tackle food security issues, which is endemic to Brazil, were not successfully implemented during the same period. Rocha asks, how much of the success is owing to local leadership and aptitude? However, the author also ponders that in some cities or municipalities in Brazil, the existing institutional environment might not have been as enabling. The expertise and other resources necessary to develop such innovative policies and initiatives might not have been readily available in small municipalities, especially in more isolated microregions.

The *Fome Zero* [Zero hunger] was a bold and complex federal program; aimed at promoting actions to improve food and nutrition security for Brazilians by tackling the structural causes of poverty. The initiatives involved all ministries and the three spheres of government, federal, state, and municipal, plus the participation of society (Agencia Brasil, 2003). The program contributed to a decade of rural development and enabled policies for developing the family farming and the SSE sectors, reaching microregions in rural Brazil. The program was multifaceted, with actions focused on infrastructure and specific actions in different areas such as health, education, economic development, and emergency programs. Although many of the Zero Hunger programs were later recognized internationally as food security model policies, such as the Food and Nutrition Education Program; the Strengthening of family farming actions; the Popular Restaurants Program; and the Food Card Program; their implementation received a lot of

criticism and political challenges nationally, which minimized its positive impacts. In recent years many of the programs suffered major cuts or were terminated.

In 2004, Yasbek (2004, p.106) predicted the risks faced by the Program Zero Hunger, exploring two questions, first, the challenges in the management of a great, decentralized and multifaceted program nationwide; and second, the social and political meaning of such programs in the face of what she called the re-philanthropizing of the Brazilian social condition, that can become obtrusive with the depoliticization of social policy. Ananias, former mayor of Belo Horizonte, participated in the program's direction. The proposal resembles the urban food security program implemented in Belo Horizonte in 1993; the Zero Hunger program also sought to combine structural, specific, and local policies with an integrated approach. However, on a much bigger scale and to address food security beyond urban settings. Yasbek considers the integration that connected the federal agencies involved in the actions to be a positive aspect of the Program. However, Yasbek states that despite this ambition, the focus of the implementation and the main effect on public perception was the Food Card and the Family Bursary Programs, which are specific policies. This factor, according to Yasbek (2004), failed to demonstrate clear achievements of the integrated program. The simplified perception of the program, in her opinion, had a strong humanitarian connotation without well-defined references to its basis in human rights and lacked association with human development.

As stated by de Freitas Coca & Júnior (2018), we can encourage the transition to such systems if we can all agree that small farm agroecological systems are more productive and more resilient to climate change. Brazil's experience shows that traditional top-down research and extension systems, as well as approaches used by many governments and non-governmental organizations, fall short of assisting small farmers in making the transition. Agroecology systems necessitate farmer ingenuity; the best techniques are those farmers lead in discovering, developing, and disseminating techniques. Good agrarian reform and a general shift away from policies hostile to small farmers and their organizations must all be included in such policies Souza et al. (2020). Agriculture research and extension systems should be reoriented to assist. Farmer-to-farmer innovation and sharing in the field, overseen by farmer groups, is the foundation for expanding agroecology.

Family Farming and the Social Solidarity Economy in Latin America

The SSE movement has been growing in Brazil in the past twenty years, establishing itself as an academic subject. The SSE incubators influenced this establishment process by assisting in the stimulation of entrepreneurial capacity and contributing to regional sustainable development. Incubators have been established in certain Brazilian universities to assist and strengthen the SSE. Its framework integrates academic extension, research, and learning to enhance social entrepreneurship incubation (Santos & Santos, 2020). It is important to understand the conceptual and methodological advancements connected to the challenges posed by the consolidation of solidarity entrepreneurs and the establishment of networks among initiatives for solidarity economics in their respective regions (Otsuki & Castro, 2020). Research aimed at understanding the processes that create enabling environment for the success of SSE can help pinpoint challenges and discuss methods for enhancing the conceptual framework to advise policymakers on future programs and policies.

Another governmental initiative that contributed to the development of SSE in Brazil was the initiative called *Rede de Gestores de Políticas Públicas de Economia Solidária* [Network of Public Policy Makers] for the development of SSE, which was created in Brasília in 2003, and emerged from the need for articulation and training of public servants. The purpose was to increasingly expand the development of adequate tools for SSE, as well as to stimulate and strengthen the organization and social participation of the largely excluded segment in public policy decisions

According to Gaiger (2011), SSE seeks to generate social profits and break from the association of the SSE with dependency on social assistance. In Gaiger's view, the SSE financial condition is regarded as a multidimensional issue, that facilitates a complete response interlinked with different areas of involvement, permitting that the excluded social initiatives be integrated into the economy. In keeping with Otsuki & Castro (2020), the goal of the SSE is to combine resources and obtain admission to public bidding in the sectors of supplementary benefit, sanitation, energy delivery, and integration into regimes. Many efforts regarding the appearance of recent programs had the objective of producing social profits, and broadening money transfer programs in partnership with states, municipalities, public and private actors, and civil society organizations (Gutberlet et al., 2020). These efforts prompted the SSE growth in Brazilian cooperatives and is an expression of development in the family farming sector (Santos et al., 2019).

SSE development promotes national prosperity, individual and collective self-reliance, and the accomplishment of internationally agreed-on development goals, such as the Millennium Development Goals, as recommended in the Brazilian cooperation strategy of the International Labor Organization (Kawano, 2020). Therefore, the SSE hold a crucial role since it safeguards the ability to produce work, income, and employment. Cooperatives, associations, and social enterprises are just a few examples of the types of businesses that solidarity-based economies can use. These organizations have already demonstrated in several nations that they can generate wealth and assist in the socio-economic integration of a wide range of people previously excluded, including young women and underprivileged groups, as expressed by Esteves et al. (2020). Additionally, the social and solidarity economy may influence local and territorial development based on its political participation to rethink the current development paradigm toward more inclusive, sustainable development.

The mapping of social solidarity economy (SSE) enterprises from IBGE (2009) revealed that the Northeast region accounts for 40% of the country's SSE organizations. In addition, the study shows that most of these organizations are in rural areas, suggesting an SSE as an alternative to struggling communities. SSE is also the region's main commercialization system for family agriculture (IBGE, 2009). Latin America has been one of the world's largest agricultural areas since the turn of the century due to the natural conditions of abundant sunlight and the available natural resources such as water, and vast amounts of arable land continually expanded by deforestation. Argentina and Brazil have seen considerable increases in soybean, maize, and meat product output and exports. Since their colonial era, Latin American nations' economies also have developed a dependency on exports (Kay, 2019). Although Brazil is one of the world's largest food producers of commodity crops, such as soybeans, maize, sugar, coffee, and meat products (Statista, 2022), the focus is the quantity and bulk economic value. Brazil's long-standing privileged position in agriculture seems to be set in the contradictory notion that

these natural resources are endless. Guimarães describes the slash-and-burn culture as he explains that since the colonization period, the development of large-scale agriculture considers the Brazilian natural resources of forests, land, and water were unlimited. Thus, the land is exploited, abandoned, and replaced (Guimarães, 1991, p. 86).

On the other hand, Brazil and Latin America are also one of the world's most active agricultural areas in terms of social movements and innovative strategies for family farming development. One of them is known as the Public Procurement from Family Farming program, which links the public sector's demand for food products destined for school feeding programs with the supply of local family farming producers (Cervantes-Zapana et al., 2020, p. 2). Cervantes-Zapana also asserts how several governments in Latin America attempted to alleviate the disparity within agricultural development and the vulnerability of family farming throughout the twentieth century via agrarian reforms and the creation of innovative solutions. They seized large-scale farms and redistributed them to small-scale farmers. However, redistribution alone could not alleviate the rural poverty issue since the rural sector lacked people and physical resources. At the turn of the twentieth century, poverty alleviation and the growth of family farmers were entrusted to the free market mechanisms. This tendency shifted in the twenty-first century, due to many circumstances, there was a resurgence of interest in family farming (Sabourin et al., 2020). One is family farmers' poverty tenacity. By the turn of the twenty-first century, it was evident that free-market mechanisms could not alleviate rural poverty (Shimizu, 2019, p. 90). Agriculture and household farming have garnered legislators' interest in revitalizing rural economies. Additionally, during the 2008 Food Shortage, household farming was thrust into the limelight for food security concerns. They were regarded as significant players in providing food products for home markets.

In Latin America, the solidarity economy's rise in the 1980s provided continuity and fresh support for a long and illustrious background of widespread solidarity (Shimizu, 2019, p. 90). The SSE has distant precedents throughout the continent, ranging from native pre-Columbian traditions to communal forms established by emancipated slaves. The continent's diverse area encompasses regions where families, particularly original inhabitants, maintain their ways of life and keep the capitalist job market at bay, even though this option often comes at the cost of cultural isolation and widespread poverty. For example, in Brazil, the SSE has been progressively growing since the 1980s, with a long history of deeply ingrained, if not always, solidarity-oriented principles (Gaiger, 2017, p. 2). Not-for-profit and self-managed initiatives are indelible markers of the nation's solidarity economy. One reason contributing to the rising number of initiatives noticed in recent times is the structural problems afflicting the Brazilian job market, the effects of which have been exacerbated by the State's departure as a supporting agent. Another significant factor is the constant dedication of social movements, labour groups, and citizen groups to build and nurture mutual aid and cooperation policies. Many community-based projects have been growing in rural neighbourhoods for an extended period, using SSE principles that have expanded and received wider attention.

In Brazil, family farmers faced adversity and battled to exist due to the underdeveloped local organizations and infrastructure (Niederle et al., 2019, p. 710). Family farmers had previously encountered social marginalization rooted in deep prejudice toward agriculture and the rural economy. Legislators overall had a bad view of family farming and did not prioritize its promotion. Rather, they concentrated their efforts on urban and industrial growth. Even though

the government implemented various initiatives to encourage agriculture, these regulations did not apply to family farmers (Sabourin et al., 2020). This scenario changed in 1985 when a civilian administration replaced the dictatorial military administration. Rural labourers were provided social security rights under the 1988 Constitution. Collective action by the National Confederation of Agriculture Laborers and landless labourers began in earnest in the early 1990s (Shimizu, 2019, p.90). In 1995, the government established the Initiative to Enhance Household Farming (Shimizu, 2019, p. 91).

A new Ministry of Agrarian Development (MDA) was formed in addition to the Ministry of Agriculture and Supply (MAPA). The creation of the MDA was a hard-fought achievement of representation for the family farming sector of agriculture. It served as an umbrella to house family farming and SSE institutional development support and political representation. However, the MDA was terminated as part of a series of reforms that resulted from the recent political crisis in the Brazilian Federal Government. President Dilma Rousseff was removed from the Brazilian presidency by an impeachment process. The new administration implemented sharp changes in direction, including large budgetary deviations. These changes significantly affected family farming and the SSE.

Gender studies: Women initiatives and Womanism

In the context of agriculture and food systems, gender studies seek to understand the widely different roles played by men and women, which are also affected by regionality, class and race. Some research focuses on identifying women's contributions to farming and economic operations. Others might focus on women's rights or farm women's expected duties may vary depending on places where social and economic development interacts with agriculture. Quisumbing et al. (2014) state that gender can shape the accessibility to productive resources and opportunities, with women fairing worse than men in accessing various assets, inputs, and services in many contexts. Gender differences in opportunities, in turn, can shape agriculture as a sector. There are various emerging branches of feminist theories exploring gender in food systems and agriculture, and they are rapidly changing. Many branches of feminist theories present some overlapping. Their theoretic base also went through a process of critical tensions in the past three decades where both feminism and ecofeminist literature regress, advance, and diversify after a period of a firestorm of backlash against their insensitivity to race and blindness towards exclusion (Gaard, p. 40, 2011). For this reason, currently, the womanist branch seems more able to represent the participants in this research.

The contributions of women in farming are widely acknowledged in the literature and in empirical work done worldwide, especially related to their contribution to the labour force involved in agricultural production, as they take jobs in agribusiness while also working in their home gardens and the caring work related to keeping animals and tending to family. In Brazil they also dominate the work in the production of added-value products by transforming their surplus (Census, 2017). However, women fall behind regarding fair compensation, recognition of their unpaid work and lack of decision-making power as farmers. The growth of contract farming and the development of contemporary supply networks for industrialized high-value agricultural products were addressed by Novovic (2021), the author stated women's labour in agriculture, primarily as farmers, are more likely to be compensated on other farms or when they work as

labourers rather than on their family farms (Novovic, 2021).

There are diverse examples of women-led initiatives around the world that are responding to issues similar to the ones encountered in Brazil. Inequal labour responsibilities, lack of decision-making power, especially regarding monetary decisions, and unequal access to resources and knowledge, among other issues. Policies and institutions can help shape changes to narrow the inequality gender gap. These initiatives also are promoted by enabling public policies. One of the major conflicts the Brazilian government is facing is related to the expansion of infrastructure spending to provide women and families with public service to allow them large participation in economic activities.

Women's empowerment often occurs through entrepreneurship and self-employment. One way to empower women is the implementation of policies, such as the facilitation of microcredit, employed to create new opportunities. For women engaged in various farming activities, like backyard chicken farming, this kind of policy can offer start-up funds to change women's realities, offering a steady income to support their families and business operations (Benítez et al., 2021). Additionally, it improves decision-making emancipation and socio-economic development in rural communities. Farming plays a significant role in the local economy. These policies can help improve farmers' livelihoods while keeping food costs low. Thus, ensuring food security by promoting increased production of local food systems.

According to research on Emirati Women Entrepreneurs in the United Arab Emirates, women entrepreneurs in the Gulf region significantly contribute to their nations' economies and reputations (Ennis, 2019). Women entrepreneurs are essential to women's empowerment and to their participation in worthwhile endeavours. To help empower women in their entrepreneurial endeavours, policymakers were urged to consider the natural environment when making decisions. Zayadin et al. (2020) highlighted the participatory process in the development and implementation of policies in the region (Zayadin et al., 2020). Furthermore, understanding the connection between women's economic empowerment, business, and farming can offer more significant insights into a country's economy (Motta, 2021).

Womanism

Ecofeminism can be viewed as a section of feminism that presents a connexion between systems of oppression usually associated with women. It was born of the association of feminism with various social movements such as social justice and environmental. The ecofeminist understanding is that the patriarchal relations of oppression and domination over women extend its reach beyond human over-human relations. Comparing the oppressive relationship between men and women relations with the subordination of ecosystems and nature itself by patriarch models for the dominance of resources (Rosendo & Kuhnen ,2019).

The oversimplified view of ecofeminism puts women and the environment dominance as a universal category, as did feminism with white women's rights painted as all women's rights at one point. However, as Agarwal (1992) highlighted, the concentrated appropriation of natural resources followed by environmental degradation was and still is a process reserved for a select few. This dominant minority had specific class-gender and locational implications and could not

address women's issues related to agriculture in a universal way. Contemporary ecofeminism is evolving beyond its initial essentialist ideology. It is more committed to addressing issues of class and ethnicity, but that are remaining conflicts and gaps between theorists in terms of its role in representation, especially regarding minority groups such as diverse family farmers segment in developing countries.

Womanism theories have yet to flourish in the context of agriculture and food systems. However, the theory's connection with a family-centered pursuit of well-being, as well as the focus on the exploration of connections between women in their places and cultural identities (Barry & Grady, 2019). Even if in different contexts, womanism offers a rich representation framework for family farmers in diverse communities. Womanism builds on the understanding of oppression described in ecofeminism, where patriarchy dominates both women, in this case, black and indigenous women included, the natural and the economic resources. This dominance also shapes an institutional environment that is biased against women farmers. Womanism, described by Pérez (2009) aims to explore ways to integrate women in their local and regional economies.

3. RESEARCH DESIGN

The Individualized Program at Concordia University can house unique research designs. This research involves an interdisciplinary study that uses participatory approaches. It is also in a manuscript thesis format.

Interdisciplinarity

Looking into food systems from interdisciplinary lenses is a unique opportunity to explore the links and interactions between the subjects involved. However, it's a challenge because food encompasses such a wide variety of subjects and sciences that it makes it exorbitant to exhaust or deliver a comprehensive literature review as a Ph.D. project because each of the subjects is large enough to be a study in itself. I believe it is for this reason that studies that investigate the connections and relationships between aspects of sustainability across different disciplines are not common. This study does not attempt a comprehensive literature review of each subject. The choice of interdisciplinarity has to tackle the challenge of selecting enough of each discipline to understand the phenomenon to be studied.

Participatory approach

The research design used mixed qualitative methods, aiming to create solutions to practical problems (Kelly, 2005). PAR is a research approach that appreciates participants and includes co-creation processes in defining the research focus and objectives. Co-creation in this case study meant adjusting initial expectations and incorporating changes in research focus to honour participants' inputs. The scope went beyond the aspects of the sociology of food and sustainable community development initially anticipated. After the collection of data, some unexpected questions plead to be explored. The first was about what farmers called the “image of food systems” and how it affects individual and collective food choices. The other challenge was related to incorporating gender dynamics in the analysis as the subject appeared everywhere in the data as a facilitator of attaining collective goals. Thus, the path to subsequent research questions was data-driven.

The research design used mixed qualitative methods, including principles of participatory action research (PAR), which consists of community-based action research in which researchers and participants collaborate in the steps of the study (Kelly, 2005). In this case, the family farmers, community developers, and funding agents who participated identified the focus of the research, associated problems, and how the study results should be used. By including communities in the elucidation and problem-solving of their challenges, action research studies the effects of action and praxis, seeking ways to promote change to improve the praxis of the participants in a cyclic manner (Streubert & Carpenter, 2002). Thus, the results of PARs can provide an approach to more tightly integrating research in developing and disseminating knowledge that is more relevant and easily applicable to the people involved in research projects and might better guide specific or local public policies.

This study focused on the subjective nature of human experience in the praxis of women in family farming in the Northeast Region of Brazil. The recent literature on PAR has shown an

increasing interest in PAR applications in community development. The PAR approach is rooted in the Northeast Region of Brazil, where Paulo Freire first used what today is known as PAR in the early 1960s (Brandão, 2015). Freire successfully developed a 40-hour course to teach literacy to 300 rural workers who otherwise would not have had access to basic education and had their social participation limited by illiteracy. Freire used their socio-economic context and contributions to build the vocabulary for the program with participants using local resources.

In Spain, a group of researchers named Guzmán, López, Román, and Alonso (2013) applied PAR with local farmers, social organization groups, and management professionals to design and implement an approach to promote capacity-building management and organization in farming-related production. In the Andes region, a project that started with how researchers could help small-scale farmers reduce poverty became a PAR project focused on a marketing network approach that later evolved to include farmers from the Andes regions of Ecuador, Bolivia, and Peru (Devaux, 2007). The approach significantly helped farmers develop market niches adding value to potatoes and promoting food processing to offer ready-to-eat potato snacks in branded packages. James and Epp (2007) discuss using PAR to resolve complex adaptive issues. They define it as situations in which people find themselves in a problematic state or place, creating tensions between an ideal situation and their reality. PAR involves a straightforward collaborative design and implementation intended to understand a group of people while proposing changes to their conditions. PAR is a practical approach for improving a group's desired conditions in community development since it works in continuous cycles. If the first cycle does not produce the results expected, the group can reflect and reshape the plan and actions until the desired changes can be achieved.

Participants and data collection

The study used purposive sampling as samples in qualitative research are small to support the depth of case-oriented analysis essential to this inquiry (Sandelowski, 1996; Vasileiou et al., 2018). Purposive sampling means selecting the participant's capacity to provide richly textured information and pragmatic considerations in narratives. There were twenty-five participants, of the total of participants, nineteen were farmers, making the majority, as their views were essential to the research. One funding agent, two community development agents, involved with two cooperatives the Xique-Xique Network and the CECAFES, and three academics working in the State University located in Mossoro and the Federal Institute located in Mossoro and Natal. All participants lived within the state of RN, and all farmers lived outside of the capital city. Two of the nineteen farmers identified as male the remaining farmers identified as women. The in-person interviews and focus groups were conducted in 2017 between May and August. Posterior clarification and discussions were carried out online between participants and the researcher between 2017 and 2019. The interviews and focus groups lasted between thirty minutes and two hours.

The selection of the Xique-Xique Network was motivated by the fact that they are one of the region's most successful and long-enduring cooperatives of small-family farmers in the region. They have shown continuity and development for over 20 years now. And in the SSE, that is an achievement. Its feminist characteristics also drew attention because it is rather

uncommon in the area. The RXX initiative was founded and is led by women. The CECAFES is the cooperative responsible for RN's primary public farmers' market administration.

Manuscript format

In a manuscript format, the main objective of the thesis is distributed between the articles. For publication purposes, each manuscript had its own questions, methods, and conclusion. The different manuscripts answered the minor research questions in the path to achieving the main research objectives. Below is a brief summary of the chapter's intentions to present the path to the main objectives.

The Mapping chapter was where the farmers brought the issues and strengths within their experiences. It was also when the research objectives were developed, and some research questions were adjusted. After the mapping, the researcher discussed preliminary results with the participant farmers in secondary interviews and focus groups. From the mapping, two main directions surfaced: the role of institutions and the conceptualization of food. The next chapter explored the role of institutions which is a complex topic that permeates many aspects, from local to international spheres. Showing that institutions can support or obstruct family farming and SSE development. The "Google it" chapter further investigated the conceptualization of food systems and how it affects both individual and collective food choices. The Gender Dynamics chapter was not initially anticipated and resulted from the initial data analyses. By revisiting the data, it was possible to infer that much of their resilience and adaptability were facilitated by their ability to successfully rearrange their gender dynamics in solidarity to enable resilience and sustainability.

4. MAPPING THE CURRENT CONDITION OF SOLIDARITY ECONOMY AND FAMILY FARMING IN RN, THE NORTHEAST REGION OF BRAZIL

Published Journal manuscript: Dantas, M., & Ikeda, S. (2017). Mapping the Current Condition of Solidarity Economy and Family Farming in RN, Northeast of Brazil. *European Journal of Sustainable Development*, 6, 3, 1-10 ISSN: 2239-5938 Doi: 10.14207/ejsd.2017.v6n3p

This paper is part of a broader study exploring how participatory action research and institutional ethnography can contribute to developing sustainable food systems models and better the living conditions of family farmers. The study focused on the Xique-Xique Network and CECAFES farmer's market. This preliminary work analyzes the solidarity economy and family farming in Brazil and the Rio Grande do Norte. Thus, the inquiry driving this research revolves around exploring the concepts and contexts that make the current standing of the social solidarity economy SSE and family farming in Brazil.

The research brings a bibliographic historical account of the development of SSE and food systems in Brazil, positioning its place in the larger context of the global food system. Then, it analyses the effects and influences this larger context can have on the experiences of family farmers in the Rio Grande do Norte highlighting within their experiences the observed role of institutional spaces and support.

A Historical Context on The Social Solidarity Economy and The Development of Food Systems institutional support in Brazil

The terms social economy and solidarity economy has been present in the academic and political sphere for some time now. The Solidarity Economy has a more decidedly systemic, transformative, non-capitalist agenda. While the Social Economy can be “a sector of the economy that may or may not be part of a transformative, post-capitalist agenda, depending on whom you are talking to” (Poirier, 2014, p.11). The definitions are similar, but the limitations and the scope of their coverage differ. Different forms and expressions can be found in different areas of the world and can be traced back to ancient times. The history of the different expressions of SSE is important for our understanding of its regional development. In Brazil, the theoretical expression and the activism are more aligned with the Solidarity Economy concept in terms of the substitutive intent of its agenda. Its practice, however, is severely impaired by its interactions with capitalism and resembles the Solidarity Economy expressions as the sector that responds to hardship caused by crises affecting capital economies and the job market.

For the scope of this study, the historical development of the terminology is not the focus. Thus, the term Social Solidarity Economy SSE, disseminated by the *Réseau Intercontinental de Promotion de l'Economie Sociale et Solidaire* (RIPESS), offers the concept of Social Solidarity Economy SSE, without the “and” in-between and represents Social and Solidarity-based economies and movements, the absence of the “and” in-between emphasize that SSE is not one term to refer to both concepts at the same time but a combination. Social Economy doesn't claim to have a substitutive character, but SSE does, at least in its purpose. The understanding is that in RIPESS' (2015) SSE, the substitutive intent of the Solidarity Economy is kept, but the Social Economy's arguably more adaptable or realistic practices are combined. Another reason to adopt SSE as a concept, as Poirier (2014) explains, is that using a broader concept to represent different geographical, cultural, and temporal variations of SSE might contribute to the international

recognition of this comprehensive concept. Thus, helping build a worldwide alternative economy based on solidarity movements and social-based alternative economies. The first World Social Forum in 2001 marked the rise of the SSE as a study subject and as an emergent movement. Thus, the SSE terminology used here might refer to different variations of Social or Solidarity economy as researchers documented their expressions in different environments.

An institutional response to the movement can be observed in the conception of the Brazilian Secretariat of Solidarity Economy in 2003 within the Ministry of Labor. The first mandate of the secretariat was to map the SSE and its impact in Brazil (Lechat, 2009, p. 173), which served as an act of validation, quantifying its economic significance, which offered justification for increasing public investment in the sector. It also highlights the importance of validation and public recognition of concepts related to food systems.

The SSE can be understood as implementing “alternative economic strategies to reduce poverty and unemployment and to implement new civil-society-based economic revitalization strategies” (Mendell, 2009, p. 178). For Gaiger (2004), SSE has a more conclusive role in providing new practices in the workforce, breaking with the degrading working conditions and reconciling the worker with the process and fruits of their labour, ultimately overcoming and disposing of the alienating productive activity. However, SSE struggles to fulfill the substitute economic role proposed by Gaiger. SSE is unavoidably incorporated into a capital-based economy, consequently, the level at which the segment struggles are subjected to institutional and governmental directions. Mendell (2009) explains SSE enabling environment and defines its three supporting pillars: the social enterprises themselves, an enabling policy environment, and leadership, indicating that SSE cannot thrive without institutional and government support. The government's role is to create institutions to provide these enabling and thriving conditions for the SSE, such as capacity building, political spaces for discussion and representation, research, and networking. Mendell's assessment presents SSE as an economic strategy to reduce poverty and unemployment. This explains why participation in SSE organizations surges during or following the economic crisis when capital-based enterprises withdraw opportunities for traditional employment.

Developing the institutional pillar of support for family farming and SSE in Brazil has always been difficult. During the military regime, the country suffered from drastic state downsizing imposed by the International Monetary Fund. Moreover, around 1980, the existing public institutions that had focused on implementing the Green Revolution in previous decades continued to exclude much of the population as beneficiaries of its policies, especially family farmers. “As political parties and their domesticated organizations became increasingly irrelevant for rural peoples, a new generation of peasant organizations came to the fore” (Martinez-Torres & Rosset, 2010, p.152). The Brazilian social moments founded in this period would later participate in international organizations, such as *the Coordinadora Latinoamericana de Organizaciones del Campo (CLOC)*, and *La via Campesina*.

From 1985 to 2002, the Brazilian federal administration kept a neo-liberal focus, closely following international directions while battling a monetary crisis since the 1970s. In 1990, the first president elected by popular vote, Fernando Collor de Melo was impeached after not only, failing to stabilize the Brazilian economy but worsening the situation in two years of government. As a result, inflation rose again, reaching 1157% a year. Vice president Itamar Franco became the

next Brazilian president in 1992. In the global sphere, international banks and the United States (US) government had realized that Latin American nations would not be able to achieve the economic growth needed to actively participate in the global food trade implemented as the Green Revolution if they were to pay back their loans. “Between 1989 and 1994, private lenders forgave about one-third of the total outstanding debt” (Sims & Romero, 2014, para. 13) in exchange for the signing of the Brady Plan, which meant agreeing to adopt another economic reform aimed at making the Brazilian economy favourable to foreign investment. Fernando Henrique Cardoso (FHC), the appointed Minister of the Economy, oversaw negotiations and signed the Brady Plan. The execution of the plan in Brazil was called *Plano Real*, which seemed to have miraculously stabilized the Brazilian currency and renewed the country's credibility, attracting more foreign capital. The Minister FHC was not the architect of the Brady Plan. He was a signatory representative. In the next presidential campaign, Cardoso was regarded as the sole saviour of the economy and was subsequently elected president of Brazil, defeating Lula and the Worker's Party (PT) in 1995. The Brady Plan stopped the inflation crisis but had set the country in a continuous need to attract external capital, reducing national economic autonomy and causing economic stagnation, culminating in the 1999 crisis until the end of the FHC mandate.

The agrarian reforms were decreasing pace when on April 17, 1996, nineteen landless rural worker members of the *Movimento dos Trabalhadores Sem Terra* (MST) [Landless Worker's Movement] were killed by the military police while they were doing a blockade protest for the agrarian reform in the state of Para, North of Brazil. The event got worldwide attention, and the date later became the International Day of Peasants' Struggle (MST, n.d.). The repercussions of a violent military operation against peasants denounced the biases of the Federal efforts towards agriculture and the lack of institutional representation for family farmers. The national and international media pressured the FHC administration to create the MDA a space that would represent the family farming sector. The MDA was a significant achievement, an institution serving as an umbrella for agrarian reform, sustainable development, family farming, and SSE.

From 2003 to 2016, Brazil experimented with its first left-leaning federal administration with the PT, yet it was a coalition government with the liberal party. As a result, the agrarian reform that President Lula had presented, in his 1995 campaign, as the central instrument to dismantle capitalism and build a socialist economy was reframed to appeal to their liberal cohorts. Reframing the agrarian reform rhetoric and agenda to fit a more centric idea was a compromise to warranty governability, as his former radical-left base was not well regarded, the old communist comparison had to be avoided in the political scenario. Lula's policy benefited the bankers, the giant transnational corporate groups, and agribusiness. At the same time, Lula significantly enlarged the existing programs and institutional support to help small farmers. Balsa (2009) noted that the president new social assistance policies focused on improving access to public higher education, health, poverty, and hunger. His administration also significantly increased the MDA budget and created the Brazilian Secretariat of Solidarity Economy. The Secretariat of Solidarity Economy was a specialized umbrella to promote SSE development as a governmental institution. The SSE is the main direct commercialization channel for family farming production.

The first Census of Family Agriculture published in 2009 demonstrated the importance of family farming for national food security since it was responsible for producing about 70% of the food consumed in the country. The report was regarded as validation to increase the support for the family farming sector. However, the revitalized dualism between capitalism and socialism decreased the popularity of PT among both their liberal supporters and his leftist base, respectively, for investing too much and not enough in both. In the elections of 2014, the PT managed to re-elect Dilma but lost congress. A conservative majority coordinated the legislative and judiciary powers allied with the media to paralyze the country and overturn the election results. An intense economic crisis settled, culminating with President Dilma Rousseff's impeachment in May 2016.

When Michel Temer was sworn in as the president of Brazil, his first official act was to issue a presidential decree to eliminate the Ministry of Culture and the Ministry of Agrarian Development, the two most significant institutional structures and channels of federal support for the SSE and family farming, associating the sector with social assistance, deeming them an unnecessary cost when the state needed to downsize to counter the economic crises. Stating that the country already had an agricultural ministry and did not need two, thus making the MAPA again the central agricultural institution in Brazil. This action emphasizes again the importance of public support in the conceptualization of family farming and SSE as an economic sector.

The importance of institutional support spaces for the SSE in Brazil is high. As Mendell (2009) states, an enabling policy environment and leadership are paramount to SSE development. The Confederação Nacional dos Trabalhadores na Agricultura (CONTAG) (2017) described the drastic Federal budget cuts to the family farming budget and institutional support: The Food Acquisition Program (PAA) of the Ministry of Social and Agrarian Development (MDSA) had a budget of BRL 318 million in 2017, in 2018 was reduced to BRL 750 thousand, a cut of 99.8%. For the Food and Nutrition Security policy, whose main suppliers are family farmers, the cut reached 84.42%. The Special Secretariat for Family Agriculture and Agrarian Development will have its general budget reduced from R\$1.03 billion in 2017 to R\$790 million in 2018. Leaving aside the allegations of corruption in both left and right-leaning administrations, the difference between the two governments in terms of emphasis is significant. The PT administrations progressively created institutional spaces and gave identity and recognition to the SSE. Even the rural microregions which were historically excluded benefited from infrastructures implemented by the PT administration because this institutional support gave family farmers a formal status when they included family farmers in the Census as producers, as opposed to the rural population (Cencus, 2009). In other words, this gave family farmers economic inclusion in the agricultural sector's governmental budget. Lechat emphasizes that even large corporations considered successful relied heavily on public subsidies and policies to thrive. "The capitalist economy cannot survive without the subsidies, services and infrastructure offered by the state. The solidarity economy, too, needs the support . . ." (Lechat, 2009, p.174). Thus, the measure and formal recognition of family farming and SSE are fundamental.

The institutional apparatus that supports agribusiness is long-standing and colossal. The globalization of the food system did not happen overnight, and it is at the heart of the western world economy, so much so that McMichael (2013) claims the global food regime is capitalism. He referred to it as a regime because of its hegemonic power. McMichael divides its evolution into three phases: a colonial regime, whereby the British empire, in 1879, started dominating

international relations with the colonies' settlers, which provided them with a centralized international trading power until the 1930s. After a disruption in global trading during World War II, the industrial regime shifted the power centre from war-torn Europe to the United States, leading to industrial agriculture worldwide since the 1950s. By the 1970s, the industrial food regime gave place to the corporate food regime from the 1980s–2000s (McMichael, 2013). Today's global food system is based on dependency and materialized when the colonizing countries undermined the existing self-resilient food systems already present in the colonized countries and substituted them with the inter-dependent systems led by hegemonic power. The native local, more sustainable systems were violently dismantled to provide the large-scale export monoculture crops. In Roberto Guimaraes's book, *The Ecopolitics of Development in the Third World: Politics and Environment in Brazil*, he explained the development history since colonization in Brazil, from the 1500s when the Portuguese expeditions arrived on the Northeastern Brazilian coast to the 1990s. The Portuguese expedition did not immediately find any ready-to-extract goods, such as precious metals in other areas of America or ready spices as they had found in India. Thus, in his official report to the Portuguese court, Pero Vaz de Caminha suggested the land should be exploited, describing it as fertile and abundant in freshwater for what he defined as “plentiful infinite” (Guimarães, 1991, p. 86). This is a contrasting description of today's Brazilian Northeast region, which currently experiences long-lasting droughts. Thereafter, the Brazilian colonization was based on sequential extraction cycles.

Making a chronological connection with the evolution of the global food regimes described by McMichael (2013), it is possible to observe the historical correlation of supply and demands within the Brazilian colonization extraction cycles and Brazil's noteworthy economic crises. Demonstrating that Brazil was already an integrant nation in the centralized global food system. As a result, most political turmoil in Brazil followed power shifts or the implementation of new systems led by the Global North. Brazil's dependency on the global food market grew by the twentieth century. Each sizeable fluctuation in the international market triggered a national crisis. The 1929 crisis and WWII reduced Brazilian participation in international commercial trades. Guimarães (1991) claims this fact marked the downfall of export-oriented agro-commerce oligarchies and the period saw the rise of the industrial bourgeoisie that was domestic market-oriented. This interruption of international demand caused the Brazilian economic turmoil coincides with the power shifting period of the global food system pointed out by McMichael (2013), from the British-controlled international agriculture global trade to the U.S. industrialized agriculture domination called the Industrial food regime. The third food regime, which developed from the 1980s to the 2000s was called the Corporate Food Regime, saw supply chains' development into what this author called the “Supermarket's Revolution” (McMichael). This development fuelled international trade liberalization, which displaced farmers from their land and generated a population of displaced people, propelling the landless farmers' movements.

The construction of the governmental apparatus of agribusiness arguably started to protect farmers, at least the farmers producing international trade crops. Nicole Faires (2015) stated that President Hoover fixed the price of wheat and cotton. Thus, when the market price dropped, the government would buy them, protecting farmers and providing a stable market price. Unfortunately, the financial security of producing crops with a guaranteed sale at this minimum price caused overproduction. President Roosevelt subsequently created another regulation to control the excessive production of these crops. “Rather than paying farmers too much for a worthless crop the government now paid them not to produce wheat or cotton, by that logic any

business that got into trouble by poorly estimating the market should be bailed out and paid” (Faires, 2015, p. 2). These actions started to build a governmental structure that would later compose a set of measures to protect and fund agribusiness exponentially. Governments became the largest holder of private bank loans. Currently, these corporations are increasingly operating in the “direct creation, application, and enforcement of international law, through the representation of governments that support the expansion of corporate rights,” making corporations more sovereign than the state (Cerny, 1995, p. 618).

Today, the global food system is inserted in all society's spheres, dictating national and international public policies and social trends, and manipulating public opinion on health and nutrition. However, the food industry has neither competencies nor the drive for food provision to society and shows no commitment to public health or social responsibilities. This industry's goal is the continuous growth of its profit.

Methodology

The Participatory Action Research (PAR) methodology proceeds as follows. First, the conditions are **mapped**, and the issues and action plan to change the conditions are established. Mapping the issues includes diagnosing larger community conditions and origins of problems, analyzing how other people have solved these problems, identifying groups around the community that could contribute, discovering connections, planning actions, setting up working groups, and more. Secondly, the **actions** for change are organized and implemented. Action stands for intervention towards changing the condition. From this step on, the details are harder to predict as the participants' input will build the design of actions according to the group's needs and wants and depend on the participants' available resources and abilities. Third, the experience is documented and **analyzed**. Finally, the reflection step is where the whole approach is reviewed, and the results are evaluated to give a basis for a new cycle. The researcher can involve the participants in this step by asking about their feelings and ideas. The **reflection** is where the decision to adjust the approach to produce the expected results occurs or to set new goals to continue developing further.

Mapping

This paper will focus on conducting preliminary research, mapping the conditions and possibilities of family farming and SSE in the State of Rio Grande do Norte (RN) in the Northeast Region of Brazil. The *Associação de Apoio às Comunidades do Campo* (AACC) (translated to the Association of Support to Rural Communities) contributed to this investigation by helping establish communication and connections with the community developers and farmers.

We divided the stakeholders into three groups: (1) family farmers and people directly engaged with the solidarity economy, (2) community development agents, and (3) activists, economists, politicians, and academics. In this research, we conducted semi-structured interviews with the first group, the family farmers, and people directly engaged in a solidarity economy. We conducted interviews in periodic markets and social events, such as forums and meetings addressing SSE and family farming topics. For the analysis, the transcript of the interviews was

coded and analyzed with the assistance of NVivo. This software allows for better visualization of the connections within the data and supports the qualitative research organization of unstructured data.

Results and Discussion

The main research objective is to understand the conditions of family farming and possibilities for the SSE while bringing beneficial changes to the population involved. The interviews with the local population involved with the solidarity economy and family agriculture in the region of RN inquired about their own experiences, their standpoints on the role of scientific research on the subject, about the condition of SSE and family farming in that microregion, highlighting issues they face. It also inquired about the institutions of support. The results were amassed in three main categories: (1) conditions, (2) the role of research, and (3) the role of government. Given recent changes in Brazil's political direction since Michel Temer was sworn in May of 2016, the research also investigated the role of institutional spaces for the sector. As new administrative reforms caused significant cuts and extinguished programs and public policies. Figure 1 is a hierarchical tree map of the main findings, organized in themes that emerged from the coding process and forming a general overview of the results. The size of the boxes is proportional to their relevance within the data, and larger boxes represent a higher incidence of that theme concerning the others. Boxes located inside other boxes indicate a subtheme.

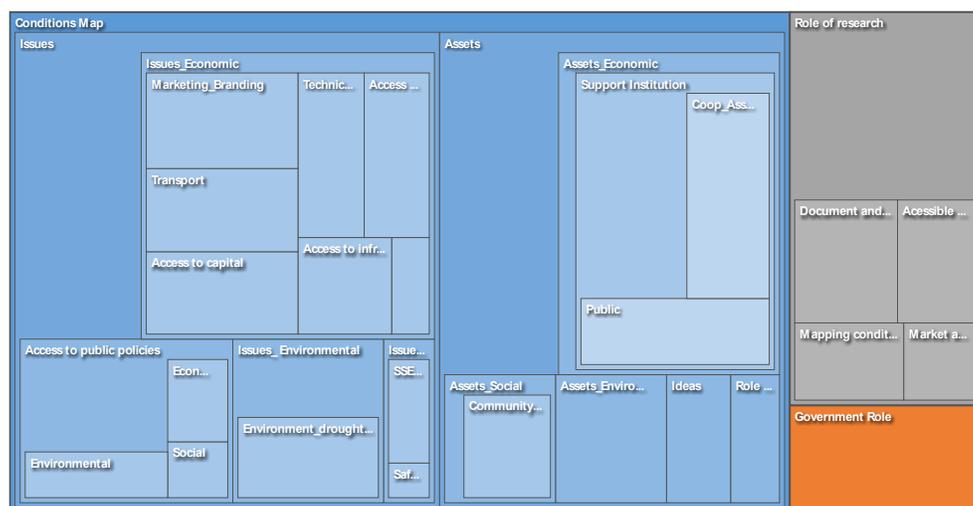


Figure 3. Compiled results overview made with NVivo.

Mapping Conditions

As shown in Figure 1, most of the data regarded conditions occupying the most sizable portion of the graphic. Thus, issues and asset themes emerged most frequently in the perception of the family farmers, craftspeople, and social entrepreneurs who participated in the investigation, especially about the participants' issues. The themes are clustered into economic, social, and environmental categories on sustainability.

Mapping the issues

We asked the participants to talk about the issues they faced in their experiences with family farming and SSE. Of the twenty participants, eighteen mentioned one or more issues. Most issues experienced by the participants were classified as **economic** issues, which are issues related to monetary scarcity, including the distribution of goods produced, especially in commercialization and marketing, access to transportation, infrastructure, and lack of physical space to sell products directly to the consumer, which, in turn, resulted in having to distribute a portion of the production to intermediaries reducing their revenue. Regarding access to capital in the form of programs for grants or facilitated credit, the respondents appointed the lack of opportunities for start-up initiatives in the sector. Another area where limited credit access was denounced was the access to capital for operating costs or to increase supply and production, which causes difficulty in maintaining cash flow, stalling their growth. Other issues were the lack of access to knowledge, especially on organic fertilizers; best practices to increase crop harvest; and technology for access and treatment of water. For instance, to help farmers build cisterns and wells, which allows them to maintain irrigation in drought periods.

The participants' main issues associated with environmental limitations were the recurring droughts that have increased in length in the past ten years. Another problem mentioned was their difficulties as non-certified organic producers since the certification was deemed economically unfeasible for most. Respondents also mentioned growing deforestation.

The interviews were analyzed individually. Thus, fewer responses were readily classified as social issues. However, three respondents stated that the stigmatized image associated with being a family farmer or a craftsperson is a significant issue. Interviewees also identified the safety problem for women working in specific public farmer's market spaces. Participants also identified the lack of specific public policies, the difficulty in accessing existing public policies, and the extinction of public policies understood as adequate by the recent reforms implemented by Temer's administration as significant problems.

The specific public policies mentioned were to build the capacitate of family farmers in various areas and support family farmers to attain organic certification. However, most participants criticized the reforms that extinguished the MDA and expressed concern for the future. Participants also critiqued existing policies, particularly those aimed at giving rural producers access to credit, described as inaccessible due to a lengthy, bureaucratic process and lack of digital literacy, particularly for older farmers, since some processes use digital tools.

Mapping the assets

The participants revealed that institutional support is essential for the economic sustainability of projects. Of the twenty participants, fourteen stated they have some partnership with an institution and credited their success to institutional support access. More than half of the participants said they are members of worker's cooperatives or associations. "The little ones need to come together to build something bigger, and then everyone will get stronger" (farmer) [own translation]. Some participants claimed the government had cut programs they used in the federal sphere. Nevertheless, eight participants declared they were receiving support from governmental institutions, highlighting the recent change where the municipalities and educational institutions

picked up a few development programs the federal sphere had eliminated. Participants mentioned that most municipalities organize periodic local markets weekly, giving family farmers and the SSE a public space to sell products.

As environmental assets, the analyses revealed that most participants use agroecology principles, multicultural systems, and organic production, even though most do not have certification. The participants also showed interest in developing more sustainable techniques to avoid chemical fertilizers and promote healthy eating of non-industrialized whole foods. A few participants mentioned the importance of strengthening local markets. The main social assets that emerged in the results were access to community support. However, some participants who stated they have community support revealed they do not have any other support and said that is a significant limitation.

We asked the participants to offer ideas to address the issues they raised. We classified these ideas as assets. Among the answers provided, many participants recommended the creation of a collective or cooperative organization. Participants also suggested offering a diversified product sales line through partnerships with other producers. One exciting answer is “regarding the issue of water access. We have to prepare ourselves, build cisterns, seek alternative technologies, use the muddy water, through the construction of biological desalination filters” (farmer) [own translation]. Another answer provided advice for policymakers to develop local public institutions’ opportunities to buy food products directly from small farmers. One participant suggested partnering with elderly homes, “they could buy directly from us and would have access to a healthier diet” (farmer) [own translation].

The Role of Research

Four themes emerged from questioning participants about how scientific research could help the sector develop. Two of the themes were more prominent among the answers. We classified the first theme as accessible technical research, and the second theme was named documentation and communication.

The participants stated they need access to knowledge and technology in many areas. They claim that the knowledge they seek is not readily available, inadequate to their production capabilities, is displayed in a complicated language, or needs adaptation to specific conditions. One response explained the lack of conversation between the studies and their practical application, stating, “. . . we hear about studies on bio-pesticide, bio-fertilizers, ways to use animals and insects to fight pests. Still, these researchers only contact us to find out what we need and never get back with solutions.” Another offered an idea, stating, “My suggestion to the university, to the university students, is that they really take the academic production to the field. What is the use of a study that does not get out of the lab?” [own translation].

The documentation and communication category refers to research on documenting processes and the sector's positive outcomes, mainly because most use agroecology principles but typically do not have the legitimacy of organic certification. One farmer said they must “first sell the story of how their product was produced than sell the product” [own translation]. They suggest research should contribute as a validating vessel to the sector's importance for the economy and the

environment. A participant questioned the scope of the outreach of scientific research “If scientific research could find a way to reach the environment outside the university, it could help open people's horizons. Because in the academic community, we already have support. Because in the university, the academia they know our ways, but the population at large, is still discovering” (farmer) [own translation].

In the other theme, mapping conditions, participants suggest more research should classify the issues to make them more well-defined. They also would like to see a mapping of the possibilities. One participant suggested that such research could help converse with the authorities. “I think if you have this written, formal, it is much easier for you to ask for support. We would be able to identify the points clearly and make it easier to demand from them” (government) [own translation].

The last theme raised the need for product market research and branding development. To offer directions on consumer demands, to find product trends and market niches in the area. They suggest research should also focus on expanding the sector market participation. The farmer's market regulation allows them to sell their produce and value-added products, but other markets do not always allow them. They need support in developing nutrition labels and other requirements to introduce their products to interstate or even international markets. Marketing funds and grants to promote the products and the image of farmers and SSE are also unavailable, making it hard to establish a product in the market when competing against industrial products, even if they offer better quality. The image of the family farmers sector was said to be devalued and associated with social assistance, where taxes payers fund subsistence rural living. Participants denounce more needs to be done to reinstate that family farming is a fundamental agricultural sector in the country.

The Role of Institutions

All participants mentioned the importance of institutional support for the sector's success. Start-up funds and cash flow are significant setbacks in the sector. The government is the only available guarantor, and without it, there is no access to credit. In one farmer's opinion, the government support was fundamental, with the farmer stating, “I think the SSE has to walk in partnership with the government. The government must help us because as individuals we are small, but together, we are huge” (farmer) [own translation].

They also explained that public policies must be created in conversation with the local actors. Communication between institutions and farmers should be easily accessible, constant, and prompt and should not depend on each government's party's ideologies. One participant said, “. . . Government support is a question of respect for the food producer” (farmer). Another respondent declared that promoting and protecting a better family farming image was the government's responsibility.

Another organization mentioned as crucial to the farmers was the municipal periodic public markets, usually arranged and funded by the local administration. In some cases, they represent the only direct market available to farmers. The Ministry of Social Development and Hunger Prevention has mapped food security in Brazil to collect public policy development

information. The mapping undertaken in 2014 highlighted the role of the periodic markets in the country's food security. It showed that periodic markets are present in all small and large cities, regardless of supermarket chains' strong presence. Unlike most modern food shops, periodic markets are still a market for selling fresh and naturally produced goods or preserved products processed by handmade methods without chemical additives. Another vital aspect of the report was that most producers sell their own products (Ministério do Desenvolvimento Social e Combate à Fome, 2014). Periodic markets represent a beacon of sustainable resistance and health promotion in Brazil.

Conclusions and Implications

The study brought to light conditions and possibilities in family farming and SSE, finding geo-specific challenges the participating organizations faced. It also highlighted the many systemic problems raised by the participants that are also encountered by family farmers worldwide. Despite the importance of family farming, it faces an unfavourable situation in the food market partially caused by a lack of support from public institutions and the conditions imposed by agribusiness's unfair influences. In addition, family farmers suffer from a lack of infrastructure, discouraging regulations, and difficulty accessing modern technologies. Issues concerning the distribution of farm produce are the main obstacles for family farming to succeed.

Institutional support spaces for the SSE are crucial in Brazil and the world. It is a wide-ranging economic condition. As Lechat (2009) emphasizes, even large corporations considered successful rely heavily on public subsidies and policies to thrive. However, the public subsidies for private agribusiness corporations are largely associated with sound economic investment. As opposed to the support for family farming and SSE sectors which are associated with social assistance.

The apparent negative connotation given to the agribusiness model in this review is not associated with high investment in technology, their focus on productivity, or the use of machinery that can make labour less intensive. On the contrary, it comes from the premise that achieving higher profit can justify practices that undermine countries' autonomy, peoples' sovereignty, social justice, and our planet's environmental health and limitations. Therefore, the fundamental problem with the agribusiness model is its purpose. Thus, as researchers, we must expand the alienated image of the food system's purpose beyond the disconnected idea that food systems are simply a means to produce food and intensify the acknowledgment of food systems' connections to place, people, and community.

Therefore, as Mendell states, whether the SSE is a remediating expression of capitalism or an ideologic way to reimagine the economy, as in Gaiger's view, a balance between capital and social interests must be maintained to construct democratic societies. Food is a fundamental right, and family farmers represent a central part of our food systems. Therefore, their institutional representation and enabling pillars must be re-established, protected, and kept out of reach of political-ideological battles regardless of who is in power.

The future implications and the continuation of this research include using the results as a contextual background. The results were offered and discussed with the remaining participants.

5. THE ROLE OF INSTITUTIONS IN PROMOTING RESILIENCE IN DEVELOPING SUSTAINABLE FOOD SYSTEMS: THE FARMER'S PERSPECTIVE IN THE NORTHEAST OF BRAZIL.

Published manuscript as book chapter: Dantas M. (2020) The Role of Institutions in Promoting Resilience in the Development of Sustainable Food Systems: The Farmer's Perspective in the Northeast of Brazil. In: Leal Filho W., Tortato U., Frankenberger F. (eds) Universities and Sustainable Communities: Meeting the Goals of the Agenda 2030. World Sustainability Series. Springer, Cham. https://doi.org/10.1007/978-3-030-30306-8_39

Introduction

In the last few decades, industrial agriculture and factory-based food manufacturing have transformed people's relationship with their food systems, replacing family farming, home food preparation, food waste, and eating habits from domestic and community-based heterogenic systems with a global commodities industry. Local farm produce is now part of an alternative niche. Cooking and sharing a meal with family and friends is reserved for holidays and special occasions. The food industry offers low-cost, standardized foodstuff, ready to eat in attractive plastic single packages, designed to be microwaved and quickly eaten on a desk for convenience. Adopting an industrial approach to the production and distribution of food is devastating. The actual socioecological and human health costs are mostly concealed from the public. If our government's understanding of agriculture is a business, its outcome is no longer food.

Food becomes a commodity; as such, the policies and laws governing it emphasize increasing profits primarily. Governmental and non-governmental institutions play essential roles in shaping food systems. However, institutions can erode or promote control of what and how we eat. Nestle (2013) suggests that the food industry invests enormous money in lobbying and publicizing research results favourable to the industry while undermining results criticizing their products. Corroborating Nestle's account, Joe Salatin (2011) criticizes how the government stages food regulation to ensure public health but regulates to prevent healthy eating while protecting corporations. Salatin states that many government regulations make it harder for small farmers to access local consumers directly. For instance, the regulations demanding a costly certification process of organic production are sometimes prohibitive to small farmers who already produce ecologic methods. On the other hand, harmful pesticides and Genetically Modified Organisms (GMOs) are undisclosed on food labels. This way, the produce from the so-called traditional agriculture method does not require expensive certification to use known pollutants and toxic substances in its production.

This paper takes a more in-depth look into the role of institutions in small-scale farming and the development of SSE as marketing and distribution systems in RN. It includes an interdisciplinary review of institutions' role and how they shape social interactions, introduces the industrial food system, and explores some of its adverse economic and environmental effects, highlighting their relevance to the United Nations (UN) SDGs. The literature reviewed peasants' social movements and briefly describes the institutional structure created in the Brazilian context to support family farming and SSE in the past decade.

For the methodological approach, the research is a case study that uses the PAR process, such as mapping and collective reflection. The data comes from participatory observation, social media, online news communication, and interviews with family farmers, SSE producers, and other stakeholders between July and September 2017 in the Brazilian Northeast state of Rio

Grande do Norte (RN). In a first contact to map general conditions, actors and contributors were approached at the CECAFES, the largest and only market focused on family farming and solidarity economy located in the capital of RN. After the mapping phase, the researcher visited working groups and local and periodic markets, conducting interviews with farmers and other stakeholders from the Rede Xique-xique and CECAFES, bank agents, community developers, and academics. We used a software called Max Weber Qualitative Data Analysis (MAXQDA) to process unstructured data to develop coding and analysis. The study investigated the perspective of small-scale farmers and artisans and the role of institutions involved. It also analyzed the vulnerability of family farming in the region due to the recent dismembering of institutional support structures in Brazil due to government direction change.

The results offer the unique perspective of the actors involved in family agriculture and solidarity economy in the State of RN concerning the effects of the late change in government within this research project's scope. The research showed that reducing the institutional support for family farmers can have devastating consequences for farmers' working and living conditions. However, it also exemplified the resilience within community organizations and networks.

Alternative food systems and Social Solidarity Economy

Family farming has had less political and economic support than agribusiness. However, in the last two decades, reports attesting to the importance of family farming, especially regarding food security and the promotion of sustainable agriculture, have put the sector in the spotlight. The Brazilian Special Secretariat of Family Agriculture (SEAF) states that the relevance of family farming goes beyond that of income generation. The relationship with the land is different from that of agribusiness landowners, who may not even be farmers. In contrast, family farmers' land means home, heritage, and culture in small rural municipalities. In Brazil's case, family farming has great socioeconomic importance, supplying the domestic market and controlling the inflation of staple foods consumed by Brazilians. Therefore, family farming is fundamental to food security. The 2006 Census of Agriculture (2009) found that most Brazilian farmers are family farmers. Of Brazil's agricultural establishments, 84.4% belong to small or medium family groups out of approximately 4.4 million establishments, half of which are in the Northeast Region (Census, 2009).

SSE is an excellent ally for family farmers. SSE helps farmers to sell their products. It is a fair-trade opportunity capable of transforming the quality of life of those involved. SSE is an international movement that respects social and environmental issues and encourages responsible production and ethical consumption. SSE has existed in the academic and political sphere for some time. In 2003, the Brazilian Secretariat of Solidarity Economy within the Ministry of Labor was created. Its first mandate, the Secretariat, was to map the SSE and its impact in Brazil (Lechat, 2009). By validating its importance, the administration could justify supporting institutions to provide SSE enabling conditions to thrive, such as capacity building, political spaces for discussion and representation, research, and networking.

The SSE is commonly found in the third sector's informal economy and cooperative models. The SSE is a natural manifestation of society or community organizations to collectively produce and distribute goods and services according to their needs and aspirations. In a case

presented in Mendell's work, the government's support promoted the development of an enabling environment in response to the SSE movement built by civil society. The SSE movement in Quebec grew out of the mobilization of groups on the ground, making it resilient and able to survive changes in government because it is rooted in the community. However, when the government withdrew support, the SSE experienced difficulties. This example demonstrates the vital importance of the relationship between the government and the SSE's participation in the economy. In addition to government support, the SSE benefits significantly from having spaces to express representation. When the government withdrew support in Quebec, the political negotiation spaces were already established and were not dependent on the government. Mendell and Neamtan state that the social economy assimilates individuals into the labour force when capital job markets are insufficient or private services are inaccessible, asserting that the SSE "plays an active role in ensuring that marginalized groups have access to jobs and certain services" (Mendell, 2009, p.15). In the same work, the authors suggest that the social economy takes on similar roles elsewhere. Mendell and Neamtan appointed various institutions as part of an extensive backing for SSE supported by Quebec, such as the Chantier de l'économie sociale.

The SSE has presented itself in various arrangements, including existing non-monetary exchange groups or in alternative local currencies. The SSE has long been deeply embedded in regions and microregions in Brazil. In an interview, a community development agent stated that in and around the capital city of Natal, RN, the SSE participation oscillates following unemployment rates. Much like the examples from Quebec, when unemployment rises, the SSE absorbs some of the labour force. However, when the job pool increases, people leave SSE to return to traditional employment. As stated by a community development agent, "outside the capital cities, in the interior rural communities of Brazil, communities are naturally organized in solidarity" (Dantas & Silva, 2018, p.5). This is due to the historical situation of the exclusion of small farmers, making solidarity essential. In the poor rural areas of Brazil's Northeast Region, the SSE seems more than an alternative parallel economy expression of capitalism. In these microregions, SSE might offer the only channel of economic participation for a portion of the population. The SSE is particularly present in local food systems since street farmers' markets still offer food staples outside of cities in Brazil. Thus, the SSE movement in Brazil is resilient, community-rooted, and has endured historical hardship. However, to a funding agent interviewed for this research, when the governmental directions and support retract, the livelihood of this population, where SSE is the only economy, is significantly affected.

There are two frequently opposing directions to approach food systems in the Brazilian context: agribusiness and family farming. Although agriculture has been at the heart of the socio-economic fabric, institutions' role in developing the food systems was neglected by economists and academics until recently, especially the portion comprising institutions representing small-scale agriculture. The rise in economic growth, powered by the shift in consumption that started in the 1960s, marked the beginning of a continuous race to produce and consume more while disregarding nutritional needs and environmental limits.

To adjust to this systemic design, institutions were restructured to support the development of strategies that shapes decisions to trigger economic growth. The various institutions undertake significant roles in our societies, representing "the humanly devised constraints that structure political, economic and social interaction" (North, 1991, p. 97). They are the formalized measuring organism of society that promotes partial standardization of groups

of people too large to know each other. Institutions may be governmental, private, religious, or otherwise, and “with the standard constraints of economics, they define the choice set and therefore determine transaction and production costs of economic activity” (North, 1991, p. 97).

Among the leading institutions involved in agriculture are banks, as credit can expand production, influence, and institutionalize economic directions. Banks commonly act in the international sphere's political and economic fields in the creditor's position, conveying development models followed by regions or entire countries. Governmental institutions also play a significant role in agriculture. For instance, the Brazilian Ministry of Agriculture, Fishery, and Supply (MAPA) formulates and implements policies for agribusiness development in Brazil and is one of the country's oldest and most powerful institutions. Institutions geared towards promoting knowledge play a similarly vital role in the sector. The Brazilian Agricultural Research Corporation (Embrapa) provides technological support nationally, and the National Supply Company (Conab) focuses on distribution and food security. Both Embrapa and Conab are public companies that operate under the MAPA coordination (MAPA: Institutional, n.d). The agribusiness sector interests coincide with international trade interests. Therefore, it is easy to deduce why agribusinesses have been provided plenty of institutional representation and support.

Large institutions' trends are dominant but can change, especially when challenged by other institutions or community mobilization. In the 1980s, under the military regime, Brazil suffered state downsizing imposed by the International Monetary Fund. Thus, “as political parties and their domesticated organizations became increasingly irrelevant for rural peoples, a new generation of peasant organizations came to the fore” (Martinez-Torres & Rosset, 2010, p.152), referring to *La Via Campesina*. Brazilian social movements actively participated in the forging of international institutions such as the *Coordinadora Latinoamericana de Organizaciones del Campo CLOC and La Via Campesina*, a broad coalition of farmer's organizations from Europe, Latin America, Asia, North America, and Africa.

Another vital institution in the Brazilian agricultural scenario is the Landless Worker's Movement (MST), one of the most significant movements in the world and organized in 24 states in the five regions of Brazil. In all, about 350,000 families' members of MST have acquired land through the organization's demonstrations and struggles toward agrarian reform. After settling, most families usually remain members of the MST since the conquest of the land is only the first step towards realizing agricultural reform. The MST played a vital role in creating the Ministry of Agricultural Development (MDA) (MST: History journal, n.d). Following April 17, 1996, when the military police killed nineteen MST members while the farmers were doing a blockade protest for agrarian reform in Para, North of Brazil, the MST increased pressure for better representation within government institutions.

According to the MST history archives, this event's mobilizations and worldwide repercussions pressured the Federal administration to create the MDA (MST: History journal, n.d). The MDA was an essential and long-anticipated achievement to represent Brazil's other spectrum of agriculture. The MAPA has clear objectives for industrial and large-scale agriculture. The MDA served as an umbrella for agrarian reform, sustainable development, family farming, and the SSE interests. With a separate budget independently administrated by the MAPA, Brazil saw significant expansion of the family farm and solidarity economy institutional support from 2003 to 2015. However, Brazil experienced a significant political and economic crisis following

President Dilma Rousseff's impeachment. Under pressure to stop the financial problems, the MDA was extinguished at the beginning of President Michel Temer's term as an administrative reform to cut public spending. It seemed acceptable for much of the population to cut funds supporting family farmers. Public spending in this sector has long been associated with social assistance instead of economic investment. However, some MST members accused the administration's decision of political persecution, corruption, and gerrymandering led by agribusiness lobbyists. Without the MDA, family farmers lost their central government representation arrangement.

Communication and education also play an essential role in shaping widespread belief systems, translating into popular support or demand. For instance, Brazil has a widely accepted belief that government support for family farming is social assistance. At the same time, public funds given to agribusiness is an economic investment, disregarding that family farming produces a substantial portion of the food people consume. Understanding the significant role of the systemic design behind our global food system and how these institutions have shaped food choices and idealized agribusiness as a thriving food system is paramount. A significant institutional change is needed to bring a more balanced representation of Brazil's agriculture scenario. This is true, especially regarding how corporations control the public image of institutions to reflect private interest.

The election of Jair Bolsonaro for the Brazilian presidency in October 2018 meant additional support for agribusiness and more disregard for environmental issues. In an interview for the Agência Brasil in November 2018, Bolsonaro demonstrated his support for agribusiness following the French president's G20 declaration of concern regarding an ecological transition at home only to sign trade agreements with countries that do not commit to ecological transitions. Subsequently, trade between Mercosur and the European Union was suspended. In response, President Bolsonaro stated, "His administration does not intend to take on any environmental commitments that impact the Brazilian agribusiness profits", citing protection of national interests as his reasoning [own translation] (Agência Brasil, 2018).

The United Nations (UN) Food and Agriculture Organization (FAO) is the largest global institution promoting food access. They aim "to achieve food security for all and ensure that people have regular access to enough high-quality food to lead active, healthy lives" (FAO, About Us). The FAO framework, research, and reports helped identify issues and possibilities worldwide, stressing the enormous potential of family farmers in preserving natural resources and eradicating hunger. "They not only produce about 80% of the world's food but also serve as custodians of about 70 – 80% of farmland" (FAO, 2014). In 2015, the UN announced the SDGs, which resulted from a global partnership for world transformation towards peace and prosperity (UN, General Assembly, 2015). The global food system is a massive challenge if we are to achieve the SDGs. About 75% "of the extremely poor lives in rural areas, with most dependent on agriculture for their livelihoods and food security" (FAO, 2015). Within the industrial food system lies the biggest culprits against sustainable development.

Case Study

As previously discussed, institutions are socioeconomic constraints that determine how exchanges, transactions, and production of economic activities function. Consequently, they have a fundamental role in enabling systemic changes. This case study examines the institution's role from the perspective of family farmers in the RN state in Northeast Brazil, demonstrating their needs, expectations, experiences, and exchanges with institutions at play. Most study participants are family farmers. In addition, a few interviews were conducted with bank representatives, community development agents, and academics. The institutions represented participated in CECAFES and Rede Xique-Xique, which focus on this case study.

The concept of a network is like that of the institution, as it also embodies a set of rules for political, economic, and social interactions. However, networks involve more personal exchanges and trust as links between the interactions and are conducted by a thinner, non-institutionalized balance of power. North (1991) describes it as organizations where the positions are constantly vulnerable and are usually not taken for granted, and everyone needs to be continuously involved in securing their place. A network type of organization is shared in community development projects and SSE. This study also considers cooperatives, associations, and informal collective organization networks.

The Xique-Xique Network is a solidarity economy cooperative from the semi-arid region of Northeast Brazil in the State of RN. The Xique-Xique Network started as a network in 1999 with women from the MST settlement called Mulungunzinho in Mossoro, RN. Once they acquired land through the MST mobilization and federal government agrarian reform program, they realized their struggles did not end there, and their chances of flourishing individually were slim. The assigned lots were in an isolated area, far from urban centers and without access to infrastructure. So, they began as solidarity initiatives do, brainstorming ideas on generating income through collective production to overcome hardship. Agriculture was already part of their daily lives and traditions. Thus, they decided to form a network to market their organic produce surplus. According to the association's online portal, today's network has urban and rural workers from settlements across the RN state, organized in more than 50 production groups and articulated in 19 municipals periodic markets and one permanent market location (Rede Xiquexique, n.d.).

The CECAFES, located in the state capital, is a space for the direct marketing of farmers' produce, and it is the result of ten years of social demands and mobilization (cooperative member). The CECAFES structure was built in 2007 but only came into operation in March 2017. Currently, it offers a modern commercial space with 40 small booths for family farming units and 27 store booths for legal organizations, that is, cooperatives and associations of local farmers and artisans. The participants for this case study were 19 individual farmers and artisans' members of the CECAFES market and six farmers members of the Xique-Xique Network. The other participating actors are three community development agents, two academics, and two economist bank representatives.

We asked farmers to share their experiences about their support from any institution regarding their projects or farming activities. Also, they were asked about their involvement with the institutions. The non-farmer group representing the institutions was asked to share their experience with farmers and cooperatives and their involvement with the Xique-Xique Network and CECAFES market. The second question concerned the identification of expectations for and

from institutions. That is, what is expected and from whom? Finally, we asked participants if the recent government change had affected their projects and, if yes, how?

Results

The roles of institutions in actively supporting farmers and artisans are divided by type into three categories. Larger icons symbolize the most relevant institutional roles. Governmental institutions, local networks, banks and funding agencies, and NGOs are also mentioned.

Institutions and Networks Actively Supporting Farmers and Artisans

Participating in network organizations, such as formal and informal cooperative groups, was a fundamental requirement, especially in difficult times. The farmers' main difficulties in an individual family unit booth at the CECAFES market involve transportation and coordination, especially in off-season periods when the surplus is too small to arrange transport. The CECAFES market is the only place to sell their produce for many. Others reported logistic and infrastructure problems at the peak of fruit harvest.

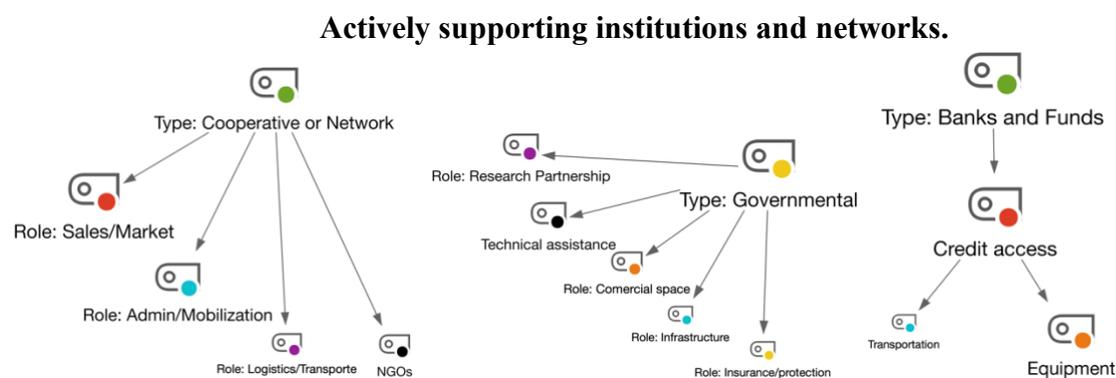


Figure 4. Hierarchical code models created with the use of software MAXQDA.

The account of a cashew tree plantation farmer about her limitations exemplifies the issues. In Brazil, the cashew fruit's flesh is also consumed. The cashew fruit can be eaten raw, as juice, jam, or alcohol, while the cashew nut can be roasted, salt, or sweetened. However, since the farmer does not have the means or access to processing facilities, she harvests only the amount of fruit she can sell as fresh produce at the market and let most of her crop fall and rot on the field. All farmers interviewed from the Xique-Xique Network are from the RN State's semi-arid area and stated that being part of the Network kept them in the farming industry instead of getting a side job or abandoning farming altogether. It would be impossible for most of them to sell their surplus directly to the consumer without collective efforts because of transportation costs. Also, off-season amounts of surplus are not viable to sell individually. Participation in the Xique-Xique Network cooperative gave them access to micro industrialization, as some use added value to produce frozen fruit pulp. The Xique-Xique Network management participates in public biddings to provide products to public bodies and expand sales.

Governmental institutions' involvement varies significantly. For example, some farmers participate in the public-school lunches provision program, which gives farmers direct market access by catering to public schools. While much of the program assessments were positive, this institutional support's continuity is uncertain because of the program's recent federal budget cuts.

Farmers' participation in the public contract biddings was insignificant but observed only among the collectively organized farmers. This is because individual family units usually do not qualify to participate in public bids. However, the collective of organized farmers demonstrates an interest in increasing participation in public bids. They also cited lobbying and lack of cash flow as impediments enabling them to function while waiting for commonly delayed government payments.

The most significant support received from institutions is technical assistance. The central institution currently offering courses and assistance to promote development is the SEBRAE, an institution credited for implementing water treatment workshops at the farms. Municipalities' periodic markets were also an essential local opportunity for commercialization. A few farmers positively reviewed a program to facilitate credit to buy small trucks to transport their produce. However, most participant farmers declared they have unsuccessfully sought institutional support, especially for credit access and other government program participation. This is especially true for the respondents that are not organized collectively. After the loss of federal institutional support that followed the presidential elections, farmers are struggling to find other support institutions. Farmers also reported that it is harder to access even the programs that are still in existence because when they extinguished the MDA, they cut the connections with local channels. Now, the *Territórios da Cidadania* (Territories for Citizenship) had offered a meeting place for direct relationships between farmers and the federal sphere. One partnership that flourished in the past year with public universities and colleges. Farmers perceived this partnership as extremely important for these uncertain times.

From the perspective of funding agents and community developers on project experience and involvement with the projects, it is apparent that governmental involvement leaves much to be desired. One funding agent interviewed oversees project implementations in the region. He was involved with the CECAFES cooperative since the structure was built in 2007 and inaugurated in March 2017. He explained that in the initial draft for the project, the proposal was for the bulk investment in equipment and building to come from the MDA. The state government directly funded water, electricity, telephone, and security expenses. Starting with 100% of these expenses, it would transfer 20% of the costs back to the coop each year. That is, in five years, the government would be completely absent. However, in the ten years, a concretization of these terms did not occur. The bank representative recently declared a renegotiation between the state government and the cooperative. "Now, the government was to finance only those operational costs for one year, which after one year of operation still has not yet happened. With all the political, debt and legal issues they face, the government could not have transferred the resource..." (Bank representative) [my translation]. Therefore, CECAFES was funded by the now extinct MDA. They covered the building costs and coop members' initial subsidy. After ten years of waiting for the RN State to supply the operational equipment and cost or hiring the essential personnel that was previously promised, the cooperative management decided the farm members would absorb the final costs and get the fire department's approval to open for business. "Then,

they came for a photo op at the opening to take credit for what we did. But so far, the [RN state] Government has not paid a dime” of the promised investment. (Coop member) [my translation].

The Expected Role of Institutions and Networks

The question inquired about the identification of expectations from institutions. For the networks, the farmers expect further development in the logistic capabilities of their networks. Also, expect better access to 'sharing' [workshops and other collective learning] opportunities, to social knowledge, especially in developing micro-industrialization and food processing.

The support to increase transportation capabilities to expand the reach to surrounding regional markets provided by Xique-Xique Network is necessary but found to be insufficient. The farmers acknowledged the importance of the network organizations but also recognized their limitations and challenges. Many individual family farming units would like to change the bureaucracy and difficulties organizing and legally starting a cooperative.

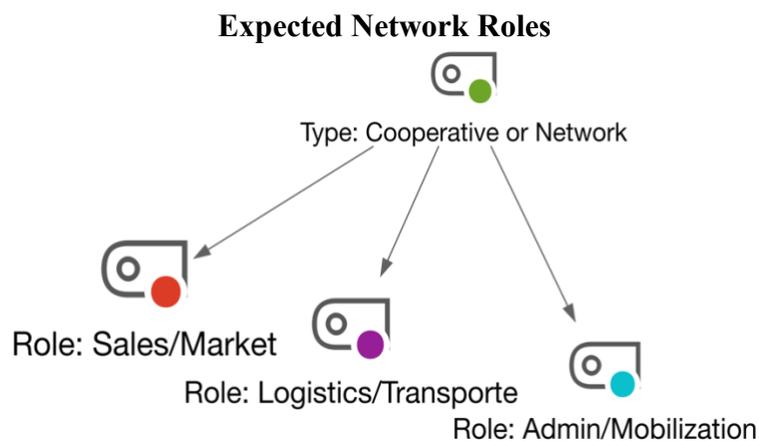


Figure 5. Hierarchical code model created with the use of software MAXQDA

For community development agents, the institutions' role is to create spaces for representation and implementation for continuous development. “We had the MDA that was a space, a type of guarantee in terms of resources, channels of dialogue with the government and through it achieve effective public policies . . . it was limited, but we were there building it up” (community development agent) [my translation]. Farmers corroborated the concern about the lost connection with an institutional representation.

Public universities and college participants have high expectations for their partnership roles. For example, family farmers are also direct food suppliers for internships and research. In the Xique-Xique Network case, the university provides an IT intern position filled by the local federal college students. The farmers reported that having tech-savvy young people around helped them implement coordination management software and better their accounting registers. That meant having their production, sales and finances better documented, affording them better odds while competing for markets and credit. However, they also criticized how knowledge is

produced *with* the farmers, but not necessarily *for* them. Their research, methodologies, and knowledge dissemination in academia are frequently inaccessible or have difficult applicability.

Some not-for-profit organizations NGOs, such as the AACC, were said to have significantly contributed to the development of the Xique-Xique Network in past years with technical and mobilization support. However, these NGOs mainly were funded by federal programs linked to the MDA and had now been defunded and can no longer continue supporting the project.

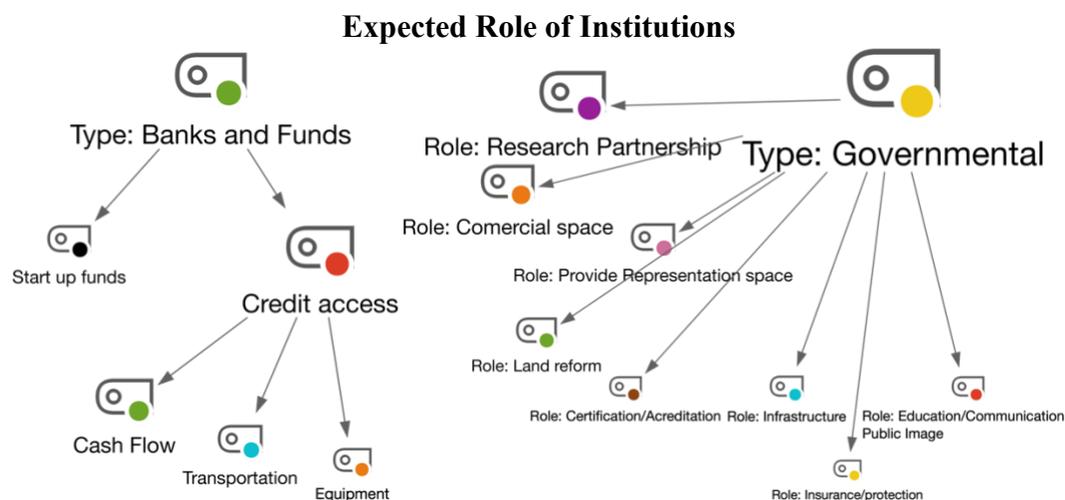


Figure 6. Hierarchical code models created with the use of software MAXQDA.

Government Ideology and Vulnerability

The National Confederation of Agricultural Workers (CONTAG), the largest federation of agricultural workers' labour unions in Brazil, issued an open letter of dissatisfaction with the government's cutbacks toward the SSE and family farming after the announcement of the 2018 national budget. Below is a translation of a portion of the letter highlighting the administration's budget cuts, published in September 2017.

. . . The Food Acquisition Program (PAA) of the Ministry of Social and Agrarian Development (MDSA) will be virtually extinct. In 2017 it had a budget of R\$318 million, and for 2018 R\$750 thousand, that is, a cut of 99.8%. The PAA at Sead will suffer a reduction of approximately 70% compared to 2017. . . . For the Food and Nutrition Security policy, whose main suppliers are family farmers, the cut reaches 84.42%. The Special Secretariat for Family Agriculture and Agrarian Development (Sead) will have its overall budget reduced from R\$1.03 billion this year to R\$790 million in 2018. . . . The agrarian policy will be abandoned. The resources for obtaining land for agrarian reform will be reduced dramatically from R\$257 million to R\$34.2 million. The organization of the land structure from R\$108 million in 2017 to R\$8.1 million in 2018. In this sense, the Expanded Deliberative Council of CONTAG reinforced the need to carry out an agenda of efforts and decided to hold the National Mobilization Week from

October 16 to 20, 2017, with the Unified Day Of Fight being held on October 18, 2017, all over the country (CONTAG, 2017).

When asked about the recent government change, the participants had distinct narratives. Referring to the extinction of the MDA and the changes to the Solidarity Economy Secretariat, one of the funding agents stated that: “. . . the question of extinction of acronyms does not always determine the extinction of functions”. The bank representative seemed defensive when answering the question and emphatically concluded his response as follows: “In fact, that was not it at all! What happened was just cleaning the public machine that had been swollen. But their functions and assignments remained intact” [pause]. Explaining that the MAPA would offer the same representation to family farmers as the MDA did but would cost the federal government less, which was a positive change in his opinion. “. . . The MAPA kept the National Institute of Colonization and Agrarian Reform (INCRA), CONAB and PAA programs. Only instead of running in three buildings, it is now running on one, but public policies continue even with the unified budget. At least this is my perception” [my translation].

When reminded that the programs mentioned had suffered severe cutbacks of 70% to 80%, the funding agent changed the focus and stated that even with federal cuts, funding was still available for the family farmers through other channels outside governmental programs. For instance, he asserted the recent agreements between the RN State government and the World Bank, and other funding institutions. He cited that the RN state government had recently accorded with the World Bank and heavily invested in family agriculture. He presented a pilot project of approximately R\$3 million for the recovery of fruit pulp and cashew processing and another R\$12 million for the development of dairy micro-industries, focusing on the purchase of equipment, infrastructure, and infrastructure assembly. (Bank representative). He also shared that, “in all the projects I have been overseeing in the last ten years, gender diversity is a requirement. There are projects aimed at young audiences. Others make demands on the percentage of women”. After sharing a concern appointed by the farmers about the same programs' parameters not been suitable to attend the farmers' requests, he answered: “As for the question of need and size, also, all our investment is only completed after a thorough diagnosis in the community itself.” He further explained: “There will be a team of technicians, agronomists, economists to talk to them to identify the area of need, how much of production is in the community to determine the size and type of the industry they need” (bank representative) [my translation].

Concerning the role of banks and funding agencies, farmers offered a different account to that of the bank representative agents. The farmers described a disguised top-bottom approach that does not entirely meet their needs. The quotes below are a collection of statements from farmers in focus groups and interviews who offered explanations on how the thorough diagnosis in the community itself occurs. “They usually want us to buy things we do not need or want, then some people buy into the idea, and all they acquire is debt” (Farmer). It is difficult for the needs to coincide in a top-down approach, but there were cases where it did. For example, one of the family units used the facilitated line of credit to buy three vehicles. “They do not have credit for all our deficiencies, ...but you can buy a car to distribute products, and you have three years of grace, which was very relevant. It changes life a little.” On the other hand, the most commonly observed opinion was better described by the following:

First, they come here and spend way too long, months at a time, and too much money running diagnostics workshops. I must have participated in at least ten of them, but every time we tell them what we need. They say, oh no, this is outside the World Bank scope. ...To the point that we just asked, what is in the scope? Then they say it is participative! We already had a facility and equipment. We need money to buy supplies and inventory. We need cash flow to improve operations. Oh, that the World Bank cannot finance. Then do not tell me it's participative! ...to say that the needs were determined by the community . . . Please, these projects, especially those from Sudene and the World Bank come in a ready package. Either you are in or out.

The Superintendence for the Development of the Northeast (Sudene) acts under the Ministry of Regional Development and aims to promote development in the area (Sudene, n.d.). It was created to address the uneven development between regions in the country.

The farmers and bank representatives both acknowledged that the withdrawal of institutional support in the current government is substantial. One economist was emphatic, stating that when institutional policies of acquisition of production of family agriculture by the State, municipal, and federal administrations are present, “we observe an improvement of life there in the base, in the field, where the farmer is living with his family. When the machine cuts that down, we notice a significant drop in the quality of life of the countryman” (bank representative) [my translation].

Conclusion

This study demonstrates that institutions are fundamentally important in developing family farming, SSE, and promoting sustainable agriculture, which are paramount to peasants' wellbeing and health. It also shows that participating in Network organizations promoted resilience, as observed when comparing individual family farming units' experiences and the Xique-Xique Network coop members. This is especially true in times of crisis. Intensified pressure and time constraints diminish the family farmers' ability to participate in much-needed administrative, financial, logistical, and political roles.

The study also highlighted the incredible institutional power the industrial food producers seem to hold over federal governments and institutions that shape public opinion and industrial food and health trends, in addition to shaping the idealized economic importance of agribusiness.

The SDGs goals of ending poverty and hunger, promoting health and wellbeing, providing decent work for all, sustainable use of oceans, sustainable management of water, reducing inequality, and protecting, restoring, and promoting sustainable use of terrestrial ecosystems that are heavily dependent on our ability to change our food systems. The sixteenth and seventeenth goals discuss the enabling framework to implement the changes. Goal 16 asserts the need for “effective, accountable and inclusive institutions at all levels to promote just, peaceful and inclusive societies,” highlighting the importance of a healthy agricultural system. Goal 17 focuses on partnerships urging all development actors to engage and share knowledge and resources to implement SDGs (FAO, 2015).

Even though the need to change the industrial approach of the global food system is widely acknowledged, the recent political events have shown that the institutional structure shaping and protecting this model continues to grow, pushing the rhetoric of its acceptance in favour of economic growth even over peoples' and the planet's wellbeing. There was a brief development of a national institutional structure in Brazil toward supporting family agriculture and SSE in the last decade. It was an incomplete construction, slow and truncated, but it seemed for a moment to be stable. However, after the change in government in 2015, much of this structure was dismantled in a little over a year. North (1995) talks about how a change in institutional structure is implemented by incorporating challenging institutions until their substitution offers enough support to sustain the change. However, while the alternative structure was slowly being established, there was no dismantling of support institutions for agribusiness. On the contrary, they have strengthened, and agribusiness has experienced tremendous growth in the same period.

Determining the importance of institutional spaces for the SSE and family farmers is complex and multifaceted. Many features emerged in this case study's scope, and a few roles stood out.

First are the role networks, usually in the form of cooperatives. The continuous pressure to increase production when consumers demand cheaper food has alienated many farmers from essential functions, such as administrative tasks and political participation, which, in turn, grew the sector's vulnerability. There was a visible difference in working and living conditions between farmers and artisans organized in cooperatives, associations, or even informal networks than those working in individual family units. The main benefits of being part of a network were sharing administrative and logistic costs, principally with transportation, political participation, establishing institutional partnerships, and having a community as backup support. Thus, farming network organizations promote resilience. Partnerships between farmers and education institutions showed a promising role in helping the local development of sustainable food systems. Education institutions of different levels are present in surrounding municipalities. They could mutually benefit from internships, research partnerships to develop small-scale farming technologies and direct transactions of an agroecological food supply. The government's role, in offering technical assistance and the acquisition of products from family agriculture by the State were deemed the most critical roles.

Mendell (2009) described the pillars of enabling structures for developing SSE. The social enterprises themselves, in this case, continue to adapt but are struggling; The enabling policy environment has suffered major losses; The spaces for leadership and political representation were dismantled, making it especially difficult for family farmers in isolated regions to reach any representational channels.

The future of family farming in Brazil is being threatened, and with the election of Bolsonaro for the presidency of Brazil, it might take some time before it recovers. However, SSE and family farming are older than agribusiness and the mainstream economy. It has changed with it, in moments advancing, in others declining as it responds to socioeconomic and political stimulus. The sector's vulnerability to the recent dismembering of its institutional structures seems strong, but so is the resilience of organized people.

6. 'GOOGLE IT': A SEMIOTIC UNDERSTANDING OF FOOD CONCEPTUALIZATION AND ITS POSSIBLE EFFECTS.

Manuscript submitted for journal publication at: Food Studies: An Interdisciplinary Journal.

Introduction

Historically, the relationship between rural development and commodity agriculture has been complex. Rural sociology is the study of local communities. It is delimited by demography or place and has been a significant factor in making food-related policies. Sociology has opened debate opportunities on different orientation paths. Agricultural conceptualization has changed dramatically mainly because larger industrial farms hastily replaced the small and medium-sized properties described in the last 50 years (Alkon & Agyeman, 2011). Thus, revisiting food conceptualization and its corresponding perceived image is necessary. The industrialization of agriculture worldwide and the consequent change to the study of rural societies affected the conceptualization and reputation of farmers and agricultural systems.

The use of technology to create readily digital idealization might exacerbate these impacts. The importance of overcoming blind spots that obstructs the visibility of food systems' impacts is emphasized in an International Panel of Experts on Sustainable Food Systems (IPES) publication as a key challenge to be addressed in order to build healthier food systems. Our mainly urban population is increasingly disconnected from agriculture, which may undermine awareness of its impacts, and in turn, play a role in food choices, causing individual and public consequences. "These blind spots and hidden impacts make it less likely for problems to be prioritized politically" (IPES-Food, 2017, p.47). There are different challenges affecting the public view and contributing to the alienation between food and agriculture. One challenge to be addressed is related to the cognitive knowledge of how food is produced and processed, as well as how it relates to its socio-economic and environmental costs.

This study explores the contemporary conceptualization and the perceived image of food systems. It questions the role of modern communication channels in the conceptualization and visualization of food systems and in upholding the blind spots that hide its impacts. This enquire uses mixed methods and tools to observe the connections between different aspects of how food systems are conceptualized and identify their impact. Grounded in a multidisciplinary literature review, this study draws a correlation between the politics of development and food sociology. This sustainability framework focuses on the conceptual differences between agribusiness and family farming and how the general conceptual understanding can influence food choices. The study notes that the ramifications of food choices reach beyond individual decisions about what or where to buy food. People also make choices about food policies when they vote or make demands on their constituents. Based on people's perception of food systems, these choices can trigger community, institutional, or government support for different agricultural models. Besides, how people attribute value to different agricultural approaches or convey meaning related to the various perceived images of food system concepts may offer broader insight into how food choices are shaped and by whom.

The paper uses semiotics aspects to understand food conceptualization and its effects. It also addresses the perceived image of the food system's concepts, how it affects farmers in

Northeast Brazil, and the mechanisms being utilized to improve the situation. Theoretically, the paper addresses how semiotics as a conceptual framework may be used to analyze the food systems' perception.

The issue addressed here is that food conceptualization refers to how different people perceive food. While food conceptualization differs from one person to another, specific ideas about food or diet trends are common. Generally, diets in the exact cultural or social delimitation can be similar. For instance, what is perceived as Italian or Chinese food, are recognized concepts with related recognizable images. Do these images portray these concepts accurately? Do these images oversimplify or misrepresent their corresponding concepts? Probably. Knowing how food systems are portrayed can help us understand how they were constructed and connected to the elements that have contributed to and shaped them. Looking at images of what is recognized as food systems by our modern databases is a way to understand what people already know concerning that subject. A better understanding of how food systems perceived image is shaped is essential for crafting effective new ways to communicate about nutrition to improve food choices. People are more likely to integrate and act on information related to their existing knowledge structures. This paper was guided by the realization that identifying shared ways of thinking about food within a culture may improve the perceived image of food systems.

The denunciation and concerns of family farmers interviewed in preliminary research offered the guiding question for this research. Farmers stated that the image associated with being a family farmer or a craftsman is marginalized. The economic importance of their production is undermined. The farmers questioned the scope of the scientific research and whether it could reach environments outside the university, shape peoples' opinions, or could be disseminated by informal mainstream media because “. . . it could help open people's horizons. Because in the academic community, we already have support . . . but the population at large is still discovering us” (farmer) [translation]. The farmers also suggested problems with the public image of family farming and the romanticized or idealized notion associated with public image towards agribusiness.

This study explores the conceptualization of contemporary food systems, using a multidisciplinary approach to observe the connections between different aspects from different points of view on how food systems are conceptualized and their impact. Grounded in an interdisciplinary literature review, it draws a correlation between the politics of development and the sociology of food. The sustainability framework focuses on the conceptual differences between agribusiness and family farming and how the general conceptual understanding can influence food choices. Food choices go beyond individual decisions about what or where to buy food. How people demand food policies can translate into institutional or government support for different agricultural models. We attribute value to different agricultural approaches or convey meaning related to our food systems that may offer broader insight into food choices.

This study takes the interpreted view of food systems from a group of farmers from Northeast Brazil to explore the semiotic sign systems that readily represent the food systems. It also takes other actors' points of view to offer a more integrated snapshot of the conceptualization of the food systems.

Research design

Food illiteracy is an overlapping challenge to the realization of the UN's SDGs. Food literacy skills and education is the strategy appointed in the Curriculum Framework for Enabling the SDGs. Although most people have immediate access to an immense knowledge platform, food illiteracy persists, where people usually have access to food products but have no direct connection with food systems.

An expression made up by verbalizing the word Google, "Just Google it," demonstrates the platform's acceptance in the role of clarifying or conveying meaning for general concepts. Google Images provides a visual conceptualization for general or specific notions. However, these meanings and visual conceptualizations might also convey divergent or contradictory meanings. This study examined food systems' elements using a mixed approach that included semiotics, open coding, and MAXQDA software to organize data, text, and multimedia, facilitate the analysis, and produce a snapshot of the findings. The guiding questions for the study were co-created with the participation of the farmers. For example, how do people see the context in the meaning attached to food systems? How do different food systems deliver messages or meaning, and what are the impacts of such messages?

The Semiotic Pentagram Framework developed by Cordeiro and Filipe (2004), built on Stamper's Semiotic Ladder and other semiotic frameworks, was used to compose a more integrated snapshot of the conceptualization of food systems. The Semiotic Pentagram Framework takes the object of analysis, in this case, food systems, and explores its semiotic sign, which is the 'image' of food systems, utilizing keyword search results. Their respective Google Images results as the semiotic signs.

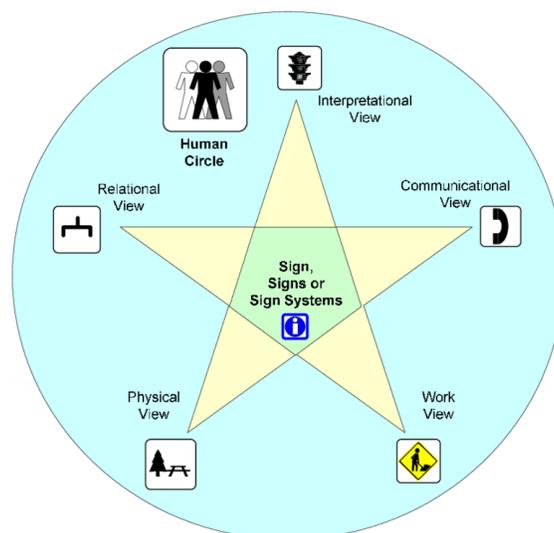


Figure 7. The Semiotic Pentagram Framework. (Cordeiro & Filipe, 2004).

Cordeiro and Filipe's (2004) Semiotic Pentagram Framework considers five distinct aspects or views shown in Figure 3, enclosed by what the authors call the "Human Circle,"

making this broad semiotic framework convenient in analyzing complex systems. The Human Circle encasing the pentagram supplies the human dimension to the framework, underlying each view into the object of analysis (food systems). First, the “interpretational view” concerns passive interpretation and meaning-making. Interpretation is crucial for all sign analyses. The human circle has the role of interpreter. Second, the “physical view” studies the physical part of signs or the channel where signs might be carried. The human role is simply technical and has little weight in this view. Third, the “relational view” concerns the links between signs, among their apparatuses and between different sign systems or texts, taking the interpretational view into account. This can include syntax, regulations, norms, genres, and conventions. Here, the human circle is vital and should identify the people affected and responsible for these relationships. It also should consider the context. Fourth, the “communicational view” involves the conception of signs, the message intended, their channels, the identification of the sender and receiver, and their representational power. The human roles are the ones of sender and receiver of the communication. Fifth, the “work view” concerns how the context is shaped, affected, or changed using signs. The human role here is investigative and interpretative. This view can map the use of signs to influence social contexts “with a misleading view of the use of signs for other things other than communicating” (Cordeiro & Filipe, 2004, p.14).

Literature review

This delineation explores the ever-changing food systems as a concept and conceptualizes the relations within agricultural systems. Understanding a system is necessary to describe and analyze the components and actors and their interactions, such as the interactions between producers, distributors, and consumers, which can be materialized between individuals or organized societal bodies or institutions. Based on Ericksen's (2007) conceptualization, the Oxford Martin Programme on the Future of Food defines a food system as “a complex web of activities involving the production, processing, transport, and consumption.” The concept of food systems is often divided into conventional and alternative food systems.

Food Systems

How societies recognize food systems can affect individual food choices and dictate governmental expenditure. For many, our food system is partially invisible, a commercial exchange, where no thoughts are given about the whole system, no questions about where it came from, how or who produced it, how it got there, how it is disposed of, or who has profited by it. However, in the past decade, some consumers' relationships with food suppliers are changing from unquestionably enthusiastic to curious or even skeptical, where questions on health effects, ethical responsibility, the environmental footprint, and beyond guide their food choices. The global, national, and local food systems' perceived image might materialize independently of individual food choices, usually influenced by access, preferences, nutrition value, and environmental aspects. As a starting point, the literature review explains the two sides of food systems, agribusiness, and family farming, in the global and Brazilian contexts. The guiding questions brought by family farmers and the literature from a preliminary enquiry regarding how the perceived concepts involving food systems can affect small farmers. The study focused on constructing the public's perceived image and idealizing food systems. It also explored how these perceived images have materialized in sometimes radicalized food choices. Finally, this study

connects written and symbolic concepts offered by digital platforms as they play a significant role in shaping ideas and can guide social organization patterns. The result provides a conceptual snapshot album on elements of the food system focused on the Brazilian scope.

Exploring the Brazilian Agribusiness Concept Construction

In Brazil, the Ministry of Agriculture, Livestock, and Supply (MAPA) manage public policies to encourage agriculture. They aim to promote agribusiness and regulate and standardize services linked to the sector. Agribusiness includes small, medium, and large rural producers. It brings activities to supply goods and services to agriculture, agricultural production, processing, transformation, and distribution of agricultural products to the final consumer. MAPA's mission is to promote the sustainable development of agricultural production chains to benefit Brazilian society. (MAPA Gov. Institutional).

Rufino states the concept of agribusiness arose from integrating agriculture with the industrial sectors of supply of inputs through production, processing, and distribution. It covers all transformations associated with agricultural products. In this sector, the use of technology is intense, not restricted to the rural field, but also present in the industrial area with seeds, fertilizers, pesticides, and other agricultural inputs. (EMBRAPA, Rufino, 1999).

In the past two decades, environmentalists and consumers have challenged agribusiness' ability for continuity if their operations use unsuitable agricultural practices. Other consumers' concerns relate to the adverse health effects of consuming their products. Others question the ethics of food choices and systems. The global food system operates through a complex and institutionalized worldwide apparatus that involves governmental and non-governmental institutions. The labour and costs of production are passed on to consumers and farmworkers. At the same time, corporations retain all the profit in the agricultural sector. They also shape every aspect of the food system, from production to distribution to waste management. Their influence is broad, and their power is hegemonic. The industry participates in policymaking, implementing national and international laws, and influencing science to undermine the adverse effects of industrial agriculture. The industry also engages in the promotion of trends or eating habits.

The claim of the necessity for a globalized food system is centred on the contradictory assertion that it is the only way to feed the world, an idealized solution created and promoted as agribusiness justification to the public. Nevertheless, in Shiva's (2014) opinion, this is a bold claim, impossible to sustain, given the social, economic, and environmental costs of implementing industrial agriculture.

Heffernan's conceptualization of the industrial food system resembles an hourglass "... in which farm commodities produced by thousands of farmers must pass through the narrow part of the glass that is analogous to the few firms that control the processing of the commodities before the food is distributed to millions of people in this and other countries" (Heffernan et al., 1999, p.1). The industrial food system framework has more resemblance with a factory line than it does with a farm. It is not necessarily a means to produce and distribute food. Nonetheless, it is a business pressured into continuous profit increase. Therefore, neither public nor environmental health is its purpose. Both Heffernan and Shiva further imply that industrial grain farms, such as those that produce soy, wheat, and corn in State-sized monoculture farms, do not need many

farmers to operate. Due to the standardization of cloned seeds, crops are automatized, grains are intended for export trade, and processing plants are divided into three main categories: animal feed, biofuel, and processed foods. However, there is also labour-intensive farming of fruits and vegetables done by small farmers, making small farmers increasingly dependent on the industrial system, either by selling their produce to agribusiness or as buyers of agricultural inputs to produce them. Expanding on the hourglass analogy of Heffernan et al. (1999, p.1) for an updated expression of the globalized food system's stakeholders, figure 8 portrays an image of a disproportional model. The narrow part of the glass represents the profit presently shared by corporations that manufacture and sell agricultural input, food processing plants, and large retail chains. A dozen corporations control the global food system from production to distribution.

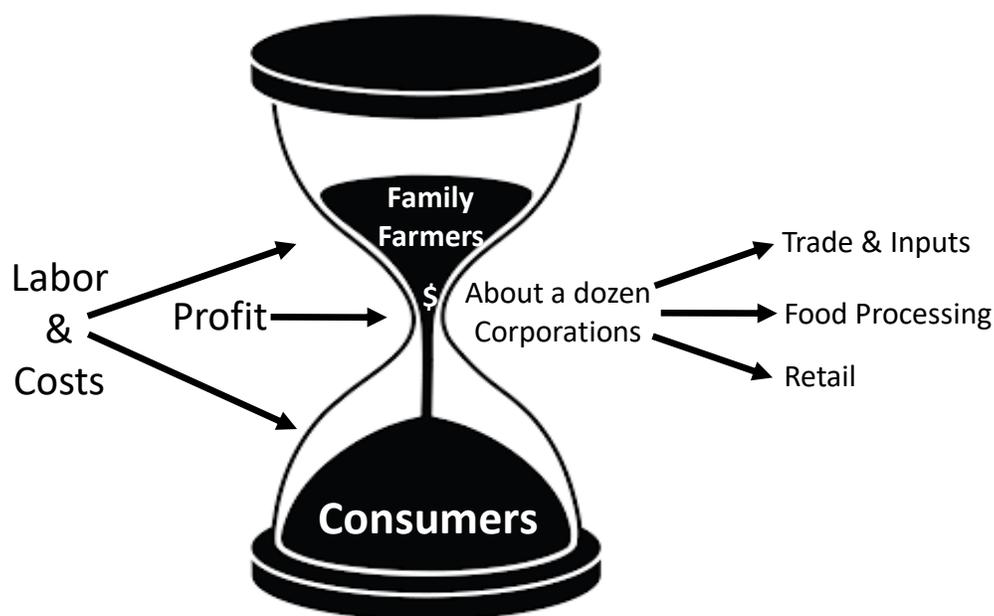


Figure 8. Commodity Factory.

Although Heffernan's et al. (1999) work refers to a North American experience, the structure is similar worldwide. The model was exported worldwide and sold to countries on credit as the “Green Revolution” package implemented between the 1960s and 1970s.

The agricultural modernization process in Brazil brought changes in the economy, social structure, and political views. Gaio (2008) researched the conceptual understanding of the political modernization brought by the cooperation between the Brazilian Ministry of Education (MEC) and the United States Agency for International Development (USAID). The author explained that the introduction of modern technology in a traditional and agricultural society alters the current opinion in that society on the three main spheres of the government: 1) The development probably provoked a new statement on the country's international position evolution. This is because nations have often broken free of traditional standards and accepted the burdens and opportunities of modernization in response to interference from more advanced societies, be it military, political, or economic interference; 2) Modernization brings new hopes about the level of wellbeing. At the same time, it falls on governments to create the initial conditions for industrial growth. The performance of these tasks, in turn, requires the State to

learn how to collect greater resources through taxation and that society accepts this collection; and 3) Modernization tends to shift the balance of power and influence in society, moving it away from rural areas towards cities, closer to those who can manipulate and manage the instruments of modernization (Gaio, 2008, p.101).

To fulfill the participation preconditions for the agreement, most underdeveloped nations had to devote a large part of their resources to the modernization of three sectors: fixed social capital, agriculture, and sectors that attract foreign currency. These changes were part of agreements made during the Brazilian military regime. Critics of the deal claimed they anticipated the privatization of higher education by copying US models. They feared the subordination of education to the immediate market's interests, the emphasis on math and sciences to the detriment of the humanities, and the elimination of gratuity in universities. (Alves, (Favero (1977); Goertzel, 1967). One of the changes brought by the agreement was the abandonment of teaching agroecology principles at Brazilian universities.

Another way the global food system can reach worldwide is by subsidizing cheap industrialized food dumping into local markets as international aid or international development programs. When that happens, small family farmers become unable to compete. They are pressured to join the industrial model somehow—for example, supplying large amounts of one specific kind of potato for a fast-food restaurant chain, requiring intense monoculture with chemical inputs. To do so, small farmers would need a significant initial investment.

In some cases, this option is possible through government-facilitated loans. The model requires high input, and the result is a high yield. The premise here is that a high yield would translate into increased profit. However, farmers have little say in the commercialization and trade of commodity crops or the commodity economic conditions defined by globalized trading systems. The price and availability of inputs are indispensable for the industrial agriculture's successes and are also beyond the scope of family farmers' concessions. Shiva (2014) stresses that the Green Revolution and the current corporative genetic engineering regime sold as "intensive farming" is a deceptive impression, as the intensiveness of this regime is towards its inputs. Industrial agriculture is chemically fossil fuel intensive and capital intensive. These translate into soil and water contamination, greenhouse gases, and small landholder and family farmers' debt. The dependency on the chemical inputs only grows with time. In monoculture industrial production, pest resistance increases, and soil fertility decreases incessantly. Thus, even when government incentives are present to get small landholders into industrialized agriculture, small family farmers enter a cycle of swollen debt and impoverishment.

Darrin Qualman wrote in 2011 about agriculture in Canada, a country known for its well-established agriculture and considered a dominant food producer worldwide. Qualman exposed that the total value of food products grown in Canada since 1985 is three-quarters of a trillion dollars. The net income from the small and medium Canadian farmers for sold produce averages zero dollars (Qualman, 2011). According to Qualman, in Canada, not most but all the profit made in agriculture stayed within the narrow portion of the hourglass. Agribusiness seized all the value, while farmers carried the labour and were left to live off-farm employment and taxpayers' assistance programs. This revealed a deeply dysfunctional agricultural framework. Mikawlawng et al. (2014) highlighted that the agrarian crisis in India had assailed another great food producer country, driving thousands of farmers to commit suicide due to accumulated debt, much of it

caused by high-cost chemical inputs. One of the largest food exporters globally, Brazil is also marked by contradictions, plagued by hunger, environmental devastation, drought, and unequal land access.

The corporate food regime was allowed to develop a giant multifaceted, multinational framework of institutions that work under international regulations and disrupt the state's sovereignty in regulating domestic markets. Countries became the largest private banks debt holders, especially in the global south. Currently, these corporations are increasingly operating in the “direct creation, application, and enforcement of international law, through the representation of governments that support the expansion of corporate rights” (Cerny, 1995, p. 618), making corporations more sovereign than the State. The centralized food system “was never voted on by the people of this country, or for that matter, the people of the world. It is the product of deliberate decisions made by a very few powerful human actors.” (Heffernan et al., 1999, p.16). Two decades after Heffernan et al. first expressed concerns; the once-emerging power is now a well-established hegemony.

Family Farming

The Secretariat of Family Agriculture and Corporatism (SFAC), now under the unified Brazilian Ministry of Agriculture, defines family farming as a form of social, cultural, economic, and environmental organization in which family-based agricultural and non-agricultural activities are conducted and developed in small or medium-sized rural establishments attending local and regional markets. They are managed by a family or by family labour, where the farmer has a special relationship with the land as their place of work and residence. The 2006 Census found that most establishments in this sector do not use agricultural chemical input, particularly those in the North and Northeast (IBGE, Census 2006). Crop diversity is also a hallmark of this sector.

To receive public support from SFAC, family farmers in rural areas must meet four criteria. First, the farmed land area varies significantly from municipality to municipality, requiring an area between five and 110 hectares. The measure also depends on the availability and conditions of production. Second, the land use must be for family labour in rural economic activities. Third, the primary family income must originate from rural economic activities in their establishment. Fourth, farmers must manage their establishment or enterprise with their families. Until 2016, the family agriculture segment classification comprised agrarian reform settlers, beneficiaries of the National Land Credit Program (PNCF), quilombola and Indigenous communities, artisans, artisanal fishers, fish farmers, and foresters, among others. The identification of family agriculture for access to public policies is made through registration in the Declaration of Aptitude to Pronaf (DAP) (MAPA), Secretariat of Family Agriculture, and Corporatism. This organizational process has a critical role; it gives food-producing families a semi-formal status allowing them access to programs and government support previously reserved for formal organizations.

The fight for recognition of peasants' values has been long and violent. The 1990s were marked by violent peasant struggles and changes in Brazil's institutional, agricultural structure. Numerous land occupations by peasants' movements created conflicts between producers and peasants. La Via Campesina, the largest global peasant organization, was built in 1993 with the Landless Labor Movement (MST) as a founding member. In Brazil, the MST demanded

government action to create an institutional body representing family agriculture. According to the MST, MAPA historically acted in favour of agribusiness 'producers' and against the interest of peasants. The increase in MST actions in the 1990s eventually resulted in several violent conflicts, including two massacres, one known as the Corumbiara in 1995 in the State of Rondônia and the other known as the Eldorado do Carajás massacre on April 17, 1996. In addition, the agricultural census was published and provided the first information on the size of family farming in Brazil and noted some difficulties the segment faces (IBGE, Agricultural Census 1996), granting more substantiation to the claim for more support. Finally, the MDA was established in 2000. The MDA was created as an institutional umbrella of representation and support for the development of family farming.

According to a report produced by the MDA for the consolidation of public policies for strengthening family agriculture and using the 2006 Agricultural Census, one of the factors contributing to the reduction in the performance of family agriculture is the public perception that family farming is small and archaic. The report hypothesized that public perception also contributed to the decline in the prices of primary products sold directly by small farmers and strained access to infrastructure and services. These consequences make it challenging to organize farmers, devalue the rural environment and exclude family farming from institutional support and resources available for agriculture. Furthermore, the report states that family farmers experience difficulties accessing formal and informal education, limiting their ability to rise socially and economically (MDA, 2006). Therefore, the new ministry began to develop multifaceted policies and programs to remedy the various obstacles and provide support for developing the segment.

The alternative food movement has seen a resurgence of farmer's markets, Community-Supported Agriculture (CSA) baskets, and other forms of direct marketing between farmers and consumers, as well as solidarity-based exchanges happening everywhere. There is a revival of traditional food preservation and skill-sharing about all food-related topics. New branding of exclusive diets, some are oriented by production methods, while others are based on isolating food groups regardless of production models, and others follow detailed ethical guidelines. This pool of alternative foods sometimes resembles a subscription, and they commonly have an idealized image of lifestyle attached to them. This social delimitation might offer some epistemic justification for why the umbrella of special diets and production methods is referred to as part of the alternative food movement. As the Cambridge dictionary states, "alternative is considered unusual and often has a small but enthusiastic group of people who support them" (alternative). It could also be understood as one that can be used instead of another considered more conventional. Arguably, in the case of family farming, the qualification of alternative gives the segment a marginal connotation, a dispensable inference, or even a characteristic of a specialty niche instead of the traditional ancient profession that kept adapting throughout history. On the other hand, agribusiness is easily recognized as significant, vital, or conventional.

When and why did family farming become an alternative model of agriculture? Less than a hundred years ago, most people lived in rural areas and either produced their food or consumed mostly local food production. In 1940, only 31% of the Brazilian population lived in cities. Since the 1950s, urbanization has intensified in Brazil with the industrialization and green revolution. As a result, more than 80% of the Brazilian population lives in cities (IBGE, Censo Demográfico). The concentration of land and industrialization of agriculture displaced millions of

farmers and changed how we grow food, distribute, and eat. “Foods that may look familiar have been completely reformulated. What we eat has changed more in the last forty years than in the previous forty thousand.” (Schlosser, 2001, p.7). Why family farming became associated with the alternative model in academia, or the mainstream opinion is less obvious, perhaps because the assertion is contradictory.

The scholarly debate is centred on the harmful effects of neoliberalism, food accessibility or the well-being of small farmers, and the environmental footprint of industrial agriculture. It has focused on the consequences of the now “conventional” and central model of agriculture known as agribusiness. Even when acknowledging its negative impacts, there is not enough questioning about why we perceive agribusiness as central. It is like agribusiness was unavoidable and inherently unfolded in the natural course of human evolution. We are only now mapping how complex and globalized the food system is in all segments of society. Authors such as Marion Nestle, Philip McMichael, Nicole Faïres, and others wrote extensively, explaining what this industry has created to sustain its enabling environment through colonization and imperialism by influencing public health organizations, marketing, lobbying, and politics. Thus, as Heffernan et al. (1999) concluded, it is possible to infer nothing accidental or natural about it. It is the logical result of specific political and economic choices a handful of people made.

The outcome of family agriculture is not marginal. According to the 2006 Brazilian Census, family agriculture produces 70% (IBGE, 2009) of the food Brazilians eat. Family agriculture is also not unconventional or considered an antithesis of contemporary technology. On the contrary, although they have been denied access to it, they are the inheritors of one most traditional occupation. Thousands of years of accumulated knowledge are now at risk. According to the IBGE (2009), the 2006 Census was innovative. It introduced electronic data collection and changed the methodology, incorporated a better characterization of the farmer, including income, and enabled the delimitation of the production of family agriculture. In an interview conducted by Cátia Guimarães, Professor Sergio Schneider talked about the role of the 2006 census relating to the validation and conceptualization of family agriculture. The author stated that by complying with the law of family agriculture for the classification of the establishments into two groups: family farmers and non-family farmers, “the 2006 census showed one thing that we technicians already knew but that Brazilian society did not: that small-scale agriculture contributes in an incredibly significant way to Brazilian agriculture”. (Guimarães, 2017) [own translation].

Family agriculture accounts for 86% of agriculture establishments, generates 35% of GDP [Gross Domestic Product] and provides 70% of jobs (IBGE, 2009). However, Schneider added that the publication of the 2006 census results bothered agribusiness to the point that the National Confederation of Agriculture and Livestock (CNA) hired the Getúlio Vargas Foundation to do a focused study to challenge the relevance of family farming. (Guimarães, 2017).

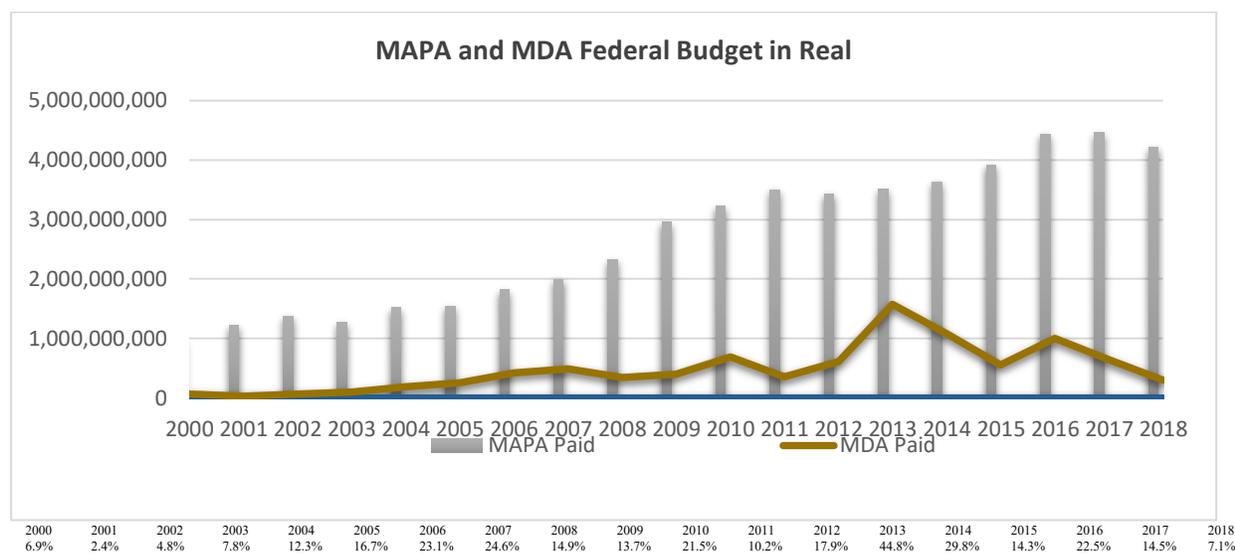
Agribusiness has been under increased scrutiny in the last decade, especially concerning the adverse effects on public health and the depletion of natural resources. Therefore, a reminder that family farmers produce most Brazilians' food would not be in the agribusiness's best interest. The Brazilian Agriculture Census was first scheduled for 2016, ten years after the last one. However, the 2016 census suffered a 70% budget reduction. It was postponed and adjusted, including a reduction in the number of questions in the survey and marked the returned focus on the year-crop relationship.

In contrast, questions that characterized details of the production of family agriculture were removed from the census (Guimarães, 2017). The IBGE justified the decision stating it was due to cuts and national economic crises (IBGE, 2017). In the article, “Who produces food for Brazilians? 10 years of the 2006 Census,” Mitidiero et al. (2017) questioned how a country claiming to be the biggest barn in the world, so proud of the sector's status and the surplus in the trade market, is not outraged by the delay and uncertainty of the most crucial statistic for the sector? The authors concluded that “the revelations obtained with the Agricultural Census are not of interest to agribusiness and may even constitute a threat to this sector.” They added that it is in the interest of agribusiness that the 2017 Census be a lacerated and obscure database.” (Mitidiero et al., 2017, pg.10). Professor Sergio Schneider also acknowledges the importance of considering current political disputes. “The Census became a battlefield between agribusiness sector and the family farming sector.” Some census questions changed what qualifies a family farmer. The changes resulted in some family farmers being categorized as conventional or non-farmers. One example of this change was a low limit on the amount of remuneration allowed per year during the offseason. This change diminished the relevance of the sector. Hence, from the conclusion of Guimarães (2017) and Mitidiero et al. (2017), it can be inferred that the importance of family farming had been purposely obfuscated in the 2017 census, and its changes were politically motivated to represent agribusiness private interests.

The Brazilian Federal Expenditure in Agriculture

This portion highlights the federal budget dedicated to the two sectors of agriculture previously discussed. The information was obtained through consultation of the Painel do Orçamento Federal, Federal Budget Panel, a consultation platform from the Brazilian Federal Government. Figure 2 compares the expenditure of the MAPA, the ministry that represents agribusiness (vertical bars), and the MDA, the ministry that represents family farming. The comparison was possible because the Ministry of Agrarian Development (MDA) and MAPA had separate budgets. The MDA was extinguished in 2016. Thus, the data shown for the years 2017 and 2018 were executed by the Special Secretariat of Family agriculture created by the interim administration of President Temer. The graphic represents eighteen years of public budget expending from 2000 to 2018, the last budget year where information was available for the two segments separately. Hence, currency inflation can be disregarded. In 2000, during the conservative federal government, the expenditure for the MDA was around 7% of the value assigned to the MAPA. Halfway into the period observed in 2009, during the worker's party federal administration, the MDA budget was 20% of MAPA's expenditure. However, at the end of the time series in 2018, after the termination of the MDA, the Special Secretariat of Family Agriculture spent only 7% compared to the amount paid to support agribusiness. The MAPA budget grew steadily during the entire period observed. MDA spending grew significantly from 2003 until 2014. The federal budgets are now unified, and the MAPA oversees both agricultural segments.

Figure 9. MAPA and MDA Federal Budget in Real



Another observation about the two budgets is regarding the expenditure function. The MAPA's most significant expenditure after administration personnel (34%) and pensions (24%) was on the accounting function called "Promotion of agrarian production," (12%). During the same period, the MDA's expenditure was as follows: "Promotion of agrarian production" (0.4%), administration personnel (6%), and pensions (0.001%).

Results and Discussion

This discussion integrates the conceptualization of food systems situating it in the literature, its portrait within mainstream media, and farmers' understanding of its concept. The exploration of agriculture concepts results from analyzing the literature and federal budget data, the messages communicated through informal sign systems, and the farmers' understanding of these concepts obtained from interview responses. In addition, the analyses aim to investigate the meaning of Brazil's two main agriculture segments, focusing on the RN State.

The Semiotic Pentagram Framework takes the object of analysis, in this case, food systems, and explores its semiotic sign and sign systems. The semiotic sign is defined as "something which stands to somebody for something in some respect or capacity, in some community or social context," a sign by Charles Sanders Peirce improved by Ronald Stamper to add the essential social context. (Stamper et al., 2000. n/p). Signs can be used to communicate norms and extend their actions into the past and future, "a norm is a generalized disposition to the world shared by members of a community." (Stamper et al., 2000. n/p).

Visual Capitalist, a media site that creates data-driven visual content measured the most visited websites worldwide. Wikipedia.org is fifth with six billion visits per month. With 92 billion visits a month, Google is the most consulted website globally, followed by Youtube.com,

Facebook.com, and Twitter. These websites are at least partially dedicated to conceptualized presentation. The five largest platforms provide more access than the remaining 45 websites (Visual Capitalist, 2021). Most of these platforms are profit-based shareholder trade companies. Wikipedia is a non-profit foundation categorized as an encyclopedia and dictionary. However, it is an open platform. Anyone can create and edit its content. The impressive number of consultations demonstrate the platforms' relevance and dominance in the general construction of concepts. The way people perceive concepts influences how we assign value. Value, in turn, can determine what we do.

The sign system analyzed here is comprised of the keywords “*agribusiness*” and “*family farming*.” It also considers its textual definition and the equivalent image representation of that keyword. The first eight Google Images that resulted from searching keywords were viewed to form the visual aspect of the maps. After the central sign keyword, complementary searches for the elements shown on the first results produced a more detailed visual representation using the Semiotic Pentagon Framework as a guide to include the interactions and connections of elements involved in the concepts. Since web representation is everchanging, for reference to the period analyzed, the images were accessed in December 2020, clearing computer “cookies” before each search to produce a less biased portrait. Formally known as an HTTP cookie, a web cookie refers to data that a computer stores when a user accesses the internet. The purpose of computer cookies is to keep track of user visits, activities, and interests, which can adjust search results according to user interests recorded by web cookies. (Web Cookies, Wikipedia, 2020).

The conceptualized appearance offered by Google Image for the keywords “*sistemas alimentares*” [translated to “food systems”] below portrays the elements of food systems and the path food travels from production to waste. One of the images defines a food system as a set of activities related to the production, processing, distribution, preparation, consumption, and disposal of food, which affect health, socioeconomic issues, and the environment. Wikipedia also defines food systems as including all processes and infrastructure in feeding a population. Most images portray linear systems, while a few suggest a circular approach.

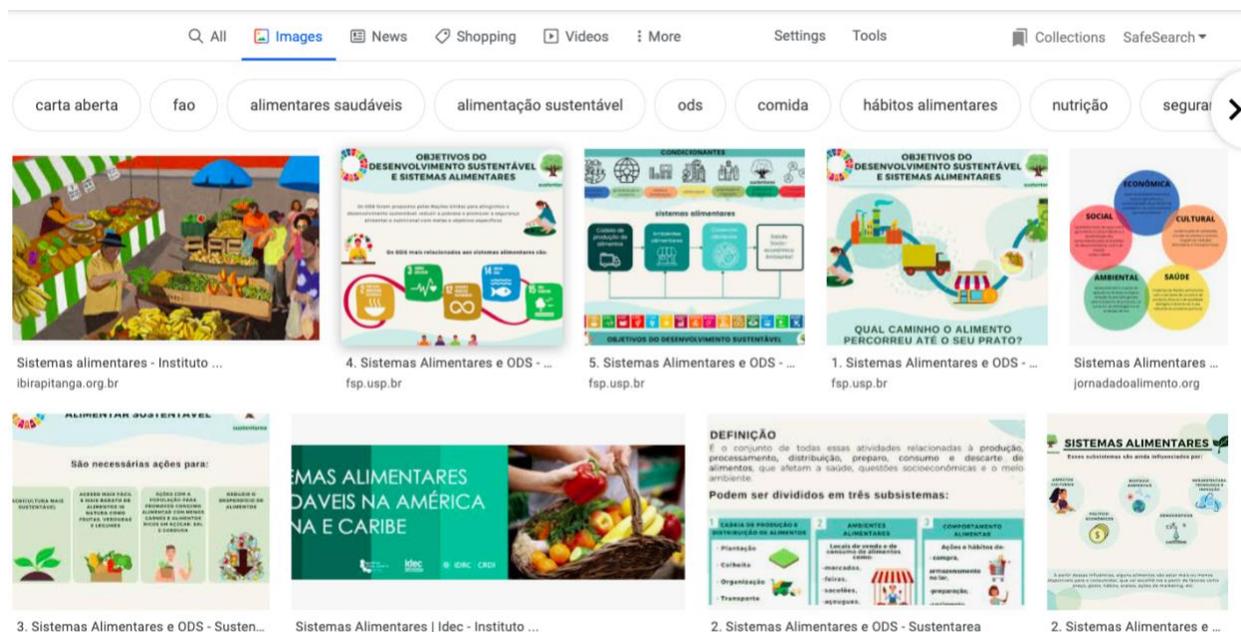


Figure 10. *Sistemas Alimentares.*

Agribusiness

The first results from a Google search for the keywords “agrobusiness significado” [translated to “agribusiness”] brought a Cambridge dictionary definition stating that agribusiness is “the different types of businesses involved in farming, such as growing crops, supplying seeds, manufacturing farm equipment, and marketing farm products.” Continuing “...farming using modern equipment and methods, considered an important industry.” Among other online dictionaries, a Wikipedia article defined agribusiness as “the combination of countless activities that directly or indirectly involve the entire agricultural or livestock production chain” (my translation). This generated semiotic pentagram explores and identify the connections and different views within the sign system found.

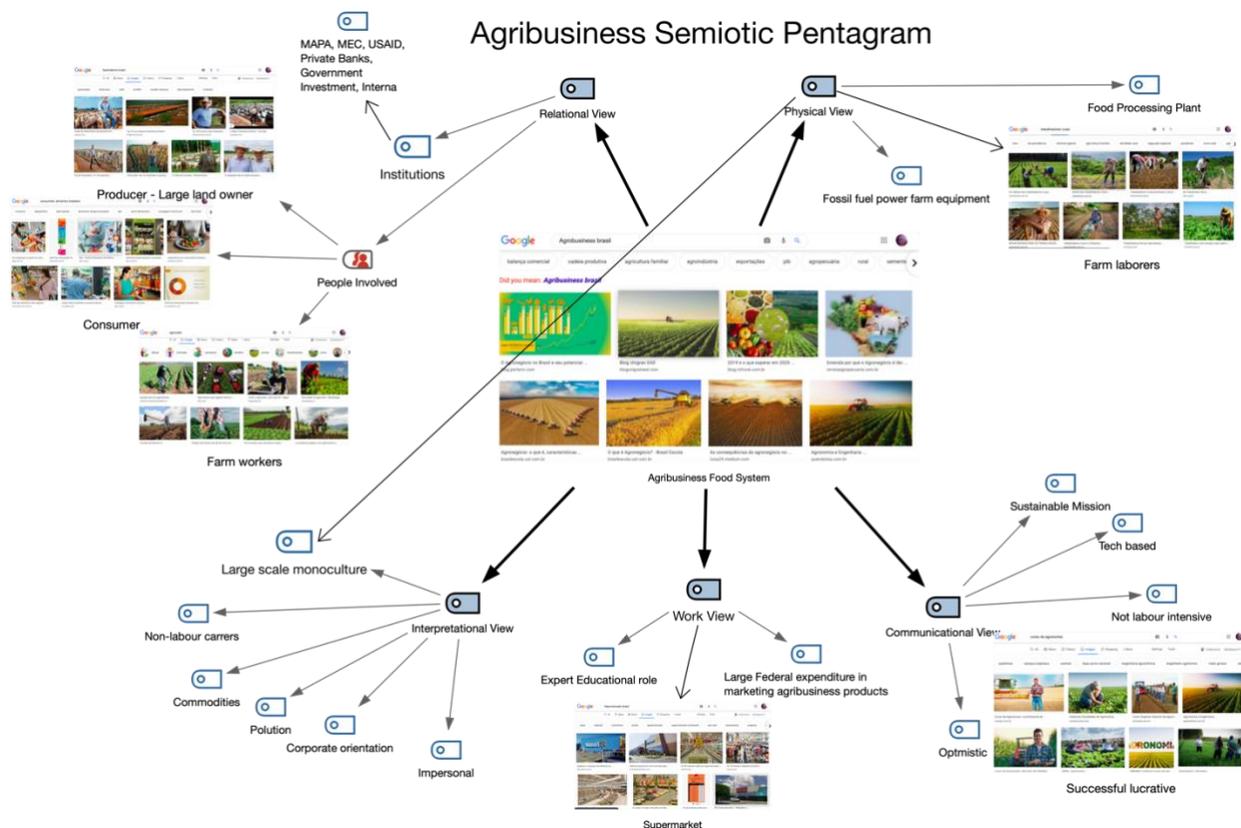


Figure 11. Agribusiness Semiotic Pentagram.

The following items define the five views as in Cordeiro and Filipe's (2004) Semiotic Pentagram Framework, which considers different aspects or views to support agribusiness analysis as a sign system.

1) The interpretational view conveys a passive interpretation of the meaning portrayed by agribusiness. The Google Image first search result shows how much the industry produces with only a few different types of commodities on a graph, focusing on profit. Most images are of large-scale machine-operated (fossil fuel pollution) monoculture farms, passing an idea of a sizable, organized, and neat industry.

Two out of eight images picture actual food, exclusively unprocessed food. However, there are large monoculture farms in the background of the same images. The other image has the map of Brazil as a background. These two images portraying food could be interpreted as a deceiving representation of what is produced by large monoculture since grain farms are pictured and how most fresh fruits and vegetables are produced in the country.

The Brazilian map represents the importance of agribusiness for the country, both as a food provider and economic power. This perceived image is partially misleading since agribusiness focuses on export. Although its dictionary definition and the literature describe agribusiness as the universal food system, many essential elements are not depicted. For example, there are no images of processed foods, distribution, factories, food waste, or consumers.

2) The physical view uses the interpreted view and image to identify the physical part of signs, the channels, or ways an idea might be performed. For example, the machine-operated farms pictured can infer dependence on fossil fuel. The factory and production plants behind the food processing are not directly pictured. However, they can be inferred from the silos and smoking industrial flues appearing on the graph in the first image, which presents the monetary outcome of large-scale monoculture.

A corresponding keyword search was conducted to depict “agricultural labour” needed as a physical means of production in the industry but not in the images. The Google Image result portrayed the labourers as all-male, ethnically diversified farmworkers working on what appeared to be small, medium, and large farms. The graph showing the export of commodity crops suggests food distribution is global.

3) The relational view considers the interpretational view, including syntax, regulations, norms, genres, conventions, institutions, and people involved. Institutions are heavily signified in agribusiness relations. The central institutions identified in the literature and results are the MAPA, MEC, USAID, private banks, government investments, and international development agencies. The people relations are the affected, the beneficiary, or the people responsible.

The relationships between the signs explored were composed by interpreting complementary image searches and analyzing the syntax and conventions from the literature and interviews. The people involved are presented here as producers, consumers, and farmworkers. The Google Image result for “*fazendeiro*” [translated to “producer”] represented predominantly by white males, non-labouring individuals standing or posing next to an extensive monoculture farm background.

Google Image depicts “food consumers” predominantly as white women browsing supermarket aisles of industrialized food products. A search for “healthy food consumer” shows a more diverse set of images, such as farmers of all genders offering produce, farmer's markets, etc. For example, only one out of eight images was of a supermarket aisle of dried pasta. Similarly, the “healthy food consumer” pictures were primarily white women.

4) The communicational view involves the conception of signs with the message intending that agribusiness is or at least could be understood as interchangeable with agriculture or food systems. Agribusiness is large, economically significant, and based on technology and formal education. The images represent an organized, well-ordered, lucrative operation with a sustainability effort. The Ministry of Agriculture hints at the latter on the stated agribusiness' mission that includes sustainability (MAPA: Mission).

Communication channels embody a private and governmental authority, such as agencies related to the national economy, political lobbies, national and international banks, and national TV programs. The message's sender is not clearly stated, but the images suggest that large institutions of authority messages are channeled through private owners. The intended receiver is food consumers and constituencies since the message or the concepts presented barely focus on typically related food concepts, such as produce, or the act of eating, cooking, flavour, health, nutrition, or family gatherings.

The power representation in the communication seems broad-spectrum, top-bottom, and one-way, as the sender and receiver do not have the same access to communication channels.

5) The work view context, shaped by the sign system of agribusiness, represents an image of an oversimplified system. It promotes a misleading view that focuses on the economic benefits of the system while omitting its environmental and social costs.

The central image does not hint at the labourers or where a particular food comes from, nor does it show any hint about food processing, which is the bulk of this sector's products. Food consumers are represented by supermarkets' isles, a way to access food derived from association with agriculture.

Governmental institutions heavily fund the enabling environment. The institutional support is multifaceted and can be seen in promoting food products from the agribusiness sector and influencing agronomy education curriculum development to exclude agroecology and focus on large-scale high input farming.

Family Farming

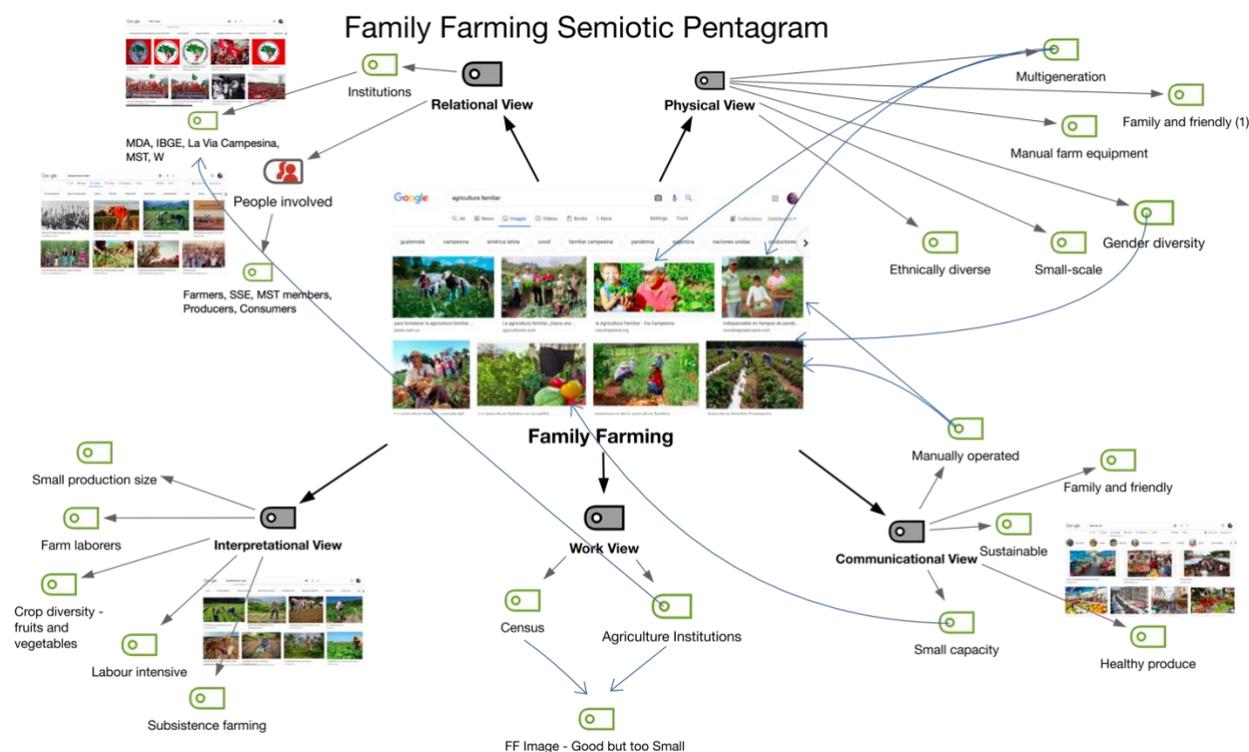


Figure 12. Family Farming Semiotic Pentagram.

The following items define the five views as in Cordeiro and Filipe's (2004) Semiotic Pentagram Framework which considers various aspects or views to support the analysis of family farming as a sign system.

1) The interpretational view concerns the passive interpretation and meaning-making from the family “farming” conceptualized image as a sign system. Family farming, as represented by Google Images, displays the first eight results consistent with different photos of small farms being worked by families. The suggested production size is shown, as family members use handheld crates or wheel barrels to carry the diversified produce. The depiction of a small outcome and manually operated multi-crop farm passes an idea of a subsistence, labour intensity, informal arrangement where no system process is apparent and is a non-industrialized operation.

2) The physical view offered by Google Image is narrow. All pictures refer to the production of fresh produce, fruits, and vegetables, with no suggestion of the channels where signs might be carried or who else besides the family unit is involved. The images are composed in an idyllic manner where the people involved seem happy, ethnically diverse, and multigenerational. No images suggest food processing, distribution, and sales, or production surplus. There is no apparent association to other portions of the food system besides production.

3) The relational view is concerned with the links between signs. Considering the interpretational view, families work on small farms in a system that appears contained in the farmstead. Activists from the MST are also pictured in a large demonstration in the Brazilian capital as a search result for “farmer”. A few activists are shown holding sickles, associating small farming with activism or armed rioting. Other links and apparatus that compose the family farm as an agricultural sector are not pictured to show food processing, added value products or market. That absence can be considered revealing. Those links can be recognized aside from the image’s portrait by exploring institutions and people involved in family farming.

The leading institutions identified in the literature and interview results are the extinct MDA, funding agencies, the IBGE, the MST, La via Campesina, and education institutions. The MDA worked as an umbrella that included political representation, interaction channels, technical development, and funding. The IBGE is responsible for an agricultural census and can exert a validation authority. The MST and La via Campesina are large social movements representing family farmers, and universities have recently become involved through extension projects. The people involved are farmers, consumers, development agents, and activists. An “agricultor” [translated to “farmer”] conveyed a similar image to that of “agricultural labour,” which are ethnically diverse workers, primarily male, in small and medium-sized farms. In contrast to the concept of “producer,” which refers to land ownership and agribusiness. A “farmer” signifies the farmworker or small-scale farming.

Google Image depicts “food consumers” predominantly as white women at supermarkets. A search for “healthy food consumer” shows a more diverse set of images, including farmers of all genders and a few farmer’s markets. One out of the eight images were of a supermarket aisle of dried pasta. Similarly, the “healthy food consumer” is pictured primarily as white women.

4) The communicational message portrays an idyllic image of small old-fashioned farming rooted in family, manual tools, and customs that produce food that is widely accepted as healthy and natural. Consequently, this also communicates that the system is more ecological or sustainable. This definition is corroborated by the Brazilian Ministry of Agriculture, which has an official definition for family farming, limiting family farming by size, income, production

Agribusiness's readily available message is focused on the economic outcome of agriculture and the idea of ownership, linearity, and magnificence. The image implies that the profitability of agriculture lies entirely in agribusiness. Family farming also has a consistent expression. However, the focus is on agricultural labour. In both segments, the processes that compose the systems that deliver those outcomes are primarily absent from their façade. The binary symbology gives agribusiness an oversimplified view that highlights their economic outcomes and hides social and environmental costs. The oversimplified view of family farming diminishes its role in agriculture and reduces the perceived economic impacts of its outcome. It also suggests that their lack of technology use is an idealized choice.

The demonstrated perception cannot contribute to the development of food systems towards the betterment of human welfare, neither for the consumers nor the family farmers. As our food systems diversify and the alienation of food consumers increases, the questions regarding both individual food choices and political, agricultural direction choices become complicated. The rise of specialty diets focuses on personal, ethical, or healthy food choices and labels such as vegan, organic, paleo, or sustainable. Suppose we associate family farming with the idea of healthy food production and agribusiness to technology and economic profitability. How would we classify an organic high input large monoculture run by a family unit? How about the small family farm part of a cooperative that envisions technology access and expansion to regional or national markets? As the census qualifies them by size or profit? Or the high-tech urban agriculture that uses underpaid labour and relies on plastic packaging? Is a family-operated more sustainable than a multicultural farm corporation using the latest technology agribusiness? Oversimplification restricted by portrait image and institutional limitations keeps family farming bound.

One possible enabling factor for agribusiness economic outcomes and its perceived positive image can be traced by observing how these ministries promote their sector. The MAPA, which had a budget at least three times bigger than the MDAs, at any given time, invested 12% of its budget in promotion for the observed timeline. In contrast, the MDA has spent only 0.4% of its budget on promotion in the same period (Figure 7. MAPA and MDA Federal Budget in Real). This emphasizes promoting how it might influence the market and how the public perceives the sector. It also demonstrates the need for more public investment to promote and validate of family farming outcomes.

Final Considerations

The mainstream messages observed about the food systems are oversimplified to compose two idealized systems. The impacts of such statements have implications for shaping individual food choices and agricultural policies.

The idealization of agribusiness in the country can be traced to the Green Revolution's implementation time. The phrase "Brazil, barn of the world," was a national slogan in the Vargas military right-wing dictatorship to promote and defend the agricultural policies of the regime. It had the objective of propelling Brazil as the largest global exporter of food. Although this goal was not achieved, agribusiness advocates still commonly used the phrase, especially in promoting

of the economy's surplus and Gross domestic product (GDP). The prominent figures in the Brazilian agribusiness reports and headlines are undoubtedly impressive. However, monetary, social, and environmental costs are behind this prowess. The reason for that is simple. If these reports account for public funding, environmental degradation costs, and social and health impact costs that go into artificially maintaining its successful facade, agribusiness accounts would decrease and leave consumers and farmers paying the bill. The dream and promise of some political leaders to make Brazil the largest barn in the world mean making Brazil the biggest exporter of cheap commodities and the greatest importer of expensive agricultural inputs, and Brazil is almost there. Brazil is one of the few countries that can still significantly expand their arable land and agricultural inputs importing market. Thus, the question is not whether Brazil can become the largest food producer globally. The question is: At what cost and for who?

The idealized image of family farming confines the sector's farmers to what one farmer described as "perpetual smallness." The individual food choices coming from this sector are primarily associated with unprocessed fresh vegetables, widely perceived as healthy but not necessarily the first pick convenience or taste preference. Family farming is a small industry and traditionally or minimally processed products are not automatically pictured except as products of the rich farmer's market niche. The family farmers have little access to the spheres where decisions and opportunities for development are conceived. The conceptualization and communication of the family agriculture sector are also beyond the family farmer's grasp. The message taken from the readily available images observed here seems to have been authored by academics and economists and, more recently, by bloggers and influencers to exclusive market diets.

In countries like Brazil, limitations of concepts can mean limited access to crucial agricultural support from publicly funded programs to the family farming sector, especially during more conservative governments. The government can use conceptualization limitations to justify sector cuts. For example, changes to the last Brazilian Agricultural census included a reconceptualization of what constitutes family farming. They added requirements to qualify a family farmer, such as reduced property size, decreased non-family labour, and non-farming income. Those changes resulted in a validated measure that added to a perceived diminished number of family farmers and reduced production amounts. The smaller results were justified when a conservative administration made significant budget cuts to the family farming sector, reaffirming the association of family farming as a social assistance cost in the national budget instead of an economic sector that needs more investment. In contrast, agribusiness is recognized as the most critical contributor to the country's GDP and worthy of a continuously increasing investment of public funds.

As the world discusses the next agricultural revolution, asserting the research's emphasis on it is crucial. The Green Revolution has shown that investment in agricultural research can have a tremendous impact. The creation of the high input, high yield variety crops increased the GDP per capita by 10 to 44 percent for many large producing countries between 1962 and 2010 (Gollin et al., 2021). Such a feat's socioeconomic and environmental costs are well documented sixty years later. The GDP is still an important economic measure, and profitability in agriculture is a crucial incentive in the sector, not only for agribusiness but also for keeping small family farmers in farming. However, with the current systems, the emphasis on research in the following agricultural evolution should not focus mainly on profitability or increasing yield in a handful of

crops. This no longer translates to increased profitability. Food literacy, the better understanding of the concepts that make food systems, and the development of better communication channels are fundamental in including underplayed actors, such as consumers and family farmers in the evolution of our food systems. Thus, planning and deciding on research investment's priority should involve family farmers and consumers. The outcome should also be to deliver substantial benefits to human welfare. Government participation in funding is vital for agriculture to drive human development and GDP increases because international funds might come with strings attached. However, governments need to develop criteria in collaboration with farmers guided by regional food sovereignty and human welfare and not just follow the same international interest guidance.

7. INTEGRATING SUSTAINABILITY ASPECTS TO GENDER AND SOCIAL NORMS TO GUIDE BETTER FAMILY FARMING POLICIES

Introduction

Latin America has produced incisive critiques of power relations that result from having some of the highest inequality rates in the world. In agriculture, there are active struggles and policy debates pressed by well-organized social movements, such as the Landless Workers Movement (MST), that often propose radical reforms. Although a significant and comprehensive agriculture reform has never occurred in Brazil, social movements do serve as a lever always challenging to move what seems to be a firmly fixed system. Brazil underwent significant changes that affected food systems, concentrated in its recent history. The changes that followed the Green Revolution were spread between the late 1970s, 1980s, and 1990s, spanning economic liberalization and internationalization. The 2000s were more politically divided, with significant policies aimed at family farming and poverty reduction introduced and implemented simultaneously to expand liberal policies benefiting agribusiness. However, since this study is focused on a localized experience, this paper will not address these issues in depth. The following is a dense summary of this complex described by Berdegué and Fuentealba (2014) to position the larger context in which this study's participants are involved.

The past three decades have seen the region: liberalize and open its economy, including its agricultural sector; dismantle numerous public services related to agriculture; redefine the relative roles of the state, markets and civil society in development; nurture a growing number of medium and large corporations, including multinational ones, that play a dominant role in agriculture as in other sectors of the economy; dramatically expand the provision of basic health and education services, including in rural areas; introduce television, radio and mobile phone communications to the majority of rural areas; reduce its population growth; concentrate population in urban centers, including small and medium provincial towns and cities; expand the rights and opportunities of women; re-establish democracies and strengthen the rule of law and the respect of human rights; increase the responsibilities of regional and local (municipal) governments; expand the size, voice, and contributions of organized civil society; deforest vast regions, contaminate many of its rivers and lakes, and further erode its soils, while at the same time experience an awakening of an environmental consciousness and activism on the part of growing sectors of the population. (Berdegué & Fuentealba, 2014).

The guiding questions for this study were how narrative analysis of women farmers could contribute to our understanding of gender and social norms of family farming from the Brazilian Northeast? How can research further the construction of food systems to enable multidimensional integration to create guiding suggestions for regional sustainable development policy? The objectives were to understand how family farming households produce food, generate income, and manage their farmsteads and other spaces. Furthermore, to articulate a guiding contribution to public policies and programs to develop sustainable food systems in the region by exploring present debates and critical issues still current in agricultural and rural development, focusing on

shedding light on multidimensional gender dynamics of sustainable food systems. The report highlighted the importance of two issues central to family farming development there are not always featured in agricultural policy: gender and social norms, explaining the importance of integrating them with sustainability.

Research Design and Methods

The research design used principles of participatory action research (PAR), which consists of community-based action research in which researchers and participants collaborate in the steps of the study. It also allows for solutions to practical problems (Kelly, 2005). In this case, the family farmers, community developers, and funding agents who participated in this study identified the problems and focus of the research. They also suggested how the study results should be used. By applying communities in the elucidations of their challenges, action research studies the effects of action and praxis, seeking ways to promote change to improve the praxis of the participants in a cyclic way (Streubert & Carpenter, 2002). Thus, the results of PARs can provide an approach to more tightly integrating research in developing and disseminating knowledge that is more relevant and easily applicable to the people involved or to guide public policies. The phenomenon studied focuses on the subjective nature of human experience on the praxis of women in family farming in the Northeast Region of Brazil. Therefore, it used mixed qualitative methods.

The study used purposive sampling in qualitative research to support case-oriented analysis, essential to this inquiry (Sandelowski, 1996; Vasileiou et al., 2018). Purposive sampling means selecting the participant's capacity to provide richly textured information and pragmatic considerations. Most participants, including nineteen farmers, a funding agent, and two community development agents, were selected according to their involvement with two cooperative Rede Xique-Xique and CECAFES. These were selected because the first is one of the region's most successful and long-enduring cooperatives. Moreover, it is unique in the region as it was founded and led by women. The latter is the cooperative responsible for the primary public farmers' market in RN.

The data collection and recording process consisted of participant observation and semi-structured interviews in Portuguese recorded in audio and conducted in two instances. In the preliminary research, participants contributed to the planning and co-construction of research problems, guiding questions, and discussing the use of research results. The second portion included discussions about the challenges determined in the first portion as a starting point. However, the focus was the daily praxis of the cooperative RXX. Introductions to the farmers and community development agents were made with the support of the Associação de Apoio às Comunidades do Campo (AACC), a development agency that supports rural communities. They agreed to contribute to the connection facilitation after contacting the researcher. The researcher met with farmers in various locations, including at the CECAFES market in Natal, RN, the RXX market in Mossoro, RN, and during farm visits for interviews and focus groups in the semiarid region surrounding Mossoro, RN.

We used data analysis collected during institutional ethnography (IE) and narrative analysis. IE is a method of social inquiry to analyze "how people's daily activities are hooked up into institutional arrangements and ruling relations" (Norstedt & Breimo, 2016, p.1). Allen

(2017) states that narrative analysis is used to interpret stories told within research to guide the research context. For Allen (2017), this kind of analysis produces diverse yet meaningful interpretations and conclusions.

To delimit the focus of the analyses, the approach combined indicator-based assessment, grounded on the indicators presented in the guidelines developed by the International Fund for Agricultural Development (IFAD), aimed at offering practical suggestions to public programs' designers. "It is about adopting, integrating, and promoting good practices that lead to gender transformation" (Sriram, 2018. p.3). This offers a practical direction to produce research results that the participants could more directly use.

Literature Review

National and local food systems are subjected to sovereign policies and international influences, making for a complex balancing act as their interests collide. In the last decades, researchers have successfully determined many common sustainability issues in agriculture, partly because many issues are caused by global industrial food systems that are more theoretically consistent and standardized than small family agriculture.

Research for Sustainable Food Systems

The common issues, therefore, are well established in academia. Macroeconomically, as the Organisation for Economic Co-operation and Development (OECD) Agriculture, reported, Brazil's main challenges lie in sustaining the productivity and "production growth expected from agribusiness, while ensuring that such growth is reconciled with the country's poverty and inequality reduction objectives and the need for environmental sustainability" (OECD, 2015, p.61). While the first goal of supporting agribusiness has had plenty of government support throughout history, including during the left-leaning administration of the 2000s, the support for the other goals, such as the reduction of poverty and inequity and increasing environmental protection, has been less consistent, with severe cuts being reported from the late 2010s. During the 2000s, according to a guide to agricultural development commissioned by IFAD, the long-standing inequality and poverty in Brazil decreased because of a series of policies and programs that targeted those issues directly, particularly the successful implementation of conditional cash transfers and increased support for family farming and solidarity economy (Wiggins, 2016). With the current global crisis, hunger rises again in Brazil after decades of declining numbers. As hunger in Brazil grew and surpassed previous rates, the Bolsa Família was created. Severe or moderate food insecurity reached 27.7% of the population at the end of 2020, affecting 58 million Brazilians. This is compared to the severe or moderate food insecurity rates of 16.8% in 2004. The combination of the COVID-19 pandemic and an unresponsive government accelerated the biggest increase in hunger recorded since 2014. (Galindo et al., 2021). The food system functions within a context of social, economic, and natural environments with manifold interactions and feedback loops.

Therefore, the performance and the negative effect of agribusiness are more easily measured by market reports that track its inputs, such as the amounts of pesticides, fertilizers, or petroleum-based consumption, and its outputs, which are broadcasted as national pride in annual

commodity reports. On the other hand, studies focused on the multidimensional assessment of local food systems pursuing sustainable development in agriculture are still insufficient and relevant because of their uniqueness and local environments. In addition, local initiatives' studies are more likely to benefit the actors themselves than studies about issues observed from a macro standpoint. This study's contribution highlights the importance of two issues central to family farming development but is not always properly featured in agricultural policy: gender and social norms based on the narrative analyses of farmers from the Northeast Region of Brazil. A narrative assessment presents an approach to research rooted in the interactions between drivers, praxis, and food systems. This research takes a special interest in gender dynamics, social norms, and policy implementation for sustainability and resilience.

Womanism and Sustainable Agriculture

An article by Purvis, Mao, and Robinson about the origin of the three-pillared sustainability conceptualization concludes that the discourse around sustainability is organized around the three pillars without much discipline and does not translate into a comprehensive understanding of sustainability. A common issue with food system models is that they do not put enough emphasis on the fact that environmental protection, social equity, and economic benefits are not three disjointed entities, and composing models without acknowledging their interdependency can result in models too androcentric and anthropocentric to work in practice and used in policies. Local issues and farmers' perspectives should be included and addressed systemically, not separately, to model more adjusted food systems. The female farmers in this study expressed those issues, pointing out their roots in multidimensional domination. Professor Warren explains that the focus on the "domination of nature and the domination of women are interconnected" (Warren, *Ecofeminist Philosophy*, p. 63), linked through a conceptual structure, in which androcentric and anthropocentric expressions share an oppressive conceptual framework embedded in perceiving traditional systems as genderless, thus, disregarding the need for change.

In a previous publication, the farmers denounced how government support is associated with social assistance costs. The heavy public funding of agribusiness is seen as an economic investment. This narrative was used to state family farming is not viable and that cuts to the sector were justified. (Dantas, 2018). This is a misconception. Agribusiness fails are not without social costs. Agribusiness adopts a business standpoint and because of its large scale, its social and economic losses can sometimes trigger national crises without affecting their owner's welfare. The disjoint view of the pillars of sustainability is beneficial to agribusiness as only their positive economic aspect seems apparent. This is not to say family farming does not need social assistance integrated with policies to support production and organization. This only explains that family farmers should have access to direct cash transfers when needed because in food systems composed of small farmers, the social aspect is closely knit, is community-based and centralized in the family unit. Thus, its negative effects become daring to their welfare.

It is essential to actively manage the interconnectedness between the three sustainability principles, especially between women and agroecology in theory and their praxis to address the social aspect of sustainability. Although the preferred term used by the participants to describe their guiding principle was feminism, their narrative perspective is more conceptually close to womanism and ecofeminism since feminism has historical associations with urban white

women's rights. Similarly, their praxis described the multidimensional oppression in womanism literature grounded in the multiple oppressions that "Africana women" historically and currently face since its theoretical perspective is family-centered (Barry & Grady, 2019). According to Mies and Shiva (1993, p.13), ecofeminism is an effort to surpass the dichotomization of the struggles for women's rights and environmental justice, "is about connectedness and wholeness of theory and practice."

La via Campesina expresses sustainability's environmental aspect through agroecology rooted in traditional peasant knowledge and developing social technology towards food sovereignty. To Emma Siliprandi, agroecology as a scientific concept in Brazil is new and began to take hold in the late 1980s with a proposal for dialogue between pure scientific knowledge created in universities and academies and widespread knowledge among the people who traditionally practice sustainable agriculture. However, the author claims that this dialogue has been complex because there is a myth that science can only be done under controlled conditions within academia. Thus, she asserts that a priority in academia in the sector today should be to break paradigms and increase researcher dialogue with farmers because, as she put it, "without practice, the theory is worthless" (Siliprandi, 2015).

Women have historically acquired vast agroecological knowledge, even as farms became more industrialized. Monoculture replaced polyculture practices, and men seized the role of controlling farm "operations" to produce commodities and their revenue. Industrialization further reduced women's role as caretakers and keepers of small gardens for domestic consumption. However, in this role, women preserved the safety of an agroecological relationship with the land. They also recognized their home as the ecosystem from which they could provide food for their families. Pacheco (2002) explains that women functioned as stewards of the land, curating the biomass flows, upholding biodiversity conservation and plant domestication, and demonstrating in many regions of the world a significant knowledge of plant species, genetic, and phylogenetic resources. They were safeguarding the basis of food safety and security through their productive activities or their "expected" natural contributions to society (Pacheco, 2002). As in other roles commonly reserved for women, such as childcare, cooking, housekeeping, and elderly care, their knowledge, and value as stewardship of agroecology are not readily appreciated. This study's guiding question was co-created with the women from the Xique-Xique Network to answer their request to researchers to document their experience that can validate their traditional knowledge and assert their often-dismissed roles in family farming. Their concerns are confirmed in FAO reports (2012) that showed the percentage of women registered as farmers in Brazil was only 13% compared to the total agricultural workers. The last Brazilian Agricultural Census of 2017 showed that 20% of the agrarian establishments were listed as women leaders, a growth of 38% since the last Census (Census, 2020). La Via Campesina has a bolder perspective referring to the general participation stating that women produce 70% to 80% of the food consumed by the poorest families in the world, adding that it is difficult to credit women when ownership and leadership usually show that men are responsible. This points to the dimensional limitation in measuring women's participation in agricultural practices. A Brazilian study analyzing women's roles in agriculture indicated that women make up 37% to 51% of participants in family farming, especially in farming crops that are considered staples in the Brazilian diet (Lima and Jesus, 2016). Andrea Butto and Isolda Dantas (2011) stated that until the mid-1990s, in Brazil, "rural development policies did not recognize women's work and

characterized it as a mere aid to men,” which contributes to the validation of gender inequalities and women's dependence.

In the late 1990s, public policies emerged in Brazil to promote rural development focused on family farming and sustainability. These progressive policies partially rescue local and regional production and the revival of municipal markets (IBGE, 2009). Implementing these policies, especially during the 2000s, raised some awareness that although women have kept agroecological knowledge through history, their rural subordination and alienation from other farming roles created knowledge gaps and autonomy challenges that need to be addressed. Hence, during the late politically enabling environment in the 2000s, women's self-organization seeking to develop their agroecological production processes and commercialization became notorious, especially in the Brazilian Northeast. Lima and de Jesus (2016) emphasized that when women started venturing places beyond their acceptable family spaces in search of visibility and appreciation when they began articulating collective political organizations and social movements, they brought to these traditionally masculine spaces the logic of care to the interactions between the human and non-human affairs. Lima and de Jesus (2016) considered this logic of care extremely relevant to sustainable practices. In their concluding remarks, Lima and de Jesus (2016) questioned if agroecology would make possible without women and feminism.

The notion that women are innate caregivers has been used to argue that women are better at taking care of the environment, thus better keepers of sustainable food systems. That has not contributed much to women's rights in agriculture. Therefore, there is a need for reframing the logic of care to attribute its expected value to the context of agriculture. Pérez Marina asserts that “women are supposedly better caregivers than men, but this superiority in the androcentric framework is simply overlooked and confined to a devalued sphere” (Pérez Marina, 2009, p. 47). In accordance, Aguiar et al. (2009) concluded that agroecology could not fulfill its purpose of being a reference for equitable and sustainable rural development unless it brings, both in theory and practice, the recognition of women's contributions and the issues that make it difficult for them to participate as full subjects of rights. Thus, if women's leadership in agriculture is to flourish, there needs to be compensation for their expertise and leadership. The logic of care and its gender limitations can also be perceived in the SSE, which according to the IBGE (2009), is the main channel of commercialization for the family farming sector. The SSE offers “alternative economic strategies to reduce poverty and unemployment and to implement new civil-society-based economic revitalization strategies” (Mendell, 2009, p. 178). Gaiger (2004) attributes SSE as an ampler role and indicates one of the main objectives of the SSE is to provide an alternative practice in the workforce, breaking with the degrading working conditions and reconciling the worker with the process and fruits of their labour to overcome the disposable and alienating character of the productive activity. However, gender issues are also prevalent in SSE.

Results and Analysis – Farmers' Narratives Assessment

The IFAD's (Sriram, 2018) guide for designing gender agricultural policies states that the purpose of mapping social norms and gender issues is to understand how everyday life relations intersect with institutional support, that in turn can suggest how to improve both institutional and internal relations towards transformative actions to support equalitarian gender dynamics. In this portion, we considered all narratives, from the RXX members and farmers not organized in the

community, and funding agencies and community organizers were included. The selections represent a summary of the findings.

Understanding Gender and Social Norms

Table 1. translated from narratives.

<p>Selections translated from narratives Coded: Understanding gender and social norms and their institutional connections.</p>	<p>Analysing process How institutions contribute to shaping:</p>
<p>“After the Green revolution package, women were very much on the sidelines. I think these institutions, whether non-governmental or governmental, must have this sensitivity to perceive this diversity, this wisdom that exists in the field and then encourage the issue of the agroecological transition, to rescue this knowledge.”</p> <p>“The institutions have advanced a lot in recognizing that it was scientific knowledge with practical knowledge of farmers, it took a considerable leap, and this is undeniable, the MST booklets produced, the conservation units that were in the MST settlements.”</p>	<p>Knowledge gaps</p>
<p>“The programs for the insertion of women demystifying the myth that women did not know how to produce nor commercialize. These policies, the backyard gardens, which historically were the space where we worked, made us realize even more the women's potential. This made a considerable leap, but it is still necessary to move forward because there are still many issues that need to be discussed in-depth with women in the countryside, also to break some prejudices that are historically structured in patriarchy.”</p> <p>“In terms of agroecology, I think we made a lot of progress, considering that we had the national policy on agroecology, which was based on women's demands, I think that women played a fundamental role with the march of the Daisies, so it was an agenda that was also thought of by women, even though we did not sign the plan.”</p> <p>“All the public projects that I have followed and worked on in the last ten years require gender diversity, a percentage of women required for us to finance the project. Maybe it is not becoming clear to the communities, but this practice already exists. The experience we have with the new policies compared to before these requirements is that when the projects had only men, it was difficult to collaborate with them to divide the tasks because everyone wanted to be in charge. In many cases, after those factories were fully financed, not by loans, the money was given to them, they were closed by the health department, and they lost everything because they let it get very dirty. That does not happen when women are involved. What they (referring to the farmers) need is awareness of how cooperatives should be managed.”</p>	<p>Power and gender dynamics</p>
<p>“Their direction was vital to family farming. Before, there was no question of quotas, the son of a farm worker did not finish his studies, period. With the PT government, we saw it very easy, the gains both in terms of education and in terms of infrastructure for rural areas.”</p>	<p>Governmental direction Enabling environments</p>

Changing gender dynamics, the women’s narrative attributes the ability to organize themselves to the support provided by governmental institutions under the MDA. This refers to institutions, policies, and programs introduced during the late 1990s and 2000s that specifically target promoting women’s community organizations. The participants attributed the initial pull and early development to this enabling environment that pushed changes in gender dynamics and allowed them to flourish.

Findings highlight an observation from the narrative of funding agency representatives. The analyses are that the implementation of gender policies as described above lacks multidimensional reach, “when the projects had only men, it was difficult to collaborate with them to divide the tasks because everyone wanted to be in charge” (funding agency representative). These requirements for programs are to have a minimum percentage of women but do not appear to include equalitarian participation regarding women's roles. As the implementation agent stated, “many times these factories . . . they were closed by the health department, . . . because they would let it get very dirty. That doesn't happen when women are involved” (funding agency representative). The lack of multidimensional roles indicates undesired effects on reaffirming gender issues that limit women’s roles to caregivers and assert men as leaders. This is a rising concern broth by Alston (2014). Notwithstanding the rapid adoption of gender requirements globally, the processes and practices do not produce significant gender equality. Acosta et al. (2020) explain that the “starting point is the disjuncture between a firm establishment of the gender-mainstreaming discourse in policy and the limited visible effects in terms of reducing gender inequalities.”

We must challenge the dialogues that women are innate caregivers if that notion is also used to prevent women from other roles. Women have been expected to carry on caregiving roles, especially in rural communities. What is relevant is that the accumulated knowledge from conducting these expectations can and has been observed to contribute to creating and maintaining enabling environments for the emergency of sustainable and cooperative food systems. However, the knowledge women inherited from the historical dynamic of care necessary for sustainable food systems cannot subtract women from the role of leaders or decision-makers.

These narratives from RXX members and farmers organized in the community are from interviewees considered persons who play a central part in the project. The focus of the analyses are the main themes in gender dynamics appointed by the IFAD guide for designing gender policies for agricultural development that analyses five themes: access and control; planning and decision making; representation of equal voice; learning monitoring evaluation; and investing in program capacity (Sriram, 2018). The selections represent a summary of the findings.

Table 2. Selections translated from narratives.

Selections translated from narratives	Codes and analysis process
<p>“The education situation improved considerably here with the federal institutes built around here (referring to the late 1990s and 2000s federal institute rural expansion), but for the women, it did increase a bit, but where are the daycare centers for us to have the right to leave, to go outside the house?”</p> <p>“I usually say this, the solidarity economy by itself still doesn't solve the issue of us women. At RXX, in this solidarity economy, I can live in peace with myself, do my work as I can, whether it is in my role of a farmer, or be taking care of the children, my garden, taking care of my chicken, doing the work of care. It would be impossible if I worked in a formal job. I would have to pay for everything our group does for me today. It makes me feel happy. It's therapy, which I would have to pay for a therapist if I were in the formal market.”</p>	Representation of equal voice

<p>“Every dry season, we analyze things that worked and did not and make plans. In the plan, we also divided tasks. My wife keeps the planting part, as she cannot go out into the hot sun for too long . . .”</p> <p>“I’m a mother. Sometimes I listen to others seeking information to educate their children, so that they can get out of this life of slavery they live in [referring to farming]. It is not like this! I’m going to work to give my son an education that he can use, so he can come back, and we can progress in our land. Because young people are very smart about this new means of communication, publicize the product, even discuss the logo, and discuss packaging. I mean, we need our young too.”</p>	
<p>“I went to look for support during the drought, and they suggested ideas to diversify our activities... First to produce seedlings to sell. Then, we did an experiment with chicken. We took a poultry farming course. Not me it was her who did it (referring to his wife...) . . . We got 25 chicks from SENAR as an incentive, part of the training program. We raised them, and we saw that it worked.”</p> <p>“Because if we tell women that their productive sphere has to be below the reproductive sphere, and the responsibility is not shared. The reproductive sphere will hold us. The reproductive sphere must be at the center (of gender policies) because if you think that she is a person who works, you must provide conditions for her to work. After all, care work must be done. For example, the creation of collective laundry, popular restaurants, full-time daycare centers.”</p> <p>“In 2004, we understood that we needed not only a space to sell products, but also help those who were part of this space, the logistic. And later, we created our own here. We wanted a legal entity. That’s when we created the RXX, it turned into a network because each nucleus that we opened, we would give the nucleus both autonomy, representation, and access.”</p> <p>“In the RXX, there are many family units, each working in their land, but when they go to the municipal markets, marketing is collective, so there is individual space, and there is collective space that gets support on logistics.”</p> <p>“In 2004, we realized that we needed not only a space to sell products (participate in periodic markets), but also to help those who were part of this space, with the logistic. And later, we created our space here.”</p> <p>“We wanted a legal entity. That’s when we created the RXX. It turned into a network because each nucleus that we opened would give the nucleus autonomy, representation, and access.”</p> <p>“In the RXX, there are many family units, each working in their land, but when they go to the municipal markets, marketing is collective, so there is individual space, and there is collective space that gets support on logistics.”</p>	<p>Access and control</p> <p>Access to inputs in connection with applicable knowledge</p> <p>Market access</p>
<p>“I also think that this history of agroecology from the very conception of agroecology, of its science, of its dialogue, I think that the institutions have advanced in the recognition that it is scientific knowledge together with millennial practical knowledge of farmers that is the solution, and then there was a considerable leap, and that is undeniable, for instance, the booklets produced by the MST, the conservation units that were in the MST settlements.”</p>	<p>Institutional investment in program capacity.</p>

<p>“There's a great booklet that I was reading the other day. It's a production by ANA Agência Nacional de Águas (ANA), that is, the Brazilian scenario from the '90s until now was very fruitful in terms of the dissemination of agroecology.”</p>	
<p>“After yet another drought problem, we diversified our activities. So today we have diversified into apiculture, seedlings and sheep farming too . . . when there is enough water, we have more cultures.” [suggesting that, without diversification, it is hard to be resilience in their semi-arid region].</p> <p>“We live off selling seedlings, but every dry season we analyze things that worked and didn't and make plans. In the plan, we also divided tasks. My wife keeps the planting part, as she cannot go out into the hot sun for too long, so she stays in the shade of the Juazeiro. Then she plants, and we take care of it.”</p> <p>“It's hard to keep track of things. We know we need to document inputs, costs, and sales, but it's hard, and we don't have time. But then, the programs want to see all that to approve projects.”</p>	Learning/monitoring/evaluation
<p>“The history of collective work must be thought of in terms of the family unit, which is still a challenge.”</p> <p>“The topic that the Xique-Xique Network works on . . . from the family being able to choose, to consider young people and women. To recognize, because what is lacking in family farming . . . is to identify the labor that is in the house. If a man who commands, takes all the money, sells what he wants, whenever he wants, and does not involve the family, family farming will not go forward.”</p>	Planning and decision making

Equality of voice and female representation is still challenging even for the RXX members. The narrative showed this as a continuous construction. Regular workshops about gender dynamics facilitation are necessary and present in their praxis. Access to knowledge, information, and extension services has been a vital need, especially regarding integrating traditional women's accumulated expertise and modern technology.

The narrative referenced impacts of the MST approach to education within the rural community and focused on creating knowledge for and by peasants. In another instance, a participant described a program to build cisterns to capture rainwater. The project was based on a people's initiative, *Projeto Caixa D'agua*, and had communities build them out of masonry with the help of the recipient family. The success of this initiative can be attributed at least partly to its multidimensional reach. Access to inputs relates to applicable knowledge and support to guide practical application. The initiative also creates job opportunities and expands community and social expertise in implementing the solution. Unfortunately, after a few years of successful implementation, the government changed the project and now delivers large fiberglass containers instead. The installation is not readily available, and the water collected in the fiberglass container that sits above ground in semi-arid conditions evaporates quickly, rendering them useless.

Although it might be easier for governments to order them instead of managing the program as intended, the changes might aid the industry that manufactures the fiberglass containers more than it benefits the farmers. Thus, knowledge and capacity building should

involve having female farmers teach and shape innovative solutions, which can build resilience versus dependency on institutions and corporations.

Access to education is even more difficult for peasant women, who are still expected to be responsible for childcare and other unpaid and undervalued labour related to the logic of care. The problem with policies that nominate women's rights to occupy spaces previously mainly occupied by men is that the nomination alone does not drive internal changes in community gender dynamics. Men will not pick up their fair share of the unpaid work related to the logic of care just because programs aimed at giving access to women and girls to education or political spaces are now available. The existence alone of such programs offers women the chance to accumulate the equivalent of two full-time occupations, a paid and an unpaid one. In one sphere, women's rights have advanced because women are venturing into new spaces but primarily by accumulating a heavy burden that is sometimes not worth it or possible. Participant farmers believe public institutions should provide ways to share these costs "because if men, as individuals, will not share the burden, society must" (farmer).

Participants suggested that educational institutions and spaces for political participation in rural communities should provide free childcare (Farmer). In addition, communal laundries and public restaurants offering meals for free or at reduced prices are necessary to enable women's participation and reconcile the disproportional burden of the logic of care towards women. At RXX there are continuous workshops on women's rights and the value of labour related to the logic of care and their shared responsibility for them with the participants. These have shown to be effective in changing gender dynamics, at least among participants' family groups and their networks. Possibly because these workshops are tailored to respond to specific issues appointed by farm women, making the learning experience very relevant in producing real-life alternatives for the behaviour patterns that are being addressed. For instance, some participants mentioned that before their family unit became members of RXX, the husbands or sons were the only ones participating in educational and technical assistance courses, especially if these opportunities required travelling to the capital city. They sometimes invite mediators from outside the community, usually through their partnerships with higher education institutions, to lead the workshops making it easier to manage conflict and power dynamics. The farmers stated they have always worked on feminist education in their community, which was observed to have brought significant changes in gender dynamics. However, they also share it is still an ongoing challenge.

Policy Lessons and Farmer Inputs

Public policies to support family farmers can target several fronts. However, their multidimensional implementation is more likely to produce long-lasting changes, particularly regarding gender dynamics and social norms, partly because of their community ramifications. Below is a summary of suggestions for developing policies integrating sustainability aspects and gender dynamics based on farmers' praxis and narrative analysis inputs. The policy goals were adapted from *The Good Practice Checklist* (2016).

Table 3. Policy guide for integrating sustainability aspects, social norms, and gender dynamics.

Implementation approach	Sustainability aspect
-------------------------	-----------------------

Policy goals	Multidimensional reach		Soci al	Envir on.	Econ om.
Access to information and extension services	Promote community organization to allow efficient participation through representation.	Capacity-building for community leaders with organizational skills and resources.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Include sensitivity training so that they can address gender considerations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Include women and other vulnerable groups for leadership roles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ensure the information and institutional support are procured in the interest of all involved, considering the differentiated needs by gender and the interest of youth.	Promote the development of strategies or templates for inclusive participation in the definition of goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ensure the information and extension benefits are shared in the community	Provide support for the facilitation of periodic meetings or sharing spaces. Ex. Municipal street-markets	Support regular multistakeholder dialogue, to continuously inform on gender-transformative actions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Open public daycare centers or organize solidary childcare	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Policies to promote not just nominal access, but also promote shared control between women and men.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to inputs and technology	Egalitarian access to natural resources, inputs, and technology	Train funding agency and community development staff in gender dynamics issues to develop implementation approaches with the sensitivity to perceive issues.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Create program requirements that consider women's roles, not just the percentage of women enrolled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to and control of natural resources	Access to inputs in connection with accessible and applicable knowledge.	Use accessible language and engaging examples focused on real-world local family farming applicability.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Simultaneous implementation of technical knowledge and inputs incentives to start knowledge application.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Incorporate community agroecological knowledge with modern technology and capacity building for farmers, especially women, as educators.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Open public daycare centers or organize solidary childcare			
	Promote equal voices in representation and	Promote the development of tools and templates for inclusive planning and	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	decision making within households	decision-making process, offer training especially during the dry season.			
Equal representation		Develop strategies to establish that the family unit is the base for planning and the individual needs of all members should be addressed Promote women's leadership in communities			
Planning and decision making	Promote equal voices in representation and decision making in their community	Facilitate women's rights, gender dynamics workshops, and invite people outside the community to facilitate difficult multistakeholder discussions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Open public daycare centers or organize solidary childcare in spaces where women can actively participate.			
Monitoring evaluation and learning	Create programs that integrate learning and application of solutions	Promote community knowledge sharing, especially about solutions to regional issues.			
	Capacitate farmers on documenting inputs and information processes	Capacitate farmers as educators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Create smartphone applications involving youth to facilitate the process.			
Investing in program capacity	Conduct gender analysis	Conduct gender dynamics assessments with multidimensionality in mind	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Capacitate program agents	Train funding agency and community development staff in gender dynamics to develop their implementation approaches with the sensitivity to perceive issues.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Policy goals adapted from The Good Practice Checklist (2016).

From a social standpoint, small, unorganized farmers can become trapped in low-income cycles, with little chance of rising from farming. Multidimensional policies aimed at providing welfare, in some cases, cash transfer programs, implemented simultaneously or followed by programs that promote community organization, seem to have worked better to support the production of individual farmers without first addressing social needs when they are experiencing poverty. However, community organization does not happen without effort. Farmers experience difficulties with transportation and time constraints from the labour and coordination of farming, leaving little time or resources to allow a community organization or political representation. These constraints further isolate farmers and can trap them in poverty cycles. Thus, institutional promotion or facilitation of community organization to allow farmers spaces in spheres outside the farm through representation is paramount. This study finds that community organization and solidarity are differential elements in promoting resilience in difficult periods. Many respondents attributed these two elements as essential to understanding family welfare assurance. To expand the dimensionality of policies aimed at welfare assurance, variations to cash transfer programs

can be made to make women the beneficiary in the family unit, which might empower women and facilitate gender dynamic changes, such as including women in decision-making opportunities in their households. This also makes sense from a practical standpoint, as women are the main ones responsible for the care, such as procuring food and supplies.

Policies that promote environmental stewardship expressed in this work as agroecology facilitate the transition or maintenance of environmentally friendly food systems, where farmers would be rewarded with direct payments if they can demonstrate their agroecological practices. In addition, multidimensional policy implementation would incentivize for farmers to pursue courses or extension programs to improve themselves and achieve their agroecological goals. Other dimensions for agroecological knowledge extension programs include promoting women as educators, providing women with recognition and compensation, and tying the financial gains to sustainability.

To return to the social expression of sustainable food systems expressed here as womanism, the inclusion of women in these spaces can only be achieved if the coordination of caring activities is considered. To overcome the disproportional burden laid on women as caregivers, governmental institutions should foot the bill and have communities share the costs of care, provide rural communities with accessible, full-day childcare, and aspire to give women more equitable working conditions, such as communal laundries and public restaurants. These solutions can further the circular community dimensionality of policy implementation, as public restaurants and daycare centers also can benefit. The circular community dimensionality can procure healthy and agroecological food products from family farmers in the same region.

Conclusions

The narrative analyses of the praxis of the women farmers that participated in this study propose guiding suggestions for the integration of the elements of sustainability, such as environmental protection, social equity, and economic benefit, expressed as agroecology, womanism, and SSE building on existing programs to suggest improvements as well as to challenge the androcentric and anthropocentric issues found in this assessment.

In agreement with Pacheco (2002), this study's findings explain how the economic property was denied to women by the disjointing view of the sustainability aspects shown in their experience regarding implementation of policies, and their daily praxis, where care duty, be it childcare or agricultural work, is positively connected to agroecology, or the environmental aspect of sustainability. Still, the labour and costs involved in the logic of care are not equally shared with male counterparts. In addition, caregiving is also not perceived as work. Therefore, women are deprived of monetary compensation and the autonomy of choice.

In Brazil, agronomy is a traditional subject in higher education, accepted and validated as agricultural knowledge. Agroecology, on the other hand, was excluded from the agronomy federal university programs during the Green Revolution as per USAID conditions. Thus, agroecology is not a new subject. In this context, it is sustainable agronomy and an approach to agricultural science adopted by farmers because agronomy has neither represented nor properly fulfilled family farmers' demands. In this context, observed agroecology aims to democratize

access to knowledge, infrastructure, inputs, such as seeds and organic fertilizers and pest controls, and coordination technologies for marketing production.

The educational or knowledge-sharing approach is rooted in popular education and has specific goals that are not necessarily the same as formal education. Tarlau (2015) explained the pedagogical innovations coming from the MST schools, where communities draw on diverse educational theories that echo local practices and principles to create alternative proposals for their educational needs and world views. Most members of the RXX have current or at least past involvement with the MST. Some RXX members suggested their approaches to education, and their visions for societal transformation demands are a reflex from their experience as members of the MST social movement. According to Tarlau (2015), the MST's educational initiatives are a reference in terms of methodology in the debate about how grassroots movements develop alternatives to dominant educational. The MST's approaches involve multidimensional practices; they also integrate the elements of sustainability to implement their vision of environmental, economic, and social goals. The MST integration also aims at promoting ground-up policymaking through education, political representation and activism. Although their education is a reference to promoting change in the dynamics regarding socio-economic and environmental issues, members of the RXX revealed that the MST still has much work to do regarding gender equality. Therefore, RXX's education curriculum brings feminism, practiced as womanism, into the fold. The integration of gender dynamics is a key element to achieving the transformation of agriculture towards sustainability.

The named feminist social aspect of sustainability expressed in the RXX member's narratives, as in womanism explained by Pérez (2009), must be integrated with the economic aspect to enable women to occupy leadership and management roles. Another gap that needs to be narrowed is the recognition and compensation of farming women as educators and specialists in their fields. Conclusions from Perez (2009) and Aguiar et al. (2009) corroborate with the findings on the importance of asserting women's authority as specialists in agroecology by recognizing and compensating their roles in disseminating knowledge that helps build food systems for equitable and sustainable rural development. One way to incorporate multidimensional policies or programs is to engage and employ more female farmers as educators in existing technical assistance programs in their communities, promoting recognition, validation, and compensation.

Challenging gender dynamics and enabling its transformation must include compensation for women's participation in family farming as educators, administrators, and producers. This can play a significant role in enabling sustainability in local food systems. Women's praxis shown in this study act as the bond that integrates the otherwise disjointed sustainability aspects, creating strategies that enable the codependent interaction between the economic, social, and environmental spheres.

8. MODELING SUSTAINABLE FOOD SYSTEMS FROM THE INTEGRATED PRAXIS OF WOMANISM, AGROECOLOGY, AND SOLIDARITY

This chapter summarizes the emerging practices observed in this study as a model, from the range of manuscripts presented in this thesis that focuses on narratives analysis and farmers' perspectives. It considers the changes in recent decades and affected local food systems, such as, the external drivers such as governmental directions, environmental challenges, and institutional relations. The model also presents internal or community drivers: womanism, agroecology and SSE, as they are experienced by the participants, as well as how these drivers interact with social norms and gender dynamics in the praxis of family farmers and other stakeholders, distilling current thinking from narrative assessment and exploring critical agricultural and rural development policy issues situated within this context.

RXX aims to enable agroecological production and connect family producers directly to the consumers. It also supports members in terms of political representation, the promotion of partnerships, and the establishment of their agency as educators in dissemination social knowledge relevant to their community development. The term, "*tecnologia social*," [social knowledge] means knowledge that is produced by or in cooperation (partnerships) with farmers to solve practical issues or to further development. It can be innovative or based in traditional knowledge, it is adaptable, accessible, and should be widely distributed in solidarity, usually by involving the community members as educators. This concept was explained by farmers that participated in this study. The network consists of several groups, such as family units, informal groups, and formal associations. In 2003, they formed a cooperative, Cooperxique, to serve as a standard formal commercial outlet for the network. The commercialization paths for the Xique-Xique Network members include participation in municipal street markets and procuring for governmental institutions through their outreach and project development approaches that allow them to participate in public bids and supply their permanent stores. In 2021, they achieved a great goal to move from a small, rented house that barely accommodated their commercialization and community organization needs to a new space owned by the cooperative. This was a long-awaited realization. The cooperative built an ample area to house their multidimensional praxis, a place to integrate their sale, administration, and some of their social and educational needs.



Figure 14. Photo of the RXX store/market from their Facebook page.

The participation in the RXX encouraged a boost in production and income generation for families, ensuring market outlets and transportation, which represent a prohibitive cost for many individual family farming units and are paramount in granting family farmers direct market access to consumers.

The chart below was created from RXX documents and narrative inquiry. It represents their organizational model. The RXX is currently composed of 19 nuclei, where the nucleus acts as a local representative cell for each microregion spread throughout the State's territory. The management council is formed with representatives from each nucleus. Then, the organization forks into two legal fronts: an association and a cooperative.

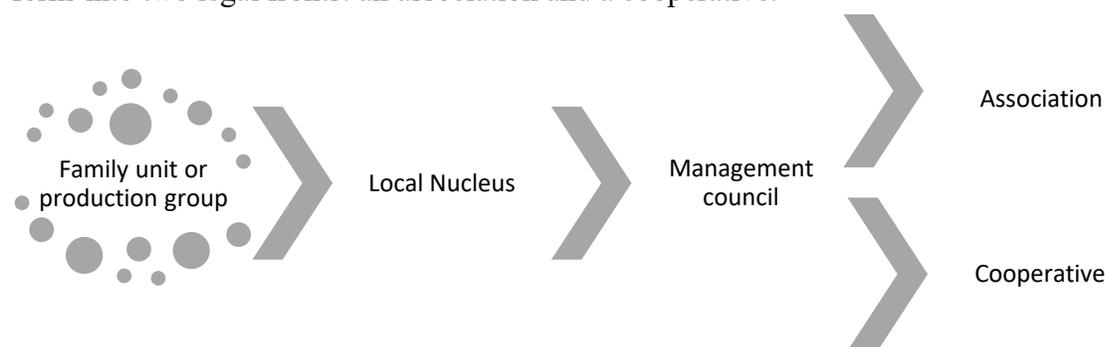


Figure 15. RXX Organizational Model.

Created from RXX documents and narrative enquiry.

While a management council periodic monthly meeting is regularly scheduled, the local meetings do not appear to happen very consistently due to the logistic limitations of some

members and the center's organizational priorities and capacities. The nucleus is a local cell. It allows representations to family units, sometimes located in remote areas, where there are limited infrastructures, which otherwise would be unable to extend their representation or market expansion. The management council comprises representatives from the local nucleus and forms an exchange network that can reach all levels. They have monthly meetings, which lately are happening less often since it requires lodging and transportation for members' participation, and funds for supporting community organizations from external institutions have decreased or been discontinued. There are also annual events that seem consistent and relevant to the organization. Preceding the annual meeting, microregional meetings are organized to bring up-to-date concerns from microregions to the central administration of the RXX. The issues and previous objectives are evaluated, directions and planning are defined, and actions and strategies are deliberated democratically. Childcare and other accommodations, such as transportation and solitary lodging, are provided during these events as needed. Food is also provided. In workshops and knowledge-sharing events, women from the RXX and invited speakers seem to lead workshops.

As the RXX grows and reaches different microregions in the State, the network cluster organization approach preserves the autonomy and representation of family units and small production groups, which is innovative. Scaling up and keeping representation is a known challenge in SSE initiatives. Representation is especially important in the State since the RN has distinct biomes mainly: Mangrove, Atlantic Forest, and Caatinga (semi-arid conditions). Representation at the microregional level is always crucial for socioeconomic reasons but even more in this case because their needs can be environmentally different. While the mangrove areas might experience floods, the caatinga regions can experience droughts. This model looks to preserve their community representation. The family farming units also can preserve their traditional accumulated knowledge if they abide by the RXX network's agroecological and socioeconomic principles.

Their production was perceived to be organic, although, at the time, they were still working on getting the organic certification for some of their production units. Furthermore, each production unit must have an inspection before the certificate is granted. There are additional wait times, and the cost of the certification process and political obstacles are challenging.

The farmers stated that being part of the network had enabled them to sell their produce directly to customers in the Xique-Xique farmers' market. The RXX is divided into two entities, the Xique-Xique Association and the Cooperxique. The cooperative gives farmers different legal statuses focused on commercialization, while the association focuses on community organization, mobilization, and partnership outreach.

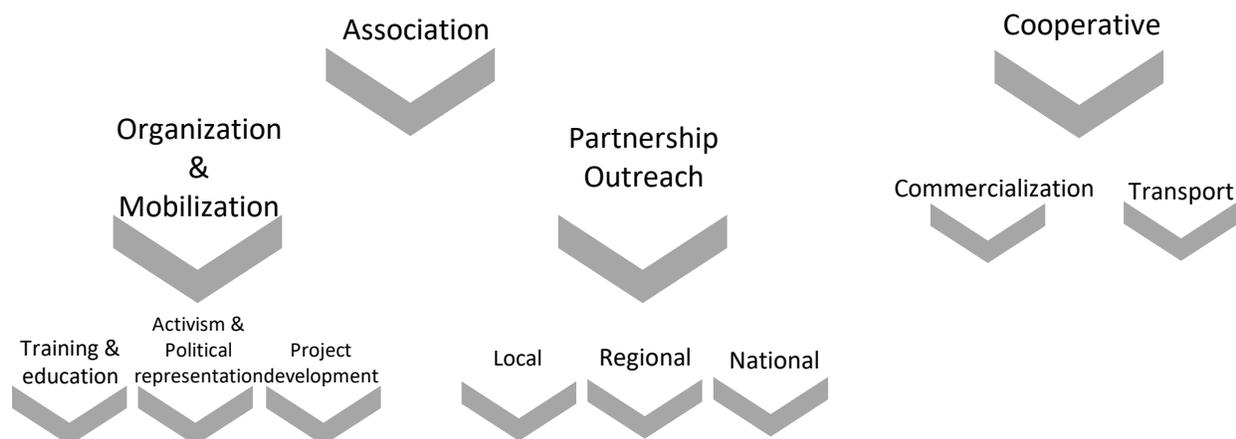


Figure 16. Detailed Organizational Model.

Adapted from RXX documents and narrative enquiry.

Due to monetary restraints, only a couple of positions are full-time hires. They share most of the work involved with the organizational operations. These paid positions sometimes are partially funded by governmental programs when available. They also have temporary workers, consultants, and both voluntary and paid interns operating the multidimensional functions. For instance, their partnership with the State University of RN (UERJ) provides interns from time to time in different areas. Interns may work on their financial accounting or teach them how to use software and electronic platforms to develop measuring frameworks for production and aid in writing projects and grant applications. The partnerships also contributed to organizing revenue and documentation for tax purposes. Another educational partnership program sometimes offers legal consultation with law students that help them develop capabilities in obtaining contracts with government institutions, expanding and integrating their markets with local and neighbouring communities, and adding to their collective knowledge. The management participates in local committees and other spaces of political representation.

Integrated Sustainability Aspects

From the RXX praxis, we can perceive how the principles are integrated through womanism and the of the logic of care to realize sustainability. Table 4 shows the intersection between the RXX's three principles: agroecology, SSE, and womanism and how their praxis interacts to attain the observed sustainability properties.

Table 4. Praxis integrates sustainability aspects through womanism and the logic of care.

Integrating sustainable aspects through Praxis	Gender dynamics and the logic of care
<p>The family units have local representation at their community nucleus and regional meetings. The association management provides sociopolitical representation and institutional outreach and support.</p>	<p>Childcare allows women's socio-political representation, participation in meetings and continuous education. Women that occupy leadership roles usually are more likely to prioritize, recognize and remunerate services related to care such as catering for events and childcare.</p>
<p>The family units can preserve their generational and geographic knowledge in their farming practices if agroecological. RXX requires production without toxic chemical inputs and GMO seeds.</p>	
<p>Women occupy leadership and management roles. Continuous efforts to challenge sexist practices. Inviting outside facilitators for workshops to help break abusive behaviour patterns. (partnerships)</p>	
<p>Biodiversity practices include individual and collective exploration for more resilient varieties of plants. Development and co-development of education initiatives of social knowledge. (partnerships) The cooperation continually appraises farmers' demands, addresses a crucial vulnerability, and expands resilience standing.</p>	
<p>Agroecological approaches per production, including pest control and knowledge sharing at the community nucleon and regional levels. Procurement of innovative solutions through partnership with educational and developments institutions.</p>	
<p>RXX acts towards local and regional development and outreach to the national sphere on activism and political representation. Promotes biodiversity in their production. Agroecology is a requirement. Actively encourages gender equity in participative ways.</p>	

The gender dynamics towards transformation at the RXX were not merely a nominal condition or a numerical percentage requirement. It is actively promoted in multidimensional ways. Women are in positions of leadership. They prioritize childcare and acknowledge women's services related to care. RXX periodically assesses demands, including gender educational needs and gaps, and responds to local demands from the nucleus, resulting in continuous progress toward gender equity in their praxis. It is worth noting though the RXX praxis is not without gender dynamics issues. Actions to challenge them seem to be constant. They still have a long way to go with gender equity in their community praxis.

The food system is "a network of multiple variables that are interconnected through causal relationships" (Allen & Prospero, 2016, p. 958). The RXX is a network for SSE founded in the semi-arid region of the Brazilian Northeast. The network was started in 1999 by a group of women from the MST land settlement, Mulungunzinho, in Mossoro, RN. External drivers encouraged their initial community organization as governmental institutions started programs to support women's community organizations in rural areas. Because agriculture was part of their daily lives and traditions, they opted for an initiative for the production and market of agro-ecologically produced food. The group was composed exclusively of women, and, eventually, the women's group grew and gained the attention of men. "When the money started to come, they

wanted to take over” (farmer). The network is now open to all, although most members and the management are women.

The broader context constructs the collections of external drivers that influence the performance and development as limitations or promoters. (Allen & Prospero, 2016). These drivers help to shape the local food systems in the northeast of Brazil, as identified in part of this study. The external drivers work as powerful levers, shown to have enormous potential to push family farming forward or to hold back its development. In the late 1990s and 2000s political directions guided a decade of fast development for the family farming sector in Brazil.

On the other hand, recent changes in political direction triggered changes to a new set of drivers limiting the sectors’ development. Farmers have perceived significant setbacks in the industry. Allen and Prospero (2016) explain that food systems are highly complex and driven by many economic, sociocultural, and environmental aspects, ranging from local to global. They also have internal and external pulling to their boundaries. The adverse external drivers, according to the farmers’ perspectives, were the consumer’s perceived image of food systems; the consumer's preferences for the convenience of ultra-processed foods in industrial packaging; insufficient institutional and governmental support; inconsistent and unidimensional implementation of programs; demanding access of technological developments; unfair market conditions; natural environmental factors, such as droughts, soil degradation, and climate change; and lack of basic infrastructures, such as limited access to water; and uncertainty of public support due to discontinuity caused by political changes.

In Ericksen’s (2007) model, the drivers are divided into geographic, natural, and socioeconomic categories. These drivers separately interact with the food systems activities, described as production, processing and packaging, distribution and retail and consumption, which results in the food systems outcomes. These form a response through two types of loops to the drivers’ geographic and socioeconomic feedback. Allen and Prospero (2016), building on Turner et al. (2003), Ericksen (2007) and Ingram (2011)’s models, added an analysis assessment using the concepts of vulnerability and resilience. They concluded that the identification of “a systems sensitivity to change, in addition to the capacity of the system to cope, adapt, and transform to these changes, is considered key to understanding dynamic systems” (Allen & Prospero, 2016, p. 968).

Local food systems are part of the global food systems exposed to external drivers that shape this system. The result of interactions between external and internal drivers will result from how local food systems manage the effects of external drivers or sudden changes. For local food systems, the outcomes of such interactions with adverse drivers can range widely and result in the timely development of adaptive solutions to continue thriving. Still, it can also result in a sharp decline in farmers’ welfare.

Food System Model based on Womanism, Agroecology, and Solidarity

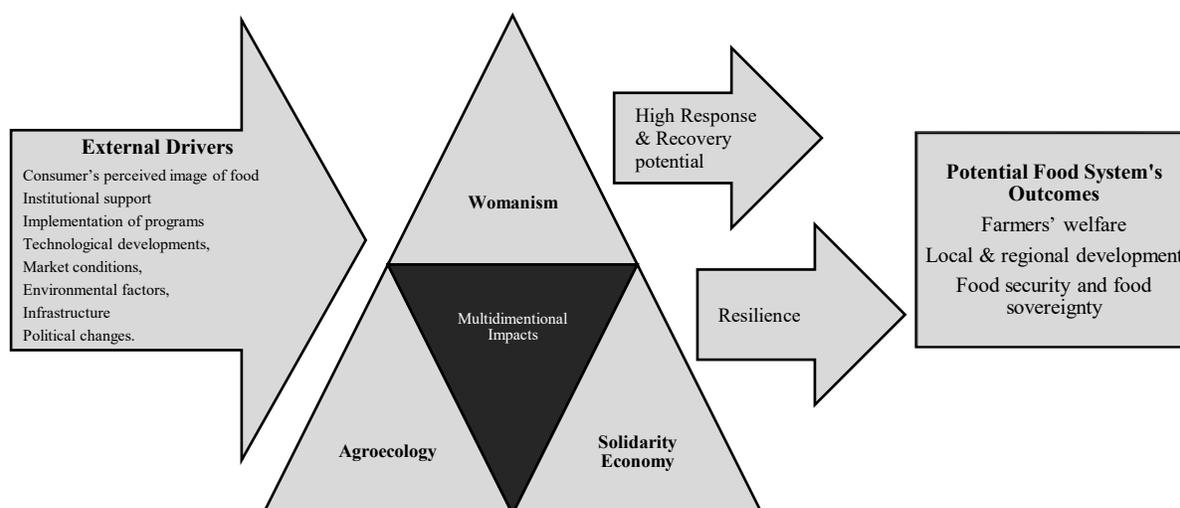


Figure 17. Food System Model based on Womanism, Agroecology, and Solidarity.

Created from RXX narrative enquiry.

External Drivers

The first external driver, as shown in the model, to affect this regional food system is the consumer's perceived image of food or the conceptualization of food by the public and their respective systems. It regards how consumers orient their food choices towards grocery choices and food policies. The perceived image relates to the food systems concepts that dominate mainstream channels, where agribusiness is prominent and economically important. It also refers to participant farmers' claims that consumers prefer ultra-processed foods in industrial packaging for their convenience compared to fresh vegetables.

The institutional support driver conveyed concerns about the implementing policies that support family farming as the programs observed are significantly affected by inconsistency (varies with government ideology) and unidimensional implementation. Solutions for this issue are presented in Chapter Five. Farmer participants stated insufficient or inadequate institutional and governmental support even when political will is present.

The technical support driver is shown as key to rural communities. Farmers pointed out the difficulty of accessing technological developments because language and methodology can be unapproachable, or their unidimensional implementation is not sensitive enough to perceive coordination limitations or to accommodate needs based on gender dynamic issues, thus, hindering the impact of such policies.

Furthermore, unfair market condition is a common issue in family farming worldwide. Natural environmental factors, such as droughts, soil degradation, climate change, and desertification, are other external drivers that further constrain farming in the region. These factors are exacerbated by the historic seclusion of the development of basic infrastructure in the

region. The lack of basic infrastructure has multidimensional effects and is still a reality for many rural families in the region. Finally, the farmers described changes in political direction at all levels of administration cause a perpetual condition of uncertainty where the discontinuity of support is common.

Internal Drivers

The internal drivers of change scrutinized in this study are based on narrative assessment and observations of relations within their praxis and include womanism, agroecology and SSE organizational principles. Along with these purposeful internal drivers, other drivers are involved in the relations and processes ranging from the ones that happen within the family unit; to their community interactions related to the exchanges and relations between farmers, their community organizations, and organization relations to respond to external drivers' crisis.

The set of internal drivers will determine how food systems fair when exposed to external influences or changes; it will determine their ability to work with external demands they cannot determine; it will determine how vulnerable or resilient they are to economic stress; if they have or can develop strategies to assess the impact of political or economic changes, and plan actions to continue to thrive; or to work on vulnerabilities and develop strategies for recovery and protection of their wellbeing.

This model is an integrated view of sustainability aspects with local social norms and gender dynamics, which has been shown to present significant resilient potential. The RXX resilience and response capacity are currently being tested as Brazil has been experiencing a prolonged economic crisis over the last eight years, exacerbated by the COVID-19 pandemic. During this time, the RXX has developed adapting strategies to change external funding sourcing from mainly federal programs to diverse funding options from private, state and municipal institutions; and continues to thrive. Amid the Pandemic crisis, the RXX has opened a new farmers market/store in Mossoro, RN. This study found that women's leadership, community organization and solidarity are vital elements in promoting resilience in difficult periods and protecting rural communities' welfare.

CONCLUSION AND RESEARCH LIMITATIONS

This thesis aims to understand how family farming households produce food, generate income, and manage farmsteads and other related spaces to pursue sustainable community development. It explores present debates and critical issues that are still current in agricultural and rural development, serving as a systematic foundation for the model constructed using the results from the manuscript collection that composes this research.

This thesis was presented in a manuscript format. Therefore, each manuscript was a step toward reaching the main objective. For publication, each manuscript had its own questions, methods, and conclusion. This brief summary explains, using mixed methods and participatory approaches, the path taken in this exploration to understand how family farming households produce food, generate income, and manage farmsteads and other related spaces to pursue sustainable community development. In the Mapping, the farmers brought the issues and strengths within their experiences and contributed to developing research questions. From the mapping, two main directions surfaced: the role of institutions and the conceptualization of food. These themes guided the next two chapters. Exploring the role of institutions as institutions influences local to international spheres in agriculture. The results showed that institutions can support or obstruct family farming and SSE development. The “Google it” chapter further investigated the conceptualization of food systems and how it affects both individual and collective food choices. Getting on Gender Studies was a data-driven choice to answer a question about why gender-equality policies have had limited results and how the RXX initiative navigated to reduce the effects of these deficient policies. Revisiting the data revealed that gender dynamics within participants’ practices operated as a facilitator. It was possible to infer that much of their resilience, adaptability, and capacity to take advantage of public policies were facilitated by their ability to successfully rearrange their gender dynamics in solidarity to enable resilience and sustainability.

The food systems can probably encompass most of the seventeen SDGs, however, their target actions are not always connected in a way as to enable each other. For instance, the SDGs separately identify goals, targets, and indicators to guide actions to address poverty, hunger, gender equality, water access, and climate issues, among others. Goal number one, to end poverty target actions focusing on resource redistribution, mentions gender-related strategies as one of their seven targets, but it is unrelated to food. Poverty is a major cause of hunger, which does connect with food in the form of access and distribution. However, the strategies do not include developing food systems to promote community resilience through food production; Goal number two, to end hunger, the SDGs do include gender strategies to increase food access to women and girls but not so much on policies to promote women's leadership in agriculture. Hunger-related strategies mention adaptation to climate change and the goal to increase sustainable farming production in two different targets that nominate the need for equal numbers in policies for the distribution of recourses such as land but do not address gender enabling strategies to warranty women’s proper participation in such programs; Goal number five, gender equality focuses on laws to protect women’s rights and the equal distribution of recourses. It also states the promotion of an equal proportion of time spent on unpaid care work. This is an important element; however, it has not achieved the expected results. The suffrage movement also promoted an equal share of care work in 1920, but men have yet to pick up their share. This target serves to nominate women’s rights, not to enable them, especially in rural areas where

public services and infrastructure to absorb a share of care work are still largely unavailable. Number six, adequate water to all, aims to ensure the access and sustainable management of water and sanitation for all. It does not mention, in its target nor indicators, water for farming use, the disproportionate women's role in water procurement in rural areas or climate adaptation strategies; Goal thirteen, climate change adaptation, focuses on capacity-building planning and managing climate change. It also emphasizes monitoring results and efforts from UN members. In its strategy, its targets and indicators do not mention food systems impacts, or how to enable women's participation in their capacity-building programs (UN, General Assembly, 2015; UN, The 17 SDGs). Therefore, SDGs' strategies concentrate on redistributing resources, which is extremely important in mitigating continuous and growing emergencies and crisis responses. However, the distribution of resources alone does not offer a proper path to independence from social assistance. It also promotes the dumping of industrialized food surplus and agribusiness inputs to underdeveloped and developing countries through international aid. The lack of integration and connection between the strategies also proliferates the nominations of rights without necessarily enabling them.

This research revealed from the local practice that many SDGs issues not only are connected but may not be solved if tackled separately. The model presented in this study sheds light on how these actions can be tackled in more integrated ways. The documentation of farmers' voices and the narrative analyses and interdisciplinary approaches shown in this collection of manuscripts offer a perspective in a way that is not often the focus of academia. The role of women in developing the food systems shown in this case study is to serve as an agent for the interconnection of the sustainability elements in such a way as to allow their realization. The social aspect in their womanist approach allows women access to the economic aspect of sustainability, thought SSE, which in turn is codependent on the environmental aspect expressed as agroecology. In this case, when women in leadership are supported to occupy different spaces and navigate the food systems enabling settings, there is a prioritization of the logistic of care which is a condition to their participation and a contrasting feature of the RXX initiative in the region. Thus, for women to access places of political representation, learning spaces, or leadership positions, addressing the logistics involved in the unpaid work of caring is required. However, as stated in this study, the existing supporting institutions and policymakers still focus on the nomination of women's rights in their programs, which has shown to be insufficient in realizing such rights. Therefore, agricultural support for gender equality needs to be multi-dimensional and participatory, that is, involve women from the location in the definition of policy objectives, must prioritize the provision of the logic of care concerning the enabling of the target actions, improve the implementation process to coordinate the offering of public services that absorb a share of caring work and include sensibilization training for their implementation agents in a way that policy implantation agents recognize the difference between nominating the right to participate and enabling participation.

The proposed model for sustainable food systems used the mapping in Chapter four to identify the external drivers affecting the food systems in the region. The main findings in this chapter indicated that family farming faced an unfavourable situation in marketing their products, partially caused by insufficient support from the public institutions and by the conditions imposed by agribusiness's prejudicial influences. It also saw that the farmers suffered from a lack of basic infrastructure, discouraging regulations, and difficulty accessing modern technologies. Issues concerning the distribution of farm produce were found to be prevalent obstacles.

The results from Chapters five and six added details to describe the macro relations at play and the multidimensional way these external drivers affect the food system in this context. The key results in Chapter five offered a unique perspective from the actors involved in family agriculture and solidarity economy in the State of RN, including concerning the effects of the late change in government within this research project's scope. The research showed that reducing institutional support for family farmers can have devastating consequences on farmers' working and living conditions. However, the results also demonstrated the resilience of community organizations and networks in family farming and SSE.

Chapter six concentrated on understanding how food is conceptualized and how the image of the concepts of food systems are portrayed in mainstream media frameworks, elucidating on how these images can suggest meaning to influence food choices. Food conceptualization differs from one person to another, but specific ideas about food or diet trends are common. Food in the same cultural or social background can be similar. For instance, what is perceived as Mexican food, or the Keto diet are recognized concepts, with correspondingly recognizable images in databases, such as Google Images. These images can oversimplify or misrepresent their corresponding concepts. The food systems' perceived image as portrayed in mainstream media revealed a discrepancy between what was pictured in Google Images and their respective recognized concepts. There is an idealized notion of agribusiness as a thriving food system in large, neat farms full of machines. At the same time, the oversimplified view of family farming diminishes their role in agriculture and reduces the perceived economic impacts of its outcome. It also suggests that their lack of technology use is an idealized choice. The analysis showed that institutions shaped food systems by promoting or obstructing their development and also influenced the images portrayed.

The pillars for the model proposed here were drawn from principles identified and described in Chapter seven from the narrative analysis and the reflection of the farmers' perspectives as they connect with their social norms and gender dynamics. The findings show how social norms permeate sustainability practices. The narrative analysis revealed the RXX praxis actively promoted positive gender dynamics in multidimensional ways. Women were in positions of leadership and prioritized childcare. They were acknowledged and valorized. They periodically assess demands, including gender education needs and gaps, and respond to local demands from the nucleus, resulting in continuous progress.

The proposed model is based on an integrated view of sustainability with local social norms and gender dynamics, which has been shown to present significant resilient potential. The model's RXX resilience and response capacity were evaluated as Brazil went through an economic crisis over the past six years, which was exacerbated by the COVID-19 pandemic. During this time, the RXX has developed strategies to adapt and thrive. This study found that community organization and solidarity are vital elements in promoting resilience under challenging periods, especially for welfare assurance.

Finally, the model represents a significant contribution as it presents unique drivers. It also presents distinctive ways to express the usually disjoining aspects of sustainability described in an integrated manner. This integration seems to promote a synergy resulting in the multidimensional address of issues to improve food systems outcomes promoting resilience and

the emergence of response strategies. This research aims to fill the gap in the literature by focusing on small farming practices, co-operative and SSE, and women's role in sustainable development, with a special focus on experiences from Northeast Brazil, which is also underrepresented in the literature.

One limitation of this study was the scope restriction to the Northeast of Brazil, precisely the Rio Grande do Norte State. This research might not produce a generalized model for food systems. Thus, the replicability and relevance of this model might be reserved for this region. However, as an underrepresented region, the participative co-construction process presented here might help adapt this model to other initiatives or to surrounding regions.

Changes in the Brazilian political environment caused other limitations or challenges regarding funding for research institutions that support family farming in the region. The researcher had previously secured a partnership with a local institution, allowing for more participative research and implementation of transformative strategies. However, before the fieldwork began, this partner institution suffered cuts in its federal funding support and could no longer assist. Thus, the research was reshaped to exclude this portion.

The ethical considerations in this research had its proposal assessed and approved by the Concordia University Human Research Ethics members and received the Certificate of Ethical Acceptability 30008198. This research is not necessarily intended to benefit any participant personally. However, the methodology used (PAR) is meant to bring beneficial changes to the community through collaborative problem-solving.

Participation in this research was confidential. No one will have access to the data about the identity except the people directly involved in writing the research. The information will only be used for research. The participants will not be identified in the published results, and their participation can be withdrawn before publication. The conditions of participation in the research are stated in the Information and Consent Form and the Summary Protocol form. A copy of these documents can be found in the Appendices. A copy of the questionnaires to conduct the semi-structured interviews in the preliminary study can also be found in the appendices.

Women's multidimensional involvement is fundamental to developing more sustainable food systems. As described by participants in this research, the policies introduced in the 1990s and early 2000s to support family farmers and women farmers had a positive impact on inspiring women to venture outside their homes. The policies included rural education on women's rights and community organization. It also stipulated requirements that a certain number of members must be women. However, one of the reasons why gender policies that have been in place for the past three decades have not produced significant results to narrow the gender inequality gap in agriculture is that the gender policies have been insufficient and unidimensional. Thus, policies need to evolve from nominating women's rights to facilitating its manifestation in practice. Although this study presented several suggestions on how to create better policies and integrate programs, further research is necessary to better understand and create detailed guides for such policies.

REFERENCES

- Acosta, M., van Wessel, M., van Bommel, S., Ampaire, E. L., Jassogne, L., & Feindt, P. H. (2020). The power of narratives: Explaining inaction on gender mainstreaming in Uganda's climate change policy. *Development Policy Review*, 38(5), 555–574. <https://doi.org/10.1111/dpr.12458>
- Agência Brasil. [Brazil communication company] (2018). *Bolsonaro diz que não fará acordos que prejudiquem agronegócio*. [Bolsonaro says he will not make deals that harm agribusiness]. <http://agenciabrasil.ebc.com.br/politica/noticia/2018-11/bolsonaro-nao-fara-acordos-que-prejudiquem-agronegocio-do-brasil>
- Agencia Brasil [Brazil communication company] (2003). *Conheça as ações previstas no Programa Fome Zero* [Discover the actions offered by the Zero Hunger Program]. <http://memoria.ebc.com.br/agenciabrasil/noticia/2003-05-02/conheca-aco-es-previstas-no-programa-fome-zero>
- Aguiar, M. V., Siliprandi, E., & Pacheco, M. E. (2009). Mulheres no congresso brasileiro de agroecologia. *Mulheres construindo*, [Women at the Brazilian congress. Women building] 6(4), 46-52. <http://www.bibliotecadigital.abong.org.br/bitstream/handle/11465/589/240.pdf?sequence=1#page=46>
- Ahlers, R., Zwartveen, M. (2009). The Water Question in Feminism: Water Control and Gender Inequities in A Neoliberal Era. *Gender, Place and Culture* 16(4), p. 409-426.
- Aktaş-Polat, S., & Polat, S. (2020). A theoretical analysis of food meaning in anthropology and sociology. *Tourism: An International Interdisciplinary Journal*, 68(3), 278–293. <https://doi.org/10.37741/t.68.3.3>
- James, E. A., & Epp, D. B. M. (2007). The third-year outcomes of participatory action research facilitated online. *Institute of Education, University of London*, 5, 8.
- Allen, M. (Ed.). (2017). *The SAGE encyclopedia of communication research methods*. SAGE publications. <https://dx.doi.org/10.4135/9781483381411>
- Allen, T., & Prosperi, P. (2016). Modelling sustainable food systems. *Environmental Management*, 57(5), 956-975. <https://doi.org/10.1007/s00267-016-0664-8>
- Alkon, A. H., & Agyeman, J. (Eds.). (2011). *Cultivating food justice: Race, class, and sustainability*. MIT press.
- Alvalá, R., Cunha, A. P., Brito, S. S., Seluchi, M. E., Marengo, J. A., Moraes, O. L., & Carvalho, M. A. (2017). Drought monitoring in the Brazilian Semiarid region. *Anais da Academia Brasileira de Ciências*, 91. <https://doi.org/10.1590/0001-3765201720170209>
- Alston, M. (2014). Gender mainstreaming and climate change. *Women's Studies International Forum*, 47, 287–294. <https://doi.org/10.1016/j.wsif.2013.01.016>
- Balza, G. (2009). Reforma agrária regrediu no governo lula, diz Stedile. [Agrarian reform regressed under Lula, says Stedile] UOL News. <https://noticias.uol.com.br>
- Barry, F. B., & Grady, S. C. (2019). Africana womanism as an extension of feminism in political ecology (of health) research. *Geoforum*, 103, 182–186. <https://doi.org/10.1016/j.geoforum.2018.09.024>
- Berdegú, J. A., & Fuentealba, R. (2014). The state of smallholders in agriculture in Latin America. *New directions for smallholder agriculture*, 115–152.
- Béné, C., Prager, S. D., Achicanoy, H. A., Toro, P. A., Lamotte, L., Bonilla, C., & Mapes, B. R. (2019). Global map and indicators of food system sustainability. *Scientific data*, 6(1), 115. <https://doi.org/10.1038/s41597-019-0301-5>

- Boni, Z. (2019). The sociology of food is not about eating, it is about doing a lot of very hard thinking: An interview with Professor Anne Murcott. *Current Sociology*.
<https://doi.org/10.1177/0011392119850100>.
- Brandão, C. R. (2015). Paulo Freire: A educação, a cultura e a universidade: memória de uma história há cinquenta anos atrás. *Revista Festim*, Natal, v. 1, n. 2, p. 157-172.
- Brazil Gov. Instituto Brasileiro de Geografia e Estatística (IBGE). (2009). Censo agropecuário 2006. [Agricultural Census]. Brazil: Gov.
- Buriti, C. O. Barbosa, H. A. (2019). Drought and socio-environmental vulnerability in the Brazilian semi-arid: the institutionalization of scientific studies and water policies in the region. *Ciência Geográfica Ano XXIII - Vol. XXIII - (1)*. Bauru, SP, Brazil.
- Butto, A., Dantas, I. (2011). Autonomia e cidadania: Políticas de organização produtiva para as mulheres no meio rural. Ministério do Desenvolvimento Agrário. 1º Edição. Brasília.
- Camilloni, I. A., Barros, V. R., Moreiras, S., Poveda, G., & Tomasella, J. (2020). Floods and droughts. <https://ri.conicet.gov.ar/handle/11336/146904>
- Cervantes-Zapana, M., Yagüe, J. L., De Nicolás, V. L., & Ramirez, A. (2020). Benefits of public procurement from family farming in Latin-AMERICAN countries: Identification and prioritization. *Journal of Cleaner Production*, 277, 123466.
<https://doi.org/10.1016/j.jclepro.2020.123466>
- Cerny, P. G. (1995). Globalization and the changing logic of collective action. *International Organization*, 49(04), 595-625. <https://doi.org/10.1017/S0020818300028459>
- Cherry, E. (2021). Vegan studies in sociology. In *The Routledge Handbook of Vegan Studies* (pp. 150-160). Routledge.
- CONTAG. (2017). *Sistema Confederativo CONTAG reage a cortes no orçamento para a Agricultura Familiar*. CONTAG Official announcement: Confederative System reacts to budget cuts for Family Agriculture
<http://www.contag.org.br/index.php?modulo=portal&acao=interna&codpag=101&id=12535&mt=1&nw=1>
- Cordeiro, J., & Filipe, J. (2004). The semiotic pentagram framework--a perspective on the use of semiotics within organisational semiotics. In *Proceedings of the 7th International Workshop on Organisational Semiotics*.
<http://citeseerx.ist.psu.edu/viewdoc/similar?doi=10.1.1.60.8945&type=ab>
- Dantas, M., & Ikeda, S. (2017). Mapping the Current Condition of Solidarity Economy and Family Farming in RN, Northeast of Brazil. *European Journal of Sustainable Development*, 6(3), 473-473. <https://doi.org/10.14207/ejsd.2017.v6n3p473>
- Dantas, M., & Silva, G. (2018, May). The Xique-Xique Network towards sustainability and solidarity. In *IOP Conference Series: Earth and Environmental Science*, 151(1). IOP Publishing. <http://iopscience.iop.org/article/10.1088/1755-1315/151/1/012014/pdf>
- Dantas, M. (2020). The Role of Institutions in Promoting Resilience in the Development of Sustainable Food Systems: The Farmer's Perspective in the Northeast of Brazil. In *Universities and Sustainable Communities: Meeting the Goals of the Agenda 2030* (pp. 651-666). Springer, Cham. https://doi.org/10.1007/978-3-030-30306-8_39
- de Araújo Palmeira, P., de Araújo Mattos, R., Pérez-Escamilla, R., & Salles-Costa, R. (2021). Multisectoral government programs and household food insecurity: evidence from a longitudinal study in the semi-arid area of Northeast, Brazil. *Food Security*, 13(3), 525-538.
- de Carvalho, A. M., Verly, E. Jr, Marchioni, D. M., & Jones, A. D. (2021). Measuring sustainable food systems in Brazil: A framework and multidimensional index to evaluate

- socioeconomic, nutritional, and environmental aspects. *World Development*, 143, 105470. <https://doi.org/10.1016/j.worlddev.2021.105470>
- Devaux, A., Velasco, C., López, G., Bernet, T., Ordinola, M., Pico, H., . . . Horton, D. (2007). Collective action for innovation and small farmer market access: The papa andina experience.
- dos Santos, E. P., & Santos, J. C. O. (2020). Use of Medicinal Plants of Brazilian Caatinga in a Perspective of Solidarity Economy.
- Ericksen, P. J. (2007). Conceptualizing food systems for global environmental change research. *Global Environmental Change*. 18(1), 234–245. <https://doi.org/10.1016/j.gloenvcha.2007.09.002>
- Façanha, I. P. (2019). Gênero e água: uma Leitura sobre as Políticas no Semiárido e a Inclusão Feminina. *Desenvolvimento Em Questão*, 17(47), 339–356. <https://doi.org/10.21527/2237-6453.2019.47.339-356>
- Faires, N. (2015). *Food Confidential: The Corporate Takeover of Food Security and the Family Farm—and What to Do About It*. Simon and Schuster. <http://www.foodcircles.missouri.edu/whstudy.pdf>
- FAO. (2014). Family farming is part of the solution to the hunger problem. <http://www.fao.org/zhc/detail-events/en/c/270855/>
- FAO. (2014). The state of food and agriculture (SOFA). Rome: FAO.
- FAO. (2014). The state of food and agriculture (SOFA).
- FAO. (2015). Sustainable Development Goals. <http://www.fao.org/sustainable-development-goals/goals/goal-1/hu/>
- Favero, M., A. *A universidade brasileira em busca de sua identidade*. Petrópolis. [The Brazilian university in search of its identity]. Vozes, 1977. 102 p.
- Gaard, G. (2011). Feminist Formations. *Ecofeminism Revisited: Rejecting Essentialism and Re-Placing Species in a Material Feminist Environmentalism*. Baltimore Vol. 23, Iss. 2 (Summer 2011): 26-53
- Gaiger, L. I. (2004). A economia solidária e o projeto de outra mundialização. [The solidarity economy and the project of another globalization]. *DADOS-Revista De Ciências Sociais*, 47(4). <https://doi.org/10.1590/S0011-52582004000400006>
- Gaiger, L. I. (2017). The solidarity economy in South and North America: Converging experiences. *Brazilian Political Science Review*, 11. <https://doi.org/10.1590/1981-3821201700030002>
- Gaiger, L. I. (2011). *Relações entre equidade e viabilidade nos empreendimentos solidários*. *Lua Nova: Revista de Cultura e Política*. [Relations between equity and viability in solidarity enterprises. *Journal of Culture and Politics*], 79-109.
- Gaio, D. M. (2008). A concepção de modernização na política de cooperação entre MEC e a USAID. [The concept of modernization in the cooperation policy between MEC and USAID]. <https://repositorio.unb.br/handle/10482/2106>
- Galindo, E. et al. *Efeitos da pandemia na alimentação e na situação da segurança alimentar no Brasil*. [Effects of the pandemic on food and the food security situation in Brazil] Working Paper Series Food for Justice, 2021.
- Gallopín, G. C. (2003). *A systems approach to sustainability and sustainable development*. ECLAC. <https://repositorio.cepal.org/handle/11362/5759>
- Goertzel, T. *Mec-Usaid : ideologia norte-americana na educação brasileira*. [North American ideology in Brazilian education. *Brazilian Civilization Magazine*]. *Revista Civilização Brasileira*. Rio de Janeiro, v. 3, n. 14, p. 123-138, jul. 1967.

- Gollin, D., Hansen, C. W., & Wingender, A. M. (2021). When agriculture drives development: Lessons from the Green Revolution. <https://voxeu.org/article/when-agriculture-drives-development>
- Guimarães, C. (2017). Censo agropecuário: Que realidade do campo brasileiro se quer mostrar? *Articulação Nacional De Agroecologia*. <https://agroecologia.org.br/2017/04/06/censo-agropecuario-que-realidade-do-campo-brasileiro-se-quer-mostrar/>
- Guimarães, R. P. (1991). Bureaucracy and ecopolitics in the third world: Environmental policy formation in Brazil. *International Sociology*, 6(1), 73-96. <https://doi.org/10.1177/026858091006001005>
- Gutberlet, J., Besen, G. R., & Morais, L. P. (2020). Participatory solid waste governance and the role of social and solidarity economy: Experiences from São Paulo, Brazil. *Detritus*, 13(13), 167-180.
- Guzmán, G. I., López, D., Román, L., & Alonso, A. M. (2013). Participatory action research in agroecology: Building local organic food networks in Spain. *Agroecology and Sustainable Food Systems*, 37(1), 127-146.
- Herrera Ortuño, J. (2021). Práticas, materialidades e feminismos em devir: reterritorialização no caso da rede Xique Xique de comercialização solidária.
- Heffernan, W. D., Hendrickson, M., & Gronski, R. (1999). Consolidation in the Food and Agriculture System. *Sustainable Agriculture*.
- IBGE. (2009). O censo agropecuário 2006 e a agricultura familiar no Brasil / Caio Galvão de França; Mauro Eduardo Del Grossi; Vicente P. M. de Azevedo Marques. – Brasília: MDA, 2009. <http://www.bb.com.br/docs/pub/siteEsp/agro/dwn/CensoAgropecuario.pdf><http://www.bb.com.br/docs/pub/siteEsp/agro/dwn/CensoAgropecuario.pdf>
- Ingram, J. (2011). A food systems approach to researching food security and its interactions with global environmental change. *Food security*, 3(4), 417-431. <https://doi.org/10.1007/s12571-011-0149-9>
- IPES-Food, 2017. Unravelling the Food-Health Nexus: Addressing practices, political economy, and power relations to build healthier food systems. The Global Alliance for the Future of Food and IPES-Food.
- Kamphuis, C. B., Jansen, T., Mackenbach, J. P., Van Lenthe, F. J. (2015). Bourdieu's Cultural Capital in Relation to Food Choices: A Systematic Review of Cultural Capital Indicators and an Empirical Proof of Concept. *PLoS One*. 10(8):e0130695. doi: 10.1371/journal.pone.0130695. PMID: 26244763; PMCID: PMC4526463.
- Kay, C. (2019). Land reform in Latin America: past, present, and future. *Latin American Research Review*, 54(3), 747-755. <https://doi.org/10.25222/larr.517>
- Kelly, P. J. (2005). Practical suggestions for community interventions using participatory action research. *Public Health Nursing*, 22(1), 65-73. <https://doi.org/10.1111/j.0737-1209.2005.22110.x>
- Kiill, L. H. P. (2011). EMBRAPA (gov). Caatinga Patrimônio Brasileiro Ameaçado. <https://www.infoteca.cnptia.embrapa.br/bitstream/doc/899060/1/Kiill2011.pdf>
- Larsen, M. H. (2020). Integrating and innovating food design and sociology—healthy eating. In *Experiencing Food, Designing Sustainable and Social Practices* (pp. 104-108). CRC Press.
- Laurie, N. (2011). Gender Water Networks: Femininity and Masculinity in Water Politics in Bolivia. *International Journal of urban and Regional Research*, 35(1), p. 172-188.

- Lechat, N. (2009). Organizing for the solidarity economy in south Brazil. *The social economy: international perspectives on economic solidarity*, 159-175.
- Lima, M. M. T., & de Jesus, V. B. (2016). Sem mulheres existe agroecologia? *Revista Eletrônica de Jornalismo Científico*, (2011).
<https://www.comciencia.br/comciencia/handler.php?section=8&edicao=127&id=1538>
- Marengo, J. A., Galdos, M. V., Challinor, A., Cunha, A. P., Marin, F. R., Vianna, M. D. S., Alvala, R. C. S., Alves, L. M., Moraes, O. L., & Bender, F. (2021). Drought in Northeast Brazil: A review of agricultural and policy adaptation options for food security. *Climate Resilience and Sustainability*. <https://doi.org/10.1002/cli2.17>
- Martins, E. S. P., Quintana, C. M., Dias, M. A. F. S., Silva, R. F. V., Biazeto, B., Forattini, G. D., & Martins, J. C. (2016). The technical and institutional case: The Northeast drought monitor as the anchor and facilitator of collaboration. In *Drought in Brazil* (pp. 53-64). CRC Press.
- Mayton, H., Beal, T., Rubin, J., Sanchez, A., Heller, M., Hoey, L., de Haan, S., Duong, T. T., Huynh, T., Burra, D. D., Houry, C. K., & Jones, A. D. (2020). Conceptualizing sustainable diets in Vietnam: Minimum metrics and potential leverage points. *Food Policy*, 91, 101836. <https://doi.org/10.1016/j.foodpol.2020.101836>
- Martinez-Torres, M. E., & Rosset, P. M. (2010). La vía campesina: The birth and evolution of a transnational social movement. *The Journal of Peasant Studies*, 37(1), 149-175.
<https://doi.org/10.1080/03066150903498804>
- MAPA gov. (n/d). Ministério da Agricultura, Pecuária e Abastecimento.
<http://www.agricultura.gov.br/http://www.agricultura.gov.br/>
- MST. (n.d). MST History journal. *Nossa História*. <http://www.mst.org.br/nossa-historia/inicio>
- MDA gov. (2006). Ministério do Desenvolvimento Agrícola: Consolidação das políticas públicas para o fortalecimento da agricultura familiar como eixo de desenvolvimento. Brazil.
http://www.undp.org/content/dam/undp/documents/projects/BRA/00044688_PCT%20PNUD%20versao%2002-02-06.doc
- McMichael, P. (2013). Food regimes and agrarian questions: Agrarian change and peasant studies. *Nova Scotia, Canada: Fernwood Publishing*.
- Mendell, M. (2009). The three pillars of the social economy: the Quebec experience. *The social economy: International Perspectives on Economic Solidarity* (Ed. Ash, A.). London: Zed Books, 176-207.
- Mendell, M. Neamtan, N. (2016). The Social Economy in Quebec: Towards a New Political Economy". *Researching the Social Economy*, edited by Laurie Mook, Jack Quarter and Sherida Ryan, Toronto: University of Toronto Press, pp. 63-83.
<https://doi.org/10.3138/9781442660281-005>
- Melo, M. T. S. M., Moura, A. C. C., Silva, B. L. D. S., Santos, M. D. D. C. D., Paz, S. M. R. S. D., Santos, M. M. D., & Carvalho, C. M. R. G. D. (2021). Nutritional characterization of the typical food menu offered in the public market and its reflection on health. *Journal of Culinary Science & Technology*, 19(2), 138-148.
<https://doi.org/10.1080/15428052.2020.1733162>
- Mies, M., & Shiva, V. (1993). 19. People or Population: Towards a New Ecology of Reproduction. <http://hdl.handle.net/10822/860658>
- Mikawlawng, K., Kumar, S., & Vandana, R. (2014). Current scenario of urolithiasis and the use of medicinal plants as antiurolithiatic agents in Manipur (Northeast India): A review. *International Journal of herbal medicine*, 2(1), 1-12.
- Mitidiero Junior, M. A., Barbosa, H., & de Sá, T. (2017). Quem produz comida para os

- brasileiros? 10 anos do censo agropecuário 2006. [Who produces the food for Brazilians? 10 years of the agricultural Census] 18(3). <https://doi.org/10.33026/peg.v18i3.5540>
- Moura, A. C. C., Melo, M. T. S. M., Silva, B. L. D. S., Paz, S. M. R. S. D., Paiva, A. D. A., & Carvalho, C. M. R. G. D. (2020). An approach on food choice determinants: a study in the restaurants of a public market in Northeastern Brazil. *Revista de Nutrição*, 33. <https://doi.org/10.1590/1678-9865202033e190126>
- Motta, R. (2021). Social movements as agents of change: Fighting intersectional food inequalities, building food as webs of life. *The Sociological Review*, 69(3), 603-625.
- MST. (n.d.). Nossa historia. Retrieved from <http://www.mst.org.br/nossa-historia/inicio>
- Nestle, M. (2013). *Food politics: How the food industry influences nutrition and health*. University of California Press. <https://doi.org/10.1525/9780520955066>
- Niederle, P., Grisa, C., Picolotto, E. L., & Soldera, D. (2019). Narrative disputes over family-farming public policies in Brazil: conservative attacks and restricted countermovements. *Latin American Research Review*, 54(3), 707-720. <https://doi.org/10.25222/larr.366>.
- North, D. C. (1991). Institutions. *Journal of Economic Perspectives*, 5(1): 97-112.
- Norstedt, M., & Breimo, J. P. (2016). Moving beyond everyday life in institutional ethnographies: Methodological challenges and ethical dilemmas. In *Forum: Qualitative Research*, 17(2), Art. 3. <http://nbn-resolving.de/urn:nbn:de:0114-fqs160238>.
- Novovic, G. (2021). *Contextualizing Gender Equality: Gender Mainstreaming between Global Governance Frameworks and National and Institutional Policy Agendas in Kenya, Rwanda, and Uganda* (Doctoral dissertation, University of Guelph).
- OECD/FAO (2015), OECD-FAO Agricultural Outlook 2015, OECD Publishing, Paris, https://doi.org/10.1787/agr_outlook-2015-en. oecd
- Oliveira, M. S. D. S., & Santos, L. A. D. S. (2020). Dietary guidelines for Brazilian population: an analysis from the cultural and social dimensions of food. *Ciencia & Saude Coletiva*, 25, 2519-2528. <https://doi.org/10.1590/1413-81232020257.22322018>
- Otsuki, K., & Castro, F. D. (2020). Solidarity Economy in Brazil: Towards Institutionalization of Sharing and Agroecological Practices. In *Sharing Ecosystem Services* (pp. 159-178). Springer, Singapore.
- Pangelinan, D. M. (2021). *The Sociology of Food and Eating*.
- Pacheco, M. E. L. (2002). Agricultura Familiar: sustentabilidade ambiental e igualdade de gênero. *Perspectivas de Gênero: Debates e questões para as ONGs*. Recife: GTGênero. Plataforma de Contrapartes Novib/SOS Corpo Gênero e Cidadania, 138-161.
- Pérez Marina, D. (2009). *Anthropocentrism and Androcentrism – An Ecofeminist Connection*. Södertörns högskola, Institutionen för Kultur och Kommunikation.
- Poirier, Y. (2014). Social Solidarity Economy and related concepts Origins and Definitions: An International Perspective. RIPESS. Quebec, Canada. <http://www.ripess.org/wp-content/uploads/2017/09/Solidarity-Economy-and-other-Concepts-Poirier-July-2014.pdf>
- Qualman, D., Akram-Lodhi, A. H., Desmarais, A. A., & Srinivasan, S. (2018). Forever young? The crisis of generational renewal on Canada's farms. *Canadian Food Studies / La Revue Canadienne Des études Sur l'alimentation*, 5(3), 100–127. <https://doi.org/10.15353/cfs-rcea.v5i3.284>.
- Qualman, E. (2011). *How social media transforms the way we live and do business*. Ipswich, MA: Business Book Summaries.
- Quisumbing, A.R. Meinzen-Dick, R. Raney, T.L. Croppenstedt, A. Behrman, J. Peterman A. (2015). *Gender in agriculture: Closing the knowledge gap*, Springer, Netherlands.

- RIPESS org. Global Vision for a Social Solidarity Economy: Convergences and Differences in Concepts, Definitions and Frameworks. http://www.ripess.org/wp-content/uploads/2017/08/RIPESS_Vision-Global_EN.pdf
- Rocha, C. (2001). Urban Food Security Policy: The Case of Belo Horizonte, Brazil, *Journal for the Study of Food and Society*, 5:1, 36-47, DOI: 10.2752/152897901786732735.
- Rondeau, S. O. (2020). Recension de The Sociology of Food and Agriculture de Michael Carolan. *Canadian Food Studies/La Revue canadienne des études sur l'alimentation*, 7(1), 184-188.
- Rodorff, V., Siegmund-Schultze, M., Guschal, M., Hölzl, S., & Köppel, J. (2019). Good governance: A framework for implementing sustainable land management, applied to an agricultural case in Northeast-Brazil. *Sustainability*, 11(16), 4303. <https://doi.org/10.3390/su11164303>
- Rosendo, D., & Kuhnen, T. (2019). Ecofeminism. Encyclopedia of the UN Sustainable Development Goals. https://doi.org/10.1007/978-3-319-70060-1_41-1
- Romano, O., & Akhmouch, A. (2019). Water governance in cities: Current trends and future challenges. *Water*, 11(3), 500. <https://doi.org/10.3390/w11030500>
- Sandelowski, M. (1996). One is the liveliest number: The case orientation of qualitative research. *Research in Nursing & Health*, 19(6), 525-529. [https://doi.org/10.1002/\(SICI\)1098-240X\(199612\)19:6<525::AID-NUR8>3.0.CO;2-Q](https://doi.org/10.1002/(SICI)1098-240X(199612)19:6<525::AID-NUR8>3.0.CO;2-Q)
- Santos, K., Gonçalves, h., Sequeira, T., & Diniz, F. (2019). Development and solidarity economy strategies in brazil: Case studies. *Regional Science Inquiry*, 11(1), 153-165.
- Salatin, J. (2011). *Folks, this ain't normal: A farmer's advice for happier hens, healthier people, and a better world*. Hachette UK.
- Seiz, J.A. (2011). Agarwal, Bina. In: Chatterjee, D.K. (eds) Encyclopedia of Global Justice. Springer, Dordrecht. https://doi.org/10.1007/978-1-4020-9160-5_412
- Shiva, V. (2014). *The Vandana Shiva Reader*. University Press of Kentucky. Chapter: Toward a New Agriculture Paradigm - Health per Acre (pp. 113-138).
- Shimizu, T. (2019). < Summary > Changing Family Farming in Latin America. *The Natural Resource Economics Review*, 89-92.
- Schlosser, E. (2001). Fast Food Nation: The Dark Side of the All-American Meal.
- Siliprandi, E. (2015). *Mulheres e Agroecologia: Transformando o Campo, as Florestas e as Pessoas*. Rio de Janeiro, Brazil: Editora UFRJ.
- Sims, J., & Romero, J. (2014). Latin American debt crisis of the 1980s. Federal Reserve Bank of Chicago and Federal Reserve Bank of Richmond.
- Stamper, R., Liu, K., Hafkamp, M., & Ades, Y. (2000). Understanding the roles of signs and norms in organizations-a semiotic approach to information systems design. *Behaviour & Information Technology*, 19(1), 15-27. <https://doi.org/10.1080/014492900118768>
- Sriram, V. (2018). Achieving Gender Equality and Women's Empowerment in Smallholder Adaptation: Lessons from IFAD's Adaptation in Smallholder Agriculture Programme. CCAFS Info Note. Wageningen, the Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). <https://hdl.handle.net/10568/91537>
- Sabourin, E., Craviotti, C., & Milhorange, C. (2020). The dismantling of family farming policies in Brazil and Argentina. *International Review of Public Policy*, 2(2: 1), 45-67. <https://doi.org/10.4000/irpp.799>
- Saito, O. (2020). *Sharing Ecosystem Services*. Springer Singapore.
- Seconda, L., Baudry, J., Pointereau, P., Lacour, C., Langevin, B., Herberg, S., Lairon, D., Allès, B., & Kesse-Guyot, E. (2019). Development and validation of an individual sustainable

- diet index in the NutriNet-Santé study cohort. *British Journal of Nutrition*, 121(10), 1166-1177. <https://doi.org/10.1017/S0007114519000369>
- Siegmund-Schultze, M., Rodorff, V., Köppel, J., & do Carmo Sobral, M. (2015). Paternalism or participatory governance? Efforts and obstacles in implementing the Brazilian water policy in a large watershed. *Land Use Policy*, 48, 120-130. <https://doi.org/10.1016/j.landusepol.2015.05.024>
- Streubert, H. J., & Carpenter, D. R. (2002). *Qualitative research in nursing: Advancing the humanistic imperative* (3rd ed.). Philadelphia: Lippincott Williams & Wilkins.
- Tanaka, K. (2020). Justice and Tyranny: Bringing “Rural” Back into the Sociology of Food and Agriculture. *Rural Sociology*, 85(1), 3-21.
- Tarlau, R. (2015). How do new critical pedagogies develop? Educational innovation, social change, and landless workers in Brazil. *Teachers College Record*, 117(11). <https://doi.org/10.1177/016146811511701103>
- Tom, M. S., Fischbeck, P. S., & Hendrickson, C. T. (2016). Energy use, blue water footprint, and greenhouse gas emissions for current food consumption patterns and dietary recommendations in the US. *Environment Systems and Decisions*, 36(1), 92-103. <https://doi.org/10.1007/s10669-015-9577-y>
- Turner, B. L., Kasperson, R. E., Matson, P. A., McCarthy, J. J., Corell, R. W., Christensen, L., Eckley, N., Kasperson, J. X., Luers, J., Martello, M. L., Polsky, C., Pulsipher, A., & Schiller, A. (2003). A framework for vulnerability analysis in sustainability science. *Proceedings of the national academy of sciences*, 100(14), 8074-8079. <https://doi.org/10.1073/pnas.1231335100>
- United Nations, Department of Economic and Social Affairs Sustainable Development (n/d). The 17 Sustainable Development Goals. Available at <https://sdgs.un.org/goals#goals>.
- United Nations, General Assembly (2015). Sustainable Development Summit 2015. Available at <https://sustainabledevelopment.un.org/post2015/summit>.
- Visual Capitalist. (2021). The 50 Most Visited Websites in the World. Published by Dorothy Neufeld. <https://www.visualcapitalist.com/the-50-most-visited-websites-in-the-world/>
- Villamayor-Tomas, S., Grundmann, P., Epstein, G., Evans, T., & Kimmich, C. (2015). The water-energy-food security nexus through the lenses of the value chain and the institutional analysis and development frameworks. *Water Alternatives*, 8(1), 735-755. <https://arizona.pure.elsevier.com/en/publications/the-water-energy-food-security-nexus-through-the-lenses-of-the-va>
- Vasileiou, K., Barnett, J., Thorpe, S., & Young, T. (2018). Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. *BMC Medical Research Methodology*, 18(1), 1-18. <https://doi.org/10.1186/s12874-018-0594-7>
- Wang, L., Gao, B., Hu, Y., Huang, W., & Cui, S. (2020). Environmental effects of sustainability-oriented diet transition in China. *Resources, Conservation and Recycling*, 158, 104802. <https://doi.org/10.1016/j.resconrec.2020.104802>
- Wiggins, S. (2016). Agricultural and rural development reconsidered: A guide to issues and debates. IFAD Research Series 1. <https://ssrn.com/abstract=3284413>
- Web Cookies. (2020). In Wikipedia.
- Yasbek, C. M. (2004). *O programa fome zero no contexto das políticas sociais brasileiras*. [The Zero Hunger Program in the Context of Brazilian Social Policies]. São Paulo em Perspectiva, Volume: 18, Issue: 2. <https://doi.org/10.1590/S0102-88392004000200011>

Appendices:**Appendix A: Information and Consent Form****INFORMATION AND CONSENT FORM**

Office of Research – Research Ethics Unit – GM 900 – 514-848-2424 ext. 7481 – mail to: oor.ethics@concordia.ca – www.concordia.ca/offices/oor.html

Study Title: Pursuing Sustainability in Food Systems thru Community Development.

Researcher: Monica Dantas

Researcher’s Contact Information: macndantas@gmail.com 1-514-503-0121

Faculty Supervisor: Dr. Satoshi Ikeda

Faculty Supervisor’s Contact Information: satoshi.ikeda@concordia.ca

Source of funding for the study: Have applied for IDRC Doctoral research award, awaiting results (October 2017).

You are being invited to participate in the research study mentioned above. This form provides information about what participating would mean. Please read it carefully before deciding if you want to participate or not. If there is anything you do not understand, or if you want more information, please ask the researcher.

A. PURPOSE

We are interested in understanding the current conditions of the solidarity economy as well as the conditions of family farming in Brazil and especially in the Northeast. To search for a scientific process that may be more relevant to communities and their environment, we explored more inclusive research approaches. The approach proposed in this study is to use the Participatory Action Research (PAR) processes in the design of research and implementation during fieldwork.

A questionnaire will contribute to the first phase of this study which aims to understand the broader context for designing a PAR with a specific group of family farmers who practice the SEE. The second phase will be built considering actors, problems and ideas of solutions identified by the processes of PAR and people involved in the first phase.

B. PROCEDURES

In the first phase you will be presented with relevant information for each topic providing you context then you will be asked to answer some questions about the subject.

The questionnaire should take about 20 to 30 to complete. The second phase of the research may involve other questionnaires or your participation in workshops where the discussions, decisions and processes will be collected as data for the study.

C. RISKS AND BENEFITS

This research is not necessarily intended to benefit you personally.

Risks may involve not achieving the stated objectives and establishing a reliance on any resources made available only during the investigation period. This would be contrary to the goal of establishing self-resilient communities within the concept of sustainable development. A simple strategic way to reduce risk and at the same time increase the likelihood of producing positive effects for the population involved is to include them in the research design process. Given this, the approach chosen in this study allows the participation of those involved from planning to implementation.

D. CONFIDENTIALITY

Rest assured that your answers will be kept completely confidential. We will not allow anyone to access the information except the people directly involved in the research. We will use only the information for the purposes of the research described in this form.

We want to publish the search results. However, you will not be able identifiable in published results. If you choose to withdraw the information provided prior to publication, your choice will be honoured.

F. CONDITIONS OF PARTICIPATION

You do not have to participate in this survey. It is purely your decision. If you participate, you can stop at any time. You can also request that the information you provide is not used and your choice will be respected. If you decide you do not want us to use your information, please inform the researcher before October 2017.

There are no negative consequences for not participating, stopping in the middle, or asking us not to use your information.

G. PARTICIPANT'S DECLARATION

I have read and understood this form. I had the opportunity to ask questions and any questions were answered. By signing below, you acknowledge that your participation in the study is voluntary, that you are 18 years of age or older, and that you are aware that you may choose to terminate your study participation at any time and for any reason.

NAME (please **print**)

SIGNATURE

DATE

If you have questions about the scientific or scholarly aspects of this research, please contact the researcher. Their contact information is on page 1. You may also contact their faculty supervisor.

If you have concerns about ethical issues in this research, please contact the Manager, Research Ethics, Concordia University, 514.848.2424 ex. 7481 or oor.ethics@concordia.ca.

Appendix B: Letter of cooperation from AACC



Associação de Apoio às Comunidades do Campo do Rio Grande do Norte
Rua 29 de Outubro, s/ nº, Centro – João Câmara/RN. CNPJ: 09.390.295/0002-05 Natal/RN
Rua Dr. Múcio Galvão, 449, Lagoa Seca - 59022-530 - Natal/RN CNPJ: 09.390.295/0001-24
Tel. (84)3211-6131 E-mail: aaccrn@aaccrn.org.br Site: www.aaccrn.org.br

Natal/RN, 30 de maio de 2017.

DECLARAÇÃO

Por meio desta, declaramos a parceria da AACC com a pesquisadora Monica Dantas, estudante da Universidade de Concordia Montreal, na pesquisa “Buscando a Sustentabilidade em Sistemas Alimentares através do Desenvolvimento Comunitário”.

Tal apoio se dá em conformidade com a missão de “contribuir com a autodeterminação de mulheres e homens do campo e da cidade, no Nordeste Brasileiro, visando uma sociedade sustentável”.

Assim, a pesquisas proposta pela Sra. Mônica Dantas, se dará tendo como base processos participativos relacionados a tema de alta relevância para nossa missão institucional. Portanto a AACC se coloca como parceira da pesquisa com a indicação de Lidiane Freire, assessora técnica em economia solidária como interlocutora, dando apoio as articulações e mobilizações necessárias para a pesquisadora entrar em contato com a população alvo da proposta.

A handwritten signature in blue ink, enclosed in a blue oval. The signature appears to read 'Marialda Moura da Silva'.

Marialda Moura da Silva
Coordenadora Geral da AACC/RN

Appendix C: Certificate of Ethical Acceptability



CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Monica Dantas
Department: Faculty of Arts and Science\Sociology & Anthropology
Agency: N/A
Title of Project: Pursuing Sustainability in Food Systems thru
Community Development
Certification Number: 30008198
Valid From: August 10, 2017 **To:** August 09, 2018

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

A handwritten signature in black ink, appearing to read "J. Pfaus".

Dr. James Pfaus, Chair, University Human Research Ethics Committee

Appendix D: Research-Creation initial proposal and fieldwork templates – Portuguese

Com intuito de buscar processo científico que possa ser mais relevante a comunidades e ao seu meio ambiente foram exploradas abordagens inclusivas de pesquisa. Uma forma estratégica simples para diminuir riscos e aumentar a probabilidade de produzir efeitos positivos para a população envolvida é inclui-la no processo de concepção da investigação, especialmente quando se trabalha com grupos minoritários ou menos favorecidos. Dessa forma, a abordagem proposta neste estudo é utilizar os processos de Pesquisa-Ação Participativa - PAR no desenho da pesquisa e na duração do trabalho de campo e análise.

PAR envolve processos coletivos de planejamento e implementação, que se destina a compreender um grupo de pessoas, alterando-o. Geralmente é visto como uma abordagem eficaz para mudar condições desejadas em grupos, pois, em primeiro lugar, funciona em ciclos contínuos, se a primeira tentativa não produz os resultados esperados, o grupo pode refletir e remodelar o plano e ações até que as mudanças desejadas sejam alcançadas. Em segundo lugar, porque é um processo coletivo em que o pesquisador e a população envolvida o farão juntos. Essencialmente PAR é composto de quatro processos coletivos primeiro é mapear as questões e planejar ações para mudar as condições, segundo implementar ações para a mudança, terceira medida e analisar os efeitos, adiante refletir sobre a abordagem, recomeçar o ciclo de acordo com o que foi refletido.

1. PAR inicial

Objetivos - Compreender o contexto local e a experiencia dos atores que compõe a agricultura familiar e SSE para conceber um PAR destinado a um grupo específico de agricultores familiares que praticam a SSE.

Contexto:

A SSE no Estado do RN e no Brasil

Mapeamento das principais questões na área da SSE e Agricultura Familiar

Mapeamento de ideias ou soluções para combater problemas

Mapeamento de objetivos comuns

Aproximação de grupos / comunidades que trabalham com a agricultura familiar no Nordeste do Brasil.

Identificar possíveis colaboradoras para constituir a equipe de investigação durante a segunda fase

2. PAR contínuo

Objetivo - Melhor compreensão do grupo pesquisado com objetivo de imaginar estratégias para mudar as condições de vida dos seus participantes.

As questões e objetivos serão definidos com a equipe e o grupo envolvido após a análise dos resultados da pesquisa preliminar.

4. Trabalho de Campo

Primeiro passo envolve convite e a aplicação de um survey com população semi-aleatória que será direcionada a grupos de pessoas específicos identificados como grupos de interesse nestas áreas, serão dois temas: economia social e solidária - SSE e agricultura familiar. Após a apreciação do curto parágrafo de contextualização sobre os temas os respondentes podem responder livremente inclusive discordando ou não da descrição oferecidas para cada tema. Os questionários foram planejados como entrevista oral a ser gravado em áudio digital.

Instruções e informações para o trabalho de campo

O primeiro passo é o convite, estabelecimento de acordos e a leitura e assinatura do formulário de consentimento informado. O pesquisador introduz a pesquisa e fornece o formulário ao entrevistado.

A entrevista foi pensada a ter um formato informal de conversa casual, o entrevistador tem um papel de facilitador e moderador da conversa, por exemplo o entrevistador deve tentar cultivar as respostas pontuais e manter a conversa concisa para que a entrevista não fique muito longa. Por tanto é importante nutrir um período que seja suficiente para respostas abertas e ao mesmo tempo breve. A meta de tempo para a entrevista é de 30 a 40 minutos.

Sugestões de participantes para perguntas relevantes a ser adicionadas a pesquisa, serão registradas para compor a segunda etapa. As sugestões sobre direcionamento e perguntas de pesquisa também serão consideradas.

METAS

Meta de tempo: 30 a 40 min por entrevista

Número de entrevistas: 20 – 30 entrevistas

Sendo que 10 a 20 entrevistas devem ser feitas com atores diretamente envolvidos (Questionário 3), a segunda prioridade é para entrevistas com agentes de desenvolvimento comunitário ou economia solidária (Questionário 2), em menor volume entrevistas com a ativistas, economistas, políticos ou acadêmicos (Questionário 1).

Cada grupo de interesse terá um roteiro de perguntas voltadas a eles:

Questionário 1 - destinado a ativistas, economistas, políticos ou acadêmicos

Questionário 2 - para ser respondido por agentes de desenvolvimento comunitário ou economia solidária (ex. AACC)

Questionário 3 - Perguntas a serem feitas aos atores diretamente envolvidos (artesãos, agricultores familiares, empreendedores sociais) (ex. Membros da Rede Xique-Xique)

Dados demográficos a ser registrados de forma voluntária:

- Cidade
- Idade
- Etnia
- Identidade de gênero
- Ocupação

**Questionário 1 - dirigido a ativistas, economistas, políticos ou acadêmicos:
Perguntas sobre a situação da Economia Social e Solidária - SSE no Brasil**

1. Quais instituições dão suporte a economia social solidária SSE?
2. Quais instituições beneficiaram a SSE entre 1992 e 2002? Indique o nome das instituições e qual foi o seu papel principal?
3. Quais instituições beneficiaram a SSE entre 2003 e 2016? Indique o nome das instituições e qual foi o seu papel principal?
4. Você pode comparar a SSE no Brasil hoje com a SSE durante os governos do PT? Em termos de infraestrutura institucional e budget?
5. Você pode citar e divulgar o papel principal das entidades / instituições e se a mudança de direcionamento governamental afetou as suas atuações?
6. Você pode falar também se ou como as mudanças no Ministério da Cultura (extinto) afetaram a SSE?
7. Qual é a importância dos espaços institucionais de apoio à Economia Social e Solidária – SSE?
8. Como você descreveria o desenvolvimento da SSE em microrregiões e localidades no Brasil?
9. Quais os principais obstáculos para o desenvolvimento da SSE?
10. Quais são as principais vulnerabilidades da SSE à retirada das estruturas institucionais a nível federal? Analise a resiliência do setor.
11. Durante o período político favorável você acha que foram criadas suficientes estruturas autônomas que diminuíram a dependência da SSE as políticas governamentais de suporte?

Questionário 1 – continuação do survey com as perguntas sobre Agricultura Familiar

12. Você pode falar sobre o Ministério do Desenvolvimento Agrário MDA? Qual era o seu papel?
13. Você pode comparar o extinto MDA com a nova Secretaria Especial de Agricultura Familiar e Desenvolvimento Agrícola que obteve a carteira reorganizada do último ministério ligado sob a Casa Civil?
14. Na sua opinião, quais foram as principais contribuições e desapontamentos durante o período político mais favorável a agricultura familiar entre 2003 e 2015?
15. Quais são as principais questões da agricultura familiar hoje?

16. Você pode oferecer uma ideia aos agricultores familiares para aumentar a renda da agricultura orgânica? (Ex. Uma ideia sobre como resolver os problemas que você apontou anteriormente)
17. Em sua opinião, quão vulnerável à agricultura familiar é a retirada das estruturas institucionais federais que apoiam o setor?
18. Como você vê o futuro da agricultura familiar?

Questionário 2 - respondido por agentes de desenvolvimento comunitário
Perguntas sobre as condições atuais da SSE no Brasil

1. Compare o suporte a SSE entre dois períodos políticos recentes o primeiro de 1992-2002 entre o segundo de 2003-2016?
2. Qual é a importância dos espaços institucionais de apoio à SSE em sua atuação como agente de desenvolvimento de comunidades rurais?
3. Você percebe o desenvolvimento da SSE em microrregiões e localidades no Brasil?
4. Quais os principais obstáculos para o desenvolvimento da SSE e que afetam o suporte oferecido pela sua agência de desenvolvimento?
5. Durante o período político favorável você acha que foram criadas estruturas autônomas que diminuíram a dependência da SSE as políticas do Estado?
6. Aponte na sua visão quais os maiores desafios para ESS no contingente atual?
7. Como uma pesquisa científica poderia contribuir para o desenvolvimento da ESS? Quais questões de pesquisas deveriam ser incluídas? Qual seria a utilidade dos resultados de tal pesquisas para a sua experiência?

Questionário 2 – Continuação: perguntas sobre Agricultura Familiar no Brasil

8. Compare a atuação do extinto MDA com a da nova Secretaria Especial de Agricultura Familiar e Desenvolvimento Agrícola que obteve a pasta reorganizada do último ministério?
9. Na sua opinião, quais foram as principais contribuições e desapontamentos durante o período político mais favorável a agricultura familiar entre 2003 e 2015?
10. Quais são os principais problemas da agricultura familiar hoje?
11. Você pode oferecer uma ideia aos agricultores familiares para aumentar a renda da agricultura orgânica? (Ex. Uma ideia sobre como resolver os problemas que você apontou anteriormente)

12. Em sua opinião, quão vulnerável à agricultura familiar é a retirada das estruturas institucionais federais que apoiam o setor?
13. Como você vê o futuro da agricultura familiar?

Questionário 3 - Perguntas feitas aos atores diretamente envolvidos (artesãos, agricultores familiares)

Perguntas sobre as condições atuais da Economia Social e Solidária - SSE no Brasil

1. O que você entende por SSE e por que você pratica?
2. Quais são os principais desafios que você enfrenta em seu projeto e atividade econômica?
3. Você tem acesso a políticas de suporte para desenvolver seu projeto em SSE? Que tipo de apoio você precisa? Você recebe apoio de instituições atualmente?
4. Quais são as principais limitações para o sucesso ou desenvolvimento da sua iniciativa?
5. Qual é a importância do acesso ao apoio governamental à SSE na sua experiência?
6. Você tem uma base de apoio, seja institucional ou informal, um lugar ou um grupo de pessoas que você pode obter apoio solidário para o seu projeto ou necessidades pessoais?
7. Como uma pesquisa científica poderia contribuir para o desenvolvimento da ESS? Quais questões de pesquisas deveriam ser incluídas? Qual seria a utilidade dos resultados de tal pesquisas para a sua experiência?

Questionário 3 – Continuação: Perguntas sobre Agricultura Familiar no Brasil

8. Você pode comparar o extinto MDA com a nova Secretaria Especial de Agricultura Familiar e Desenvolvimento Agrícola que obteve a carteira reorganizada do último ministério ligado sob a Casa Civil?
9. Na sua opinião, quais foram as principais contribuições e desapontamentos durante o período político mais favorável a agricultura familiar entre 2003 e 2015?
10. Quais são os principais problemas da agricultura familiar hoje?
11. Você pode oferecer uma ideia a outros agricultores familiares sobre experiências que trouxeram melhoras para problemas comuns enfrentados pelo setor? (Ex. Uma ideia sobre como resolver os problemas que você apontou anteriormente)
12. Em sua opinião, quão vulnerável à agricultura familiar é a retirada das estruturas institucionais federais que apoiam o setor?

13. Como você vê o futuro da agricultura familiar?

Appendix E: Research-Creation initial proposal and fieldwork templates – English translation

To seek a scientific process that may be more relevant to communities and their environment, inclusive research approaches were explored. A simple strategic way to reduce risks and increase the probability of producing positive effects for the population involved is to include research participants in the research design process, especially when working with minority or disadvantaged groups. Thus, the approach proposed in this study is to use the Participatory Action Research - PAR processes in the research design and during fieldwork and analysis.

PAR involves collective processes of planning and implementation, which are intended to understand a group of people and change their livelihoods. It is generally seen as an effective approach to changing desired conditions in groups as, firstly, it works in continuous cycles. If the first attempt does not produce the expected results, the group can reflect and reshape the plan and actions until the desired changes are achieved. Second, it is a collective process in which the researcher and the population involved cooperate. Essentially PAR is composed of four collective processes, first is to map the issues and plan actions to change conditions. The second is to implement actions for the change. The third is to measure and analyze the effects, then reflect on the approach, and restart the cycle according to what has been decided.

1. Preliminary research

Objectives - Understand the local context and the experience of the actors that make up family farming and SSE to design a PAR aimed at a specific group of family farmers who practice SSE.

Context:

The SSE in the State of RN and in Brazil

Mapping of the main issues in the area of SSE and Family Agriculture

Mapping ideas or solutions to combat problems

Mapping of common goals

Approaching groups/communities that work with family farming in Northeast Brazil.

Identify potential collaborators to form the investigation team during the second phase

2. Secondary portion

Objective - Better understanding of the researched context to imagine strategies to change the living conditions of its participants.

The questions and objectives will be defined with the team and the group involved after analyzing the results of the preliminary research.

3. Fieldwork

The first step involves the invitation and application of a survey with a semi-random population that will be directed to specific groups of people identified as groups of interest in these areas. There will be two focuses: social and solidarity economy - SSE and family farming. After considering the short contextualization paragraph on the themes, respondents can respond freely, including disagreeing or not with the description offered for each theme. The questionnaires were designed as oral interviews to be recorded in digital audio.

Instructions and information for fieldwork

The first step is the invitation, establishment of agreements and the reading and signing of the informed consent form. The researcher introduces the survey and provides the form to the respondent.

The interview format was thought of as informal or casual conversation. The interviewer has the role of facilitator and moderator of the conversation. For example, the interviewer should attempt to cultivate punctual answers and keep the conversation concise so that the interview does not get too long. However, it is important to maintain a sufficient period for open responses. The target time for each interview is 30 to 40 minutes.

Participants' suggestions for creating relevant survey questions can be added to the survey and will be recorded to compose the secondary portion of the research. Suggestions on targeting and research questions will also be recorded for consideration.

GOALS

Time target: 30 to 40 min per interview

Number of interviews: 20 – 30 interviews

Whereas 10 to 20 interviews must be carried out with actors directly involved, ex. farmers (Questionnaire 3), the second priority is for interviewing community development or solidarity economy agents (Questionnaire 2). The smallest priority of interviews will be conducted with activists, economists, politicians or academics (Questionnaire 1).

Each interest group will have a script of questions:

Survey 1 - aimed at activists, economists, politicians, or academics.

Survey 2 - to be answered by community development or solidarity economy agents (e.g. AACC staff).

Survey 3 - Questions to be asked to the actors directly involved (artisans, family farmers, SSE entrepreneurs) (e.g. members of the Xique-Xique Network)

Demographic data to be recorded voluntarily:

- City
- Age
- Ethnicity
- Gender Identity
- Occupation

Questionnaire 1 - aimed at activists, economists, politicians, or academics
Questions about SSE in Brazil

1. Which institutions support the SSE social solidarity economy?
2. Which institutions benefited from the SSE between 1992 and 2002? Indicate the name of the institutions and what was their main role.
3. Which institutions benefited from the SSE between 2003 and 2016? Indicate the name of the institutions and what was their main role.
4. Can you compare the SSE in Brazil today with the SSE during PT governments? In terms of institutional infrastructure and budget?
5. Can you cite and disclose the main role of entities/institutions and whether the change in government direction has affected their actions?
6. Can you also talk about how changes in the (extinct) Ministry of Culture affected the SSE?
7. What is the importance of institutional spaces to support the Social and Solidarity Economy – SSE?
8. How would you describe the development of SSE in micro-regions and localities in Brazil?
9. What are the main obstacles to the development of SSE?
10. What are SSE's main vulnerabilities to withdrawal from institutional structures at the federal level? Analyze industry resilience.
11. During the favourable political period, do you think that sufficient autonomous structures were created that lessened the dependence of the SSE on government support policies?

Questionnaire 1 – continuation of the survey with questions about Family Farming

12. Can you talk about the Ministry of Agrarian Development MDA? What was its role?
13. Can you compare the extinct MDA with the new Special Secretariat for Family Agriculture and Agricultural Development that obtained the reorganized portfolio of the last ministry linked under the Civil House?
14. In your opinion, what were the main contributions and disappointments during the political period most favourable to family farming between 2003 and 2015?
15. What are the main issues facing family farming today?
16. Can you offer family farmers an idea to increase income from organic farming? (Ex. An idea on how to solve the problems you pointed out earlier)

17. In your opinion, how vulnerable is family farming to the withdrawal of federal institutional structures that support the sector?

18. How do you see the future of family farming?

Questionnaire 2 - answered by community development agents

Questions about current SSE conditions in Brazil

1. Compare SSE support between two recent political periods, the first of 1992-2002, the second of 2003-2016?

2. What is the importance of institutional spaces to support the SSE in its role as an agent for the development of rural communities?

3. Do you see the development of SSE in micro-regions and localities in Brazil?

4. What are the main obstacles to SSE development that affect the support offered by your development agency?

5. During the favourable political period, do you think that autonomous structures were created that reduced the dependence of the SSE on governmental policies?

6. In your view, what are the biggest challenges for ESS in the current contingent?

7. How could scientific research contribute to the development of SSE? What research questions should be included? How useful would the results of such surveys be to your experience?

Questionnaire 2 - Continuation: questions about Family Farming in Brazil

8. Compare the actions of the extinct MDA with that of the new Special Secretariat for Family Agriculture and Agricultural Development that obtained the reorganized portfolio of the last ministry?

9. In your opinion, what were the main contributions and disappointments during the political period most favourable to family farming between 2003 and 2015?

10. What are the main problems facing family farming today?

11. Can you offer an idea to family farmers to increase income from organic farming? (Ex. An idea on how to solve the problems you pointed out earlier)

12. In your opinion, how vulnerable is family farming to the withdrawal of federal institutional structures that support the sector?

13. How do you see the future of family farming?

Questionnaire 3 - Questions asked to the actors directly involved (craftsmen, family farmers)

Questions about the current conditions of the SSE in Brazil

1. What do you understand by SSE, and why do you practice it?
2. What are the main challenges you face in your project and economic activities?
3. Do you have access to support policies to develop your project in SSE? What kind of support do you need? Do you currently receive support from any institutions?
4. What are the main limitations to the success or development of your initiative?
5. How important is access to government support for SSE in your experience?
6. Do you have a support base, whether institutional or informal, a place or a group of people where you can get support for your project or personal needs?
7. How could scientific research contribute to the development of SSE? What research questions should be included? How useful would the results of such surveys be to your experience?

Questionnaire 3 – Continuation: Questions about Family Farming in Brazil

8. Can you compare the extinct MDA with the new Special Secretariat for Family Agriculture and Agricultural Development?
9. In your opinion, what were the main contributions and disappointments during the political period most favourable to family farming between 2003 and 2015?
10. What are the main problems facing family farming today?
11. Can you offer an idea to other family farmers about personal experiences that have brought improvements to common problems faced by the sector? (Ex. An idea on how to solve the problems you pointed out earlier)
12. In your opinion, how vulnerable is family farming to the withdrawal of federal institutional structures that support the sector?
13. How do you see the future of family farming?