Participatory Planning in the Brazilian Cerrado: Mainstreaming land use, climate adaptation, and vulnerability in the state-led program City for Us

Euripedes De Oliveira

Follow this and additional works at: https://scholarworks.umass.edu/dissertations_2

Part of the Environmental Policy Commons, Indigenous Education Commons, Infrastructure Commons, Latin American Studies Commons, Public Policy Commons, Social Policy Commons, and the Urban Studies Commons

Recommended Citation
De Oliveira, Euripedes, "Participatory Planning in the Brazilian Cerrado: Mainstreaming land use, climate adaptation, and vulnerability in the state-led program City for Us" (2017). Doctoral Dissertations. 965. https://scholarworks.umass.edu/dissertations_2/965

This Open Access Dissertation is brought to you for free and open access by the Dissertations and Theses at ScholarWorks@UMass Amherst. It has been accepted for inclusion in Doctoral Dissertations by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.
PARTICIPATORY PLANNING IN THE BRAZILIAN CERRADO: MAINSTREAMING LAND-USE, CLIMATE ADAPTATION, AND VULNERABILITY, IN THE STATE-LED PROGRAM CITY FOR US

A Dissertation Presented

by

EURIPEDES DE OLIVEIRA

Submitted to the Graduate School of the University of Massachusetts Amherst in partial fulfillment of requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2017

Regional Planning
PARTICIPATORY PLANNING IN THE BRAZILIAN CERRADO: MAINSTREAMING LAND-USE, CLIMATE ADAPTATION, AND VULNERABILITY, IN THE STATE-LED PROGRAM CITY FOR US

A Dissertation Presented
by
EURIPÉDES DE OLIVEIRA

Approved as to style and content by:

Elisabeth Hamin, chair

Sally Campbell Galman

Mark Hamin

Robert Ryan, Acting Chair
Landscape Architecture and Regional Planning
DEDICATION

In memory to my father Euripedes Borges de Oliveira, the elder of eleven children who quit school when in his third grade to help my grandparents raise his siblings. In memory of my mother Cleusa Silva de Oliveira, a public-school teacher who mothered seven children and liked knowing new places. In memory to my “dindinha” Dilce de Oliveira who taught me to persevere in my quest, and to do it right even when it takes a little longer to achieve. Thank you to my siblings.

Here, I express my deepest gratitude and appreciation to my loving spouse Larry Hunt – the gift from heaven. Thank for your company, support, and encouragement, through this project when the go was challenging.

To my dear friends, Maria Jose and Claude Hulet, and Michael Popwell, whom made part of my earlier move into academia. Lastly, but not least, thank you Sandra Ann McMurray for your comforting spirituality.
ACKNOWLEDGMENTS

I want to thank my dissertation committee shared by Drs. Elisabeth Hamin, Sally C. Gallman, and Mark Hamin, from who I learned from their teaching and academic ethics. I would like to thank my advisor and committee chair Elisabeth M. Hamin, who introduced me to the subject of my dissertation. Her many years of support, and thoughtful and patient guidance were priceless through the build up of my own research paradigm.

My gratitude is also extended to Drs. Rob Kent and Tim Dagodag, whose friendship and contribution to my professional development have been invaluable and will forever be appreciated.

I want to thank the Secretary of the Cities of the State of Goiás, Brazil. A special acknowledgement to the Superintendent of Urban Programs Silmara Vieira, and the coordination, field technicians, and participants, of the program City for Us, who collaborated with my investigation, whenever sharing their thoughts, experiences, concerns, expectations, and laughs, through the interviews and off record conversations. Your interest on the findings of my research was quite inspiring, and so I owe you a Portuguese version of the dissertation.
ABSTRACT

PARTICIPTORY PLANNING IN THE BRAZILIAN CERRADO: MAINSTREAMING LAND-USE, CLIMATE ADAPTATION, AND VULNERABILITY, IN THE STATE-LED PROGRAM “CITY FOR US”

MAY 2017

EURIPIDES DE OLIVEIRA, B.A., CA STATE UNIVERSITY NORTHRIDGE M.A., UNIVERSITY OF CALIFORNIA LOS ANGELES PhD, UNIVERSITY OF MASSACHUSETTS AMHERST

Direct by: Professor Elisabeth M. Hamin

The research highlights the urgency of communicating information about climate change, and to seeks to advance generalized knowledge about alternatives to mainstreaming land-use, climate adaptation, and vulnerability in participatory planning processes. It examines the state-led community-based planning process under the program City for Us (2005-2007), that took place in the state of Goiás, Brazil. My leading argument contemplates that vulnerability assessments developed through community-based planning processes might pave the way to further mainstreaming climate change adaptation in planning processes. The research investigates whether the planning process integrates vulnerability in the land-use discussion by the participants of the program. This research aimed to answer the question “How do land-use practices discussed in City for Us participatory planning processes relate to vulnerability, and what does this mean for how vulnerability can be relevant in other participatory planning.”

The arguments for adaptation in this research are advanced through the lens of the social sciences, wherein the element vulnerability considers processes, practices, and governance-inequity issues. I investigate the vulnerability of human systems, which have
experienced some sort of climate and or non-climate stress with limited capacity to cope or adapt. The vulnerability framework guiding the investigation encompasses the “architecture of entitlements” and “pressure and release” traditions in the climate change adaptation literature, which better suit the focus of the investigation than the “sustainable livelihood” and “socio-ecological” traditions.

The exploratory design used in the research advances the qualitative paradigm that guides the ontology, epistemology, and methodology of my investigation, which is in unison with the constructionist perspective in the climate change adaptation literature that vulnerability is socially constructed. The analytical process combines an adapted constant comparative analysis, and a theoretical framework of vulnerability. Data collection methods include semi-structured interviews with purposely selected respondents that represented cities within the Goiânia Metropolitan Region while participants of the program City for Us. Journaling, field notes, and memos were also used. Triangulation materials are drawn from Brazilian’s national and state surveys, database, and archives including toolkits and publications used through the implementation of the program City for Us.

The research found that vulnerability assessments developed through participatory planning processes facilitate further mainstreaming climate change adaptation, wherein policy makers and planners introduce more robust climate-related measures in further planning revisions. Research limitations concerned time and budget, accessibility to and availability of respondents, unintended pre-conceived theoretical frameworks, and the researcher’s positionality and roles. The research improves methodological frameworks for development of and revision of master plans, development policies, and development
of capacity building initiatives that engages policy makers, managers and planning professionals, and the community at large in the advancement of climate adaptation.

Key words: vulnerability, land-use, participatory planning, Cerrado.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>acknowledgements</th>
<th>v</th>
</tr>
</thead>
<tbody>
<tr>
<td>abstract</td>
<td>vi</td>
</tr>
<tr>
<td>chapter</td>
<td></td>
</tr>
<tr>
<td>1. introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.1 research question</td>
<td>5</td>
</tr>
<tr>
<td>1.2 case study: the program city for us</td>
<td>6</td>
</tr>
<tr>
<td>1.3 implications of the research findings</td>
<td>8</td>
</tr>
<tr>
<td>1.4 research limitations</td>
<td>10</td>
</tr>
<tr>
<td>2. substantive literature review</td>
<td>13</td>
</tr>
<tr>
<td>2.1 the various interpretations of adaptation and vulnerability</td>
<td>14</td>
</tr>
<tr>
<td>2.1.1 climate change adaptation in perspective</td>
<td>14</td>
</tr>
<tr>
<td>2.1.2 adaptative capacity and coping with uncertainties</td>
<td>17</td>
</tr>
<tr>
<td>2.1.3 the vulnerability paradigm of multiple interpretations</td>
<td>19</td>
</tr>
<tr>
<td>2.1.4 the “biophysical-social” resilience domain of vulnerability</td>
<td>21</td>
</tr>
<tr>
<td>2.1.5 applicability to the dissertation</td>
<td>24</td>
</tr>
<tr>
<td>2.2 mainstreaming multisectoral and value-based adaptation</td>
<td>25</td>
</tr>
<tr>
<td>2.2.1 social vulnerability: multisectoral adaptation and the shift from biophysical to social processes</td>
<td>25</td>
</tr>
<tr>
<td>2.2.2 mainstreaming adaptation through developmental initiatives</td>
<td>29</td>
</tr>
<tr>
<td>2.2.3 community-based adaptation and valuable indigenous knowledge</td>
<td>33</td>
</tr>
<tr>
<td>2.2.4 applicability to the dissertation</td>
<td>36</td>
</tr>
<tr>
<td>2.3 global processes, urban expansion, and climate inequity issues</td>
<td>38</td>
</tr>
<tr>
<td>2.3.1 urban expansion, sustainability, and the climate and non-climatic vulnerability resulting from changes in land-use and cover</td>
<td>38</td>
</tr>
<tr>
<td>2.3.2 global processes, urban expansion and inequity issues within climate and non-climatic vulnerability</td>
<td>41</td>
</tr>
<tr>
<td>2.3.3 applicability to the dissertation</td>
<td>44</td>
</tr>
<tr>
<td>3. research design</td>
<td>46</td>
</tr>
<tr>
<td>3.1 the qualitative paradigm</td>
<td>47</td>
</tr>
<tr>
<td>3.1.2 the conceptual framework</td>
<td>49</td>
</tr>
</tbody>
</table>
3.1.3 The Adapted Constant Comparative Method (CCM) ................................................. 50
3.2 Building Rapport: Positionality, Roles and Ethics.................................................. 52
3.3 Integrating Qualitative and Quantitative Data ....................................................... 57
   3.3.1 Data Collection Approaches ............................................................................. 58
   3.3.2 Data Management ............................................................................................ 60
   3.3.3 The respondents .............................................................................................. 64
3.4 Research Credibility ............................................................................................... 66
3.5 Applying the adopted CCM coding techniques ...................................................... 68
   3.5.1 The Participatory Planning, Land-Use, and Vulnerability Data Segments ......... 68
   3.5.2. Data Coding and Analysis ............................................................................. 70
4. RESEARCH FINDINGS ................................................................................................. 77
4.1 The Democratic Experience, and the Learning and Mobilization Capacity in the Program
City for Us .................................................................................................................. 78
   4.1.1 Participation through Involvement and further Engagement ......................... 79
   4.1.2 Capacity Building Workshops ....................................................................... 81
4.2 Mobilization Capacity Gradient .............................................................................. 85
   4.2.1 Mobilization through Persuasive Rational-Ideological Argumentation .......... 86
   4.2.2 Empowering Mobilization .......................................................................... 87
   4.2.3 Mobilization through Reflexivity ................................................................... 89
   4.2.4 Mobilization Capacity Gradient ................................................................... 91
4.3 Learning Experience ................................................................................................. 92
   4.3.1 Pedagogy ......................................................................................................... 92
   4.3.2 Learning .......................................................................................................... 93
   4.3.3 Learning Capacity Gradient ......................................................................... 95
4.4 Governance, Equity, and Sustainability Perspectives within Participatory Planning
Processes ..................................................................................................................... 96
   4.4.1 Participatory Land-Use Assessment ................................................................. 96
   4.4.2 Distributional Issues from Land-Use Policies ................................................... 97
4.5 Indigenous Groups’ Experiences Inform Planners and Policy Makers About Climate
and Non-Climate Vulnerability .................................................................................. 102
   4.5.1 Layperson’s Understanding of Socioeconomic and Environmental Vulnerability... 103
   4.5.2 Vulnerability to Climate Variability ................................................................. 105
   4.5.3 The Social Vulnerability Perspective on Housing ......................................... 106
   4.5.4 Vulnerability to Political Constraints ............................................................... 109
4.5.5 Coping Strategies to Overcome Political Constraints ........................................ 110

5. DISCUSSION OF THE RESEARCH FINDINGS .......................................................... 112

5.1 The Democratic Experience, Critical Learning, and Mobilization Capacity, Paramount to Participatory Planning Processes ................................................................. 113

5.2 Linking Urban Expansion, Sustainability, and Climate and Non-Climatic Vulnerabilities .................................................................................................................. 115

5.3 Program City for Us: The Underlying Vulnerability Element built into the Planning Process, and Land-Use Policies and Practices ......................................................... 117

5.3.1 Responding to Political Constraints in Planning Processes ............................... 118

5.3.2 Uncertainty, Resilience, and Non-Climate Vulnerability in the Participatory Planning Process .............................................................................................................. 120

5.4 The Relevance of Vulnerability to other Participatory Planning Endeavors .......... 122

5.4.1 The Community-Based Land-Use Assessment .................................................... 122

5.4.2 Mainstreaming Climate Adaptation in Community-Based Planning ............... 125

6. CONCLUSION ........................................................................................................... 130

BIBLIOGRAPHY ........................................................................................................ 134
<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Data Inventory</td>
<td>61</td>
</tr>
<tr>
<td>2. Planning Priorities</td>
<td>99</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. El Nino Southern Oscillation (ENSO) in LAC</td>
<td>2</td>
</tr>
<tr>
<td>2. The Biome Cerrado (1997-1998)</td>
<td>2</td>
</tr>
<tr>
<td>3. Program City for Us Workshop held in Fall 2006</td>
<td>8</td>
</tr>
<tr>
<td>4. Nested Hierarchy Model of Vulnerability</td>
<td>17</td>
</tr>
<tr>
<td>5. Adapted Constant Comparison Method</td>
<td>51</td>
</tr>
<tr>
<td>6. Informed Consent</td>
<td>56</td>
</tr>
<tr>
<td>7. Goiânia Metropolitan Region</td>
<td>63</td>
</tr>
<tr>
<td>8. Meia Ponte River Watershed</td>
<td>63</td>
</tr>
<tr>
<td>9. Meia Ponte, Parana, and Prata Basins</td>
<td>64</td>
</tr>
</tbody>
</table>
“We (...) must never provide the people with programs which have little or nothing to do with their own preoccupation, doubts, hopes, and fears – programs which at times in fact increase the fears of the oppressed consciousness.” (Freire, Paulo (1970), The Pedagogy of the Oppressed, Myra B. Ramos (trans.), 2005, Continuum, NY, p. 96, pp 183)

CHAPTER 1

INTRODUCTION

The combined impact of anthropogenic climate change with climate variability increases the vulnerability of human and natural systems and their exposure to extreme events in South America. A case in point, as shown in figure 1, the 1997-1998 El Niño Southern Oscillation (ENSO) increased the temperature in the Pacific Ocean to its highest until 2005 causing severe droughts, high temperatures and increased forest fires in the region which includes areas from the Brazilian savannah known as the biome Cerrado (IPCC WG1 AR4). As indicated in figure 2 the Cerrado is the predominant landscape in Brazil’s mid-western states, and covers approximately 25% of the national mass land (IBGE Brazil, 2004). It has experienced significant inflow of foreign and international capital and technology leading to fast pace urbanization, population growth, and rapid change of land-uses (Sawyer, 2008; Carvalho et al, 2009) and land cover in the past four decades. This development pathway in the Brazilian mid-western states is compromising watersheds, increasing GHG emissions and soil erosion that is depleting the biome (IBGE, 2004). The Cerrado is a world hotspot of biodiversity, it is the second largest biome in South America, and covers 22% of the Brazilian land mass (MOMA Brazil, 2013). The atmospheric impact of ENSO on Latin America is shown on the map to the
right of figure 1, and the mass land covered by the biome Cerrado is shown on the map to the right.

Figure 1: El Niño Southern Oscillation (ENSO) in LAC
Figure 2: The biome Cerrado (1997-1998)

The dissertation investigates the participatory planning process under the state-led program Cidade pra Gente (City for Us). The program was implemented in year?? by the Secretaria das Cidade de Goiás (Secretary of Cities of Goiás State), which was responsible for the advancement of the state’s regional and urban development policies. The program was among various state–led community-based planning programs implemented in all states by their respective state administrations. These programs advanced the national urban development policies, which was aligned with the federal law Statute of the City enacted in 2001. Its guiding principle concerns the social function of the city, to be carried by the master plans, wherein the urban land shall serve the collective interest. The Statute set the parameters for the decentralization of urban policy making to the municipalities, in that local master plans are an instrument to advance policies for development, city growth, and urban expansion (Ministry of the Cities,
2001). The Working Groups who implemented the program were required to develop master plans for their city, which then were implemented through a political process. From the period of 2001-2009 the number of Brazilian municipalities that had master plans increased from 805 to 2,318, and by 2009 about 87% of the 1,563 municipalities required by the Statute of the City to have master plans, had their plans enacted as municipal law (BR Ministry of the Cities/ Observatório das Metrópoles, 2011). These state-led programs, including the program City for Us, shift stakeholders’ land-use, planning, and development paradigm.

The dissertation makes references to participatory planning and land-use undertaken by a selected number of the participants of the program City for Us, wherein it concerns processes, practices and governance-equity issues. It looks at the participants’ understanding of how socio-economic and institutional forces influenced the planning process they experienced, the way land-use practices were discussed in the program, and how that links to vulnerability where it concerns their exposure to risk and hazard impact. For purposes, here, risk concerns the probability and magnitude of hazard. Hazard embodies the biophysical manifestation of climate and non-climatic events, and vulnerability (of human systems) takes in consideration both the vulnerability within a human system, and the biophysical environment related to this system (Brooks, 2003). The institutional context encompasses formal political structures and their social and cultural stands (Kelly and Adger, 2000; Adger et al, 2004).

The social vulnerability literature cited in the dissertation advances the integrated approach of adaptation to climate variability and change, defined as the use of community-based strategies to develop vulnerability studies and assessments, while
mainstreaming adaptation measures into developmental and or planning initiatives (Adger et al, 2004; Smit and Wandel, 2006; Wisner et al, 2003; Blaikie et al, 1994). The theoretical framework of the research includes the “architecture of entitlements” and “pressure and release” traditions (Kelly and Adger, 2000; Adger et al, 2004; Adger, 2006; Brooks, 2003; Handmer, 2003; Moench, 2007; Smit and Wandel, 2006; Wisner et al, 2003; Blaikie et al, 1994).

The “architecture of entitlements” tradition explains vulnerability as the lack of entitlements of individuals and groups that lead to food insecurity, and wherein the well-being of humans is conditioned to the propensity of their livelihood being impacted by climate and non-climatic events (Adger, 2006). More often than not entitlement studies reflect the social elements of institutions, where social status and gender are variables of wellbeing, where the natural hazards tradition presents vulnerability through the geographical and psychological lenses. Here, Adger (2006) explains that the knowledge of environmental risks along with the human response to hazards is essential. The “pressure and release” vulnerability research considers both the arguments from the natural hazard tradition (Adger, 2006 cites Burton et al, 1993), and from the vulnerability tradition that explains hazard vulnerability through the lenses of the political economy, which is rooted in class structure, governance, and economic dependency (Adger, 2006 cites Hewitt, 1983). The author explains that “pressure and release” suggest two pressures -- the biophysical hazard inherent to vulnerability, and the pressure from increasing vulnerability based on geographic location and social differentiation (Adger, 2006).
Researchers are pragmatics and combine various techniques to reach a desired outcome (Crotty, 1998; Crowford, 2000). The exploratory design of this research advances the qualitative paradigm (Lincoln and Guba, 1985; Denzin and Lincoln, 2003). It takes a constructionist viewpoint in arguing that the climate change vulnerability is socially constructed (sources). Data collection methods include semi-structured interviews, journaling, field notes, and memos. Triangulation uses data drawn from national and state surveys, database, archive, and toolkits and publications used to guide the participants of the program City for Us through the elaboration of their cities’ master plans. The purpose of my research is driven by the instrumental (Rossman and Rallis, 2003; Rossman and Rallins, 2012 cites Patton, 1997; Creswell, 2007) purpose of my findings, which entails the development of a methodological framework to address vulnerability to climate variability and change in planning processes, and master plan revisions.

1.1 Research Question

The research aims to answer the question “How do land-use practices discussed in participatory planning process relate to vulnerability, and what does this mean for how vulnerability can be relevant in other participatory planning? The thesis statement considers that community-based planning processes involve stakeholders in proactive discussion of vulnerability through the making of land-use policies, which once implemented may reduce stakeholders’ vulnerabilities to risk and hazard. Following on that line the thesis contemplates that community-based vulnerability assessments can
become a systematic part of participatory planning endeavors to advance climate change adaptation.

1.2 Case Study: The Program City for Us

The case study is the community-based program City for Us. The program sought to strengthen city management and administration state wide, through the development, revision, or assessment of existing master plans. These master plans advanced local urban development policies. The program ran from 2005 through 2008, and engaged approximately 1,100 stakeholders from 88 municipalities in a participatory planning process, to develop the master plans for these municipalities (Secretary of Cities of Goiás State, 2009). These municipalities were represented by community workgroups (WG’s) enacted through municipal decrees. The methodology used in the program City for Us included a series of capacity building workshops and public hearings, while integrating a range of stakeholders from all types of walk. Funding and institutional support were provided in different ways by the federal, state, and municipal branches of government associated to the program City for Us, yet the role of the Secretaria das Cidade de Goiás was determinant for the success of the program. As per the Secretary of Cities of Goiás State (2008) 70 municipalities state-wide that participated in the program City for Us were required by the Statute of the City to have master plans.

Master plans were not required for cities with less than 20 thousand inhabitants, or were not within metropolitan areas, areas designed for tourism or designated historic preservation, and areas that house industries and or any activity that has environmental impact at local, regional and national scales. By the end of the program 36 of these
municipalities had their master plans enacted as municipal law, 11 had their plans reviewed by their city councils but had not been enacted yet, and 16 were developing their master plans. An additional 9 municipalities, which did not fit in the city profile required to have master plans, had their plans under development.

The program was implemented in three phases, which entailed a series of capacity building workshops that engaged engaging simultaneously all participants into a process of learning while doing. In the first phase, named “Reading the Municipal Reality”, the WG’s developed an inventory of the cities they represented in the program. Under the guidance and technical support of federal, state, and municipal agencies and planning related professionals, the WG’s assessed the reality and potentialities of their municipalities (participatory mapping). They advanced a participatory city inventory while assessing current urban and rural infrastructure, social services, city governance and budget, and local economic strength and potentiality. Thus, they collected, read and discussed their findings, acknowledged and discussed their institutional, social, economic, environmental and cultural weaknesses, strengths, and potentialities. In the two subsequent phases the WG’s established short and long term goals and wrote their cities’ master plans under the umbrella of sustainable urban development. The master plan’s land-use policies aim for sustainability through socio-economic development, conservation and equity. The hands-on approach to planning experienced by the WG’s is illustrated by figure 2, which shows three capacity building activities held monthly in Goiânia, the state capital. The larger photography to the left shows the opening of the workshop, wherein a mix panel of academics, professionals, and public representatives introduced the theme underlying the purpose of and end-product (s) aimed for the
weekend workshop. This activity was also used to present a general assessment and overall achievements of the program City for Us at large. The assessments were further discussed in a work group (WG) basis, where they shared their end products, and learned from each other’s experience. The smaller photograph on the top shows workshop session in which WG’s worked directly with the field, and the photography below WG’s share their work with other WG’s.

Figure 3: Program City for Us Workshop held in Fall 2006

1.3 Implications of the Research Findings

Brazil is an emerging economy that has attracted the attention of the international research community and organizations. Although climate change is a recent research theme in the country, the national and international communities are advancing climate change research concerning the Amazon basin, and to some extent the Brazilian northeast and the coastal areas. My research brings the attention of the international community to the impact of climate change on the Brazilian mid-western states and the Brazilian biome Cerrado. The research findings can contribute to a better understanding for researchers, professionals, and indigenous groups, of how communities may perceive community-
based planning, land-use, and vulnerability to climate and non-climatic events, and also contribute to their understanding of mainstreaming climate related measures in the development or revisions of master plans in meaningful ways to residents.

The research may be an initial step to identify climate change related principles that underlie community-based perspectives, and its wide-ranging outcome can be a policy that better links urban expansion and vulnerability in ways that are meaningful to local residents and decision-makers. The investigation has an instrumental purpose (Rossman and Rallis, 2003; Rossman and Rallins, 2003 cites Patton, 1997; Creswell, 2007), which means that I had plans to use my findings prior to the research designing and fieldwork. With that purpose, my findings can contribute to methodological frameworks for development of master plans revision, development policies, and capacity building initiatives engaging policy makers, city managers and planning professionals, community leaders and the general public in the climate change adaptation.

The findings of the research can build on and contribute to various subject areas. For instance, the interdisciplinary element inherent to the adaptation-vulnerability guiding my research concerns the climate and non-climatic studies, advanced by various fields in the natural and social sciences. Whether the findings of the research are sufficient to support my thesis statement and answer the research question, the overall investigation process, including the engagement of laypersons through the interviews, can contribute to the dissemination of and the communication of climate change. In fact, no matter the extension of the applicability of the findings it will have an “enlightenment use”, since it can contribute to a more pro-active knowledge and understanding (Rossman and Rallis, 2003) of climate change adaptation.
1.4 Research Limitations

The very reason leading me to advance an exploratory qualitative research, linking community-based planning processes and climate change adaptation, can also be a limitation for my research. The phenomenon that I investigated is an unexplored planning process that I want to understand through the combination of both tacit and scientific knowledge, which relates respectively to layperson’s perspective and a theoretical framework. There is not much qualitative research about the climate change and regional planning interplay embedded in participatory planning processes, more specifically literature that explores this phenomenon within the context of global processes and patterns of urbanization in the state of Goiás, and so the Brazilian Cerrado. That left me with a limited research work on this exact topic that I can learn from when designing my research, from data collection and analysis through the research write-up. As a neophyte, my limited experience of working with qualitative methodologies was an initial constraint for me. That was managed as the research advanced through revisions of the qualitative research literature along frequent consultations with social scientists within and outside my dissertation committee, with doctorate fellows, and through the presentation of papers on the subject of my research in three conferences. The feedbacks from these paper presentations led me to make adjustments to the methodology used in my research.

I was exposed to the phenomenon under investigation back in 2006 during the implementation of the second phase (out of three) of the program City for Us while a spokesperson for my employer, at California State University Northridge. My purpose
was not to observe the planning process itself but to understand the program through its various structural components, from government funding through program implementation, prospective Brazilian cohorts and their demographics among others. The climate change subject was not on my radar. My objective back then was not to advance an observational research (Angrosino and Pérez, in Denzil and Lincoln, 2003) but to gain insights about the program, and use that to articulate and advance programmatic initiatives between the Secretary of the Cities of the State of Goiás (BR) and the extending learning program ran by my employer. Based on these considerations, in the context of my PhD research I present myself as a researcher that was exposed to the phenomenon under investigation, which is something that the qualitative literature suggests being beneficial to the research – one of the tenets of epistemology. Where it concerns my familiarity with the respondents from my interviews, it was limited to the two program coordinators, and to a lesser extent to the project manager and two field technicians that I interviewed. Although I was exposed to the program City for Us, I did not know the remaining 14 respondents prior to this research.

All respondents received inquiries about their experiences in the program City for Us, which took place from 2005 through 2008. Some participants were concerned that since their participation in the program occurred about five years prior the interview (2013) they would not remember everything they experienced. In hindsight, for some respondents such concern along with their unfamiliarity with the climate change subject could be intimidating. I disclosed to the respondents that the fact that they were re-interpreting their experience, and or their unfamiliarity with climate change would not diminish the factual relevance of the information they were providing through their
interviews. Triangulation with second source data and using negative cases are relevant
to address this matter. For the aforementioned reasons, I do not perceive their re-
interpretation as a defining limitation since it is aligned with the qualitative paradigm
guiding the methodology and method of inquiry that I used, and because of the
instrumental perspectives of the application of the research findings.

Limited budget and time imposed constraints on the scale of the project. To
address such limitations, I attempted to maximize the differences among the
interviewees, and used a theoretical framework throughout the analytical process that
followed. The pool of interviewees included two program coordinators, one program
manager, two field technicians who provided support to the community working groups
(WG’s), and 14 WG members from 6 different cities that participated in the program City
for Us. The heterogeneity amongst the interviewees relates to their roles in the
implementation of the program, gender, levels of education, household income, political
affiliations, if the respondents were urban or rural dwellers, and levels of exposure to risk
and hazardous impact caused by socio-economic uncertainties, and vulnerability to
climate variability and change.

Not less important in terms of limitation is the unintended influence of the pre-
conceived conceptual framework that could influence my positionality and roles during
the interviews, as well through the data analysis, thus, impacting the outcome of my
investigation. I further discuss these limitations and the remediation I used to address
them in the section that discusses the rapport building, my positionality, roles and ethical
considerations permeating my interaction with the respondents of my interviews, and
analysis through the research process.
CHAPTER 2

SUBSTANTIVE LITERATURE REVIEW

This chapter is presented in three sections. Section 1 introduces the different traditions on the adaptation and vulnerability scholarship, yet leaning toward the arguments used by the social sciences. This section discusses the implications of having various interpretations of adaptation and vulnerability. They hold singular meanings, and their applicability is conditioned to specific contexts. Adaptative capacity hold similarities with other concepts used in the climate change scholarship including coping ability. Both concepts are discussed in this section as well.

Section 2 discusses the multisectoral approach to adaptation advanced by the risk and hazard scholarship, which leads to the arguments for moving the emphasis from the risk itself to the causes leading to it, and from the biophysical to social processes. The chapter advances the argument for mainstreaming adaptation measures into existing developmental and planning initiatives, to decrease the vulnerability of local communities while increasing their adaptative capacity. The value-based adaptation literature follows with the arguments of pros and cons for the use of community-based approaches while assessing vulnerabilities, and developing and planning adaptation measures. Section 3 discusses the triggers and implications of urban expansion, where non-climatic changes such as demographic, socio-economic and technology may increase the vulnerability of human systems and the biome Cerrado. The arguments in here lean toward the discussion of social vulnerability of human systems, and its link to the decline of urban build-up density and population and urban growth which creates demand for serviced urban land, and forces the expansion of city limits. The former leads to
disproportional distribution of vulnerabilities, and of the impact from the implementation of adaptation measures.

### 2.1 The Various Interpretations of Adaptation and Vulnerability

#### 2.1.1 Climate Change Adaptation in Perspective

IPCC AR5 defines ‘*Mitigation*, in the context of climate change, is a human intervention to reduce the sources or enhance the sinks of greenhouse gases (GHGs).’ Mitigation measures themselves limit the extent of future damage and generally they aim to change the source of energy and its demand (Condon et al, 2009), but they do not address the adversities of climate change already underway in global climate systems (Pielke Jr, 1998; Condon et al, 2009; UN Habitat, 2011; Tanner and Allouche, 2011). Mitigation and adaptation measures (Pittock and Jones, 2000; Hamin and Gurran, 2008; IPCC A4; UN Habitat, 2011; IPCC AR4) are deeply intertwined (Pittock and Jones, 2000), because mitigation measures address current and future GHG while adaptation measures address the adjustments of both built and natural environments to climate change. However, they also may conflict with each other (Hamin and Gurran, 2008; UN Habitat, 2011). There has been a shift of focus of the international community to a more balanced approach that recognizes adaption priorities because of the pressing realities of populations and groups impacted by climate-related events (Tanner and Allouche, 2011).

The bibliography of adaptation (and vulnerability) carries an array of interrelated concepts from different fields including adaptation, vulnerability, sensitivity, adaptative capacity, risk, hazard, and these relationships are not so clear (Books, 2003, cites IPCC AR4; Adger et al, 2002; Burton et al, 2002; Smit et al, 2000; Smit and Wandel, 2006).
These concepts may suggest different meanings and applications accordingly to a given context, the author and or the area of study, whether in the social, or natural sciences (Books, 2003; Brooks et al, 2004; Füssel, 2010; Smit and Wandel, 2006. Smithers and Smit (2010) and Gidley et al (2009) suggest that the conceptual and analytical approaches to climate change adaptation continue evolving. For purpose of this dissertation climate change adaptation is a social process in which “the ability of societies to adapt is determined, in part, by the ability to act collaboratively” (Adger et al, 2003)

In his reconstruction of adaptation Burton (2009) suggests that the social and environmental dimensions are to be considered in the framework of climate change adaptation, and that both social and biological systems are adaptive to each other and so both can evolve. On a similar framework Adger (2006) supports the concept of social-ecological system since human actions and social structures are built into in the natural system. The climate change adaptation literature which include Burton (2009), Smithers and Smit (1997), Pittock and Jones (2000), Smit et al (2000), Smit and Wandel (2006), and Gidley (2009) suggest that the context determines the adaptation of human and natural systems to climate change and variability. They suggest that different contexts requires different adaptation measures, and for that reason climate change adaptation might be understood, conceptualized, and foreseen differently. Following on those lines Smit and Wandel (2006) point out the limited research on the implementation process of adaptation.

The community-based view of adaptation is supported by the differentiation of adaptation processes in which the design and selection of a specific adaptation measure is influenced by the circumstances under which it will be implemented, the levels of the
stakeholder’s participation (Smit et al, 2000; Smit and Wandel, 2006), representation and deliberation of such measure. Smit and Wandel (2006) propose the practical adaptation approach, which is a “bottom-up” scenario-based approach in which stakeholders make use of experience and knowledge to assess their community’s conditions and sensitivities, to develop and decide for strategies to increase the resilience of and probably their communities’ adaptative capacity (Smit and Wandel (2006). The authors call for more community-based studies in which the stakeholders engage in decision-making processes, wherein they exam the adaptability and e capacity needs of their community, and recognize ways to implement adaptation measures while improving the adaptative capacity of the community.

Smit and Wandel (2006) maintain that adaptation measures are embodied in the human and natural systems’ adaptability and capacity to reduce the vulnerability of these systems. Along those lines, Smit and Wandel (2006) use their “nested hierarchy model of vulnerability” to explain the interconnectivity between the processes of exposure, sensitivity and adaptative capacity of local human and natural systems in response to climate related risks and hazard impacts. The model is illustrated in figure 4, wherein Smit and Wendel (2006) suggests that local and broad regional, national, and global forces factor in these processes and their outcome stress. The exposure and sensitivity elements of vulnerability are the outcome of the interface of environmental and social drivers, while the adaptative capacity is driven by economic, social, cultural, and political factors (Smit and Wandel, 2006).
2.1.2 Adaptative Capacity and Coping with Uncertainties

Smit and Wandel (2006) cite Smithers and Smit, 1997; Adger and Kelly, 1999; Smit et al., 1999; Jones, 2001; Fraser et al., 2003; Tompkins and Adger, 2004; Brooks, 2003; Füssel and Klein, 2006, and pointed out to the similarity of adaptative capacity to the concepts adaptability, coping ability, management capacity, stability, robustness, flexibility, and resilience. Smith and Wandel (2006) explain that like adaptation it is context-specific, its driven forces are the factors that influence the capability of individuals and groups to adapt, and that some of these driven forces are local like kinship networks, while others are wide-ranging like socioeconomic and political forces. The authors maintain that at the local level the adaptative capacity can be influenced by such factors as *managerial ability, access to financial, technological and information resources, infrastructure, the institutional environment within which adaptations occur, political influence, kinship networks, among others etc.* (Smit and Wandel, 2006 cite Watts and Bohle, 1993; Hamdy et al., 1998; Adger, 1999; Handmer et al., 1999; Kelly
Key elements of adaptive capacity and the impact of extreme climatic and non-climatic thresholds can be identified through vulnerability assessments, and these elements can suggest the resilience of social-ecological systems (Adger, 2006). Adaptive capacity can be examined in different ways like through “coping ranges”, which are characterized by the situation wherein a system is able to deal with, accommodate, adapt to, and recover from (Smit and Wandel, 2006 cite de Loe and Kreutzwiser, 2000; Jones, 2001; Smit et al., 2000; Smit and Pilifosova, 2001, 2003). The flexibility of coping ranges allows them to respond to economic, social, political and institutional change in conditions over time. If in one hand population pressure or resource depletion can gradually reduce a system’s ability to cope and lean its coping range, on the other hand economic growth, or institutional and technological advancements can pave the way for surge in adaptive capacity (Smith and Wandel, 2006 cites deVries, 1985; Smit and Pilifosova, 2003; Folke et al., 2002)

Extreme events tend to occur with concurrent multiple stressors (Pittock and Jones, 2000; Blaikie et al, 1994) that impact the natural and socio-economic systems, thus, the impacts are complex, location-specific, unpredictable and uncertain to a global change spectrum (Pittock and Jones, 2000). The authors point that the uncertainty of future human behavior, such as GHG emissions, contributes greatly to climate change uncertainty. They suggest that uncertainty can be managed if assessments of potential climate change impacts are supported by sensitivity studies and risk analyses, and within a socio-economic context. In this context, various stressors and the capacity of the
systems to adapt to change are considered in the assessment of climate change impact and adaptation, and various thresholds for an array of impacts are to be established, and aesthetics, ecosystem and monetary values will define critical thresholds (Pittock and Jones, 2000). Individuals and groups can learn from prior experiences (Smit et al, 2000). A case in point the authors cite Magalhaes’ (1996) work in northwestern Brazil from which along the way he learned about the need for incorporating adaptation measures in regional development planning to increase the adaptative capacity of communities to cope or adapt to stresses. The former concerns mainstreaming adaptation that is further discussed in section 2.2.

2.1.3 The Vulnerability Paradigm of Multiple Interpretations

Füssel (2010) makes reference to the definition of climate change vulnerability among others to the work of Adger (1999), Kelly and Adger (2000), Brooks (2003), O’Brien et al (2004), Füssel (2007), and O’Biren et al (2007). As it concerns to the determinants of vulnerability Füssel (2010) suggests among others Chambers’ (2009), Sánchez-Rodriguez’ (2002), and Pielke Sr. and Guenni’s (2003) “internal and external” arguments for dimensions of vulnerability, and Brook’s (2003) and Füssel’s (2007) “biophysical and social” knowledge domains of vulnerability. The various interpretations of vulnerability (and its determinants) differ in their conceptual framework, rankings of (groups) systems or regions, and in the strategies to reduce vulnerability (Füssel, 2010). The ambiguity of these interpretations and lack of operational definitions of concepts provoke new insights in the field yet it confuses the conceptualizations of vulnerability (Füssel, 2010), which present difficulties in the
making of climate change policies (assessments) because it is not clear in the research if vulnerability is presented as an outcome or in the context in which the impact of climate change is dealt with (Adger cites O’Brien et al, 2005; Adger, 2006).

In his efforts to address confusing interpretations Brook (2003) looks at and clarifies the relationship between current concepts of vulnerability, risk and adaptation, and concludes that such confusion of interpretations can be addressed by differentiating social from biophysical vulnerability. Brook (2003) suggests that while inserting social vulnerability within the context of risk, and considering the relative closeness between vulnerability and risk it can reduce the confusion caused by different interpretations of vulnerability. IPCC’s defines vulnerability to climate change as the function of the system’s (group) exposure, sensitivity, and its capacity to adapt to stimuli, thus, IPCC’s definition suggests the outcome vulnerability approach (Füssel, 2010). Adger (2006) holds a different interpretation of it while sustaining that IPCC’s (MCCMarchy et al, 2001) definition of vulnerability considers the characteristic of a given system and the function of the system’s exposure, sensitivity, and adaptative capacity, and hence Adger (2006) suggests that IPCC’s definition of vulnerability considers both the context and outcome approaches.

Füssel (2010) refers to the contextual (social) and outcome concepts of vulnerability, which are used respectively by social scientists for exploratory purposes and by natural scientists for descriptive applications. The contextual concept is framed with the political economy approach, whereas the outcome concept “combines information on potential climate impacts and on the socio-economic capacity to cope or adapt” (Füssel, 2010 cites O’Brien et al, 2004; O’Brien et al, 2007; Füssel, 2007). Where
it concerns strategies to reduce vulnerability the contextual studies often focus on sustainable development strategies to increase the human populations’ capacity to respond to an array of hazards, while the outcome studies use technological adaptation to minimize climate change impact (Füssel, 2010 cites O’Brien et al., 2007; Eriksen and Kelly, 2007). If in one hand Füssel (2010) maintains that the integration of vulnerability assessments from different schools add to the current confusion in the conceptualization and vulnerability terminology, on the other hand Adger (2006) portrays such integration (diversity) not as weakness but as “strength and sign of vitality in the vulnerability” scholarship.

2.1.4 The “Biophysical-Social” Resilience Domain of Vulnerability

In his assessment of the various theories of vulnerability Adger (2006) maintains that there is an emerging system-oriented theory from the disaster and entitlement theories that suggests conceptualizations and methods that use a holistic (integrated) approach to understand and address the vulnerability of social and natural systems. The author refers to the work of Turner et al. (2003a), Liverman (1990), Luers et al. (2003) Eriksen et al. (2005), and Eakin (2005) to support his argument that vulnerability is an outcome from the occurrence of multi-level interactions within social-ecological systems, and that the assessments of vulnerability utilize an array of key conditions when creating qualitative and quantitative variables from processes and outcomes of vulnerability. IPCC AR4 defines that “A threshold marks the point where stress on an exposed system or activity, if exceeded, results in a non-linear response in that system or activity”. Adger (2006) maintains that a generalized (non-linear) measurement of the degree and severity
of vulnerability can be determined through the threshold of risk, danger, or wellbeing, and it should be able to “identify the proportion of the population that are vulnerable, be sensitive to distribution of vulnerability within the population and to the severity of the vulnerability (distance from threshold)”. Key elements of adaptive capacity and the impact of extreme climatic and non-climatic thresholds causing vulnerabilities can be identified through vulnerability assessments, and these elements can suggest the resilience of social-ecological systems (Adger, 2006).

The vulnerability scholarship can advance debates on adaptation and resilience yet it is challenged by the lack of measurement, and the difficulty in handling the perceptions of risk and governance. Adger (2006) proposes an interdisciplinary approach to vulnerability that reflect the measurable outcomes from social processes, and integrates an interdisciplinary array of methods such as vulnerability maps using triangulation of data that relates space with vulnerabilities. The author explains that vulnerability shall also consider individual perceptions of vulnerability, risk and resilience, and the change of perceptions of social and environmental systems that are influenced by time and space, and cultural choices based upon values and preferences. Additionally, one’s perceptions and choices might differentiate thresholds of groups, their adaptative capacity, resilience, risk and adaptation to changes in humans and ecological systems, and therefore, such thresholds should be subject of external interpretations (Adger, 2006).

The work of Boon et al (2012) advances the adaptation and resilience paradigm that in many ways is in unison with Adger’s interdisciplinary (and holistic) approach to vulnerability. Since the impact of climate change involves both rapid and slow onset stressors the authors used a resilience definition that applied to both individual and
community resilience, which is defined as “a process linking a set of adaptative capacities to a positive trajectory of functioning and adaptation after a disturbance” (Boon et al, 2012 cites Norris et al, 2008b, p. 130). Boon’s et al (2012) framework considers the interdisciplinary attribute inherent to vulnerability, they use “step-wise mixed-methods” that consider individual conceptions of climate change risk, and integrates different approaches including surveys, interviews, and used Rasch analysis to quantify collected data, which then was applied in the structural equation modeling (SEM) to evaluate (measure/quantify) the interactive forces that suggest the resilience of socio-cultural systems. The purpose of Boon’ et al (2012) work was to understand if individuals that experienced and remained in their disaster-impacted communities became more resilient to climate disasters.

The authors used the Bronfenbrenner theory, which use the interaction among its five systems including the exosystem, mesosystem, microsystem, and chronosystem, to understand individual behaviors within social contexts. This theory enabled them to apply a comprehensive framework to assess the interactive forces that support resilience across four Australian communities. These communities experienced different disasters including bushfire, drought, flood, and cyclone that took place respectively 1, 8, 1 and 5 years prior to the study start. The findings of the study indicated that resilience to climate events across all four communities was an individual trait and a process mediated by adaptability and community factor. The “sense of place” and adaptability directly influences the communities’ resilience; the indirect influences (associated with adaptability) include financial capacity for quick rebuilding of infrastructure, housing, and essential services, and support from family and friends, communication of climate
hazard, and knowledge and trust in the sources of climate change communication. The residents who resisted to the disaster generally would stay in the community, whereas the ones who had no community support and financial support from state and federal sources, probably would not stay in the community.

2.1.5 Applicability to the Dissertation

In this section I presented the different scholarships on adaptation, with an emphasis on the social sciences arguments for adaptation. The adaptation framework in the dissertation was drawn from Smit’s and Wandel’s (2006) *practical adaptation*, where indigenous knowledge and experience are used to develop community-based assessments of their community’s conditions and sensitivities, to create and strategize actions to increase the resilience, and in turn the adaptive capacity of their community. My investigation concerns a participatory planning process wherein stakeholders developed land-use assessment of their community to create various land-uses zoning, which were incorporated in the master plans they developed.

Based on an extensive bibliography Füssel (2010) suggests two scholarships based on the interpretation and determinants of vulnerability, which include the “internal-external” and “biophysical and social” arguments. Following on these two arguments the author introduces the “contextual” and “outcome” frameworks of vulnerability. The epistemology, anthology, and methodology I used in the dissertation is aligned with the “internal-external” and “contextual” vulnerability framework in the dissertation. This framework is used by social scientists for exploratory purposes, it is framed with the political economy approach, and proposes that the vulnerability to harm from hazards is
determined by internal characteristics of the system. Brook (2003) considers the
closeness between vulnerability and risk while placing social vulnerability within the
context of risk. I see the benefit from incorporating Brooks’s (2003) argument, and for
my dissertation I framed both social and economic vulnerabilities as social vulnerability.
After all, climate change adaptation is a social process where “the ability of societies to
adapt is determined, in part, by the ability to act collaboratively” (Adger et al, 2003).

2.2: Mainstreaming Multisectoral and Value-Based Adaptation

2.2.1 Social Vulnerability: Multisectoral Adaptation and the Shift from
Biophysical to Social Processes.

Coping strategies can restrain development processes, and economic and
environmental sustainability (Daves, 1993). They are short term measures to minimize
risk, that may over the long term undermine livelihoods and increase vulnerabilities to
(the impact of) hazards caused by climate variability (Davies, 1993), principally of
marginal groups that are disenfranchised on the basis of their social-economic, political
(Ribot et al, 1996; Blaikie et al, 1994) and cultural background (Handmer, 2003).

McGranahan et al (2010) suggest that measures to address more immediate risks can lead
to adaptation, and planners have an important role on this. Coping can become part of
the adaptation process if coping and adaptation strategies are framed with the perceptions
of the impacted groups, and are systematically used to reduce their sensitivity and
increase their resilience (Davies, 1993; ICLEI, 2013) toward hazard impact. A case in
point, the access model proposed by Blaikie et al (1994) tackles the socio-economic
systems that cause disasters, and may advance inclusive social-economic change. The
model applies to natural events that have already been experienced by the individuals and or groups. It consists of a set of eight strategies (actions) to implement before, during and after the natural event, and that engage individuals and groups in coping for more active and permanent actions (adaptation) to secure their livelihoods.

The increase of the incidence of and frequency of climate (natural) disasters in the past decades has brought climate variability and change to the attention of policy-makers and the media, yet such acknowledgement may be an opportunity for policy-makers to neglect the relevance of adaptation policies to address natural hazard (Handmer, 2003). The author sustains that the increased impact and losses from natural disasters, faced by the more vulnerable groups, more often has to do with non-climatic factors like social-economic and political forces factoring in the vulnerability of and inhibiting the adaptative capacity of human systems. These factors include world population, urbanization, disruptive socio-economic trends, globalization, and environmental degradation, cluster of poverty, and wars or civil unrest. Thus, instead of focusing on the risk (the overall problem including climate) that individuals and communities might experience, and to whom and where losses are felt, adaptation policies should focus on the causes leading to vulnerability to climate (Handmer, 2003; Wisner et al, 2003). The author suggests that in this case a multisectoral generic approach to hazard research would be more effective for those at risk than the specific approach, yet in certain circumstances a specific measure or the combination of both generic and specific measures may apply. The effectiveness of the multisectoral approach is explained by the fact that it addresses multiple goals, covers many areas and so promotes adaptative capacity, and by default it possibly will increase resilience to all climate hazards through
the improvement of buildings and infrastructure, planning, and by easier access to resources when disaster hits (Handmer, 2003).

The disproportional vulnerability among impacted groups based on social-economic factors and the use of multisectoral approaches to increase adaptative capacity, and so to decrease the vulnerability of impacted groups, is also pertinent in Moench’s (2007) work. The author makes reference to case studies from U.S., Netherlands, Pakistan, India and Nepal when arguing that systemic factors inhibit adaptative capacity and increase vulnerabilities, and so adaptation measures or public interventions should be founded in a common approach that integrate adaptation and reduction of disaster risk. Here, the author refers to Winer’s et al (2004) concept of disaster vulnerability framed with the pressure and release approach, and suggests that it focuses on the connection between the progression of vulnerability, disaster and hazard, in which the progression of vulnerability is associated to its “root causes, dynamic pressures, and unsafe conditions”. The systemic factors observed in Moench’s (2007) study can relate to the human health vulnerability caused by systemic factors concerning the individual and group inaccessibility to public services and urban infrastructure. A case in point, the inefficiency of the public system (urban management), and/or the lack of accessibility of individuals and groups to public services, infrastructure, sanitation and health services on a regular basis (systemically) is a non-climatic uncertainty that impacts human health (Balk et al, 2010). This is aggravated with the impact of climate variability, which increases individual and group vulnerability to extreme events and their capacity to cope or adapt to climate change; under these conditions individual and groups are double-exposed to risk and to the impact of hazard (Handmer, 2003; O’Brien and Leichenko,
The author’s argument is framed with the pressure and release approach to adaptation studies.

Wisner et al (2003) argument for social vulnerability aims to address the disproportional vulnerability of and double-exposure of impacted groups to risk and hazard. In their work concerning the social causations of disaster risk the authors argue that the interpretations of disaster articulated in the media and the climate change scholarship is overwhelming centered with the natural hazard (naturalness) debate, and that it neglects the social causations of vulnerability. Disaster must not be only about hazards typology yet about the different levels of vulnerability of individuals and groups, which Wisner et al (2003) propose is determined not by natural forces but by social systems and power within national and international political and economic contexts. Wisner et al (2003) maintain that the prevalence of geophysical and biological (biophysical) over social-economic and political processes (and vice-versa) in disaster causation is conditioned by the spatial and temporal dimensions. The social and political conditions can make individuals and groups more susceptible to climate hazard impact as well. Political and socio-economic emergencies are non-climatic determinants (Smit et al, 2000) that can create situations where populations have limited access to information, institutional support, and mobility, which then undermines their resilience and capacity to respond to extreme events (Adegar, 2006; Moench, 2007).
2.2.2 Mainstreaming Adaptation through Developmental Initiatives

IPCC AR5 indicates that “National adaptation to climate change will involve stand-alone adaptation policies and plans as well as the integration or mainstreaming of adaptation measures into existing activities (OECD, 2009).” That will require that all spheres of government mainstream adaptation and disaster risk management initiatives to adopt, expand, and enhance measures that incorporate disaster and climate risks into their planning, policies, strategies, programs, sectors, and organizations (IPCC AR5 cites Few et al, 2006; UNISRS, 2008a; OECD, 2009; Biesbroek et al, 2010; CACCA, 2010). The challenge to mainstreaming adaptation is its implementation and not in planning it (IPCC AR5 cites Biesbroek et al., 2010; Krysanova et al., 2010; Tompkins et al., 2010), and the barriers to mainstreaming include lack of funding, limited budget flexibility, lack of relevant information or expertise, lack of political will or support, and institutional silos (IPCC cites Krysanova et al., 2010; Preston et al., 2011). To overcome such barriers, it is necessary coordination among sectors of governance, which include stakeholders from a broad range (IPCC R5 cites Few et al., 2006; Thomalla et al., 2006; OECD, 2009).

The prospect of high costs to implement adaptation measures is drawing the attention of policymakers to the urgency of addressing climate change adversities through anticipatory adaptation (UNFCC, 2007) measures mainstreamed in existing projects, planning and development programs, which requires decision-makers’ increase awareness of the prospective adversities caused by climate change before mainstreaming such issues in their actions (Huq and Reid (2004). The literature that supports mainstreaming points out that the link between climate change adaptation and
development is observed at the local through the sectoral, national, regional and global levels, which is taking place in both more advanced economies and the developing countries. Smit and Wandel (2006) cite Huq and Burton (2003), Huq et al (2003), Huq and Reid (2004) and point that generally the adaptation measures to reduce vulnerability are not stand-alone initiatives, instead they are mainstreamed with and are incrementally implemented to adjust existing water or risk management, and other developmental strategies. Whether explicit or not the adaptation processes are greatly discussed in the risk and resource management, community development, planning, and sustainable development fields (Smit and Wandel, 2006).

IPCC AR5 indicates that the success of adaptation plans observed in Australia, United States, European countries, and Africa’s and Asia’s major river basins was through mainstreaming adaptation in national policies and plans, while taking advantage of existing synergies with national goals (Biesbroek et al., 2010; Tompkins et al., 2010; Preston et al., 2011). Following on that line I am considering that successful adaptation policies can be conditioned to their comprehensiveness when addressing the determinants of vulnerability, which Schipper (2007) states to be the role of development policies. The former leads to the understanding that adaptation initiatives are inherent to development policies (Burton, 2004; UN Habitat, 2011; ICLEI, 2013, Schipper, 2007) since they can address simultaneously social-economic and environmental vulnerabilities. On the same lines, Burton et al (2002) argue that the first-generation research of and approaches to adaptation policy were generated to support mitigation, and so they were framed with the climate change and not the development context. With the perspective of the risk and hazard tradition of adaptation studies, the author proposes the “development” view on the
premises that climate variability itself impacts human systems that are detrimental to
development, and that both climate variability and climate change undermines people’s
livelihood. Burton suggests that adaptation measures should be implemented in two
phases. Both phases assess and address the vulnerability of human and natural systems
via structural and non-structural measures. However, in the first phase adaptation is short
termed and addresses immediate risks faced by these systems. The author sees climate
change adaptation as a “process” in which phase one sets the basis for the advancement
of a more climate change oriented agenda to be carried through the second phase.

A mainstreaming situation is observed in Moench’s (2007) arguments for the
integration of risk reduction and climate change adaptation. The author suggests that
adaptation policy may entail incremental change, or a robust change that generally takes
place in the aftermath of the disruption of regional infrastructures. The author puts
forward that the aftermath of the disruption caused by the Hurricane Katrina (US) created
a “window of opportunity” for the implementation of long term adaptation measures to
minimize risks via reconstruction action (s). The responses to disaster risk requires not
only an interdisciplinary approach but a cross-sectoral approach as well since they will
engage public, private and no-profit organizations linked to land-use and planning, and
education, for instance (Moench, 2007). In a move from adaptation and disaster risk
theory to action the author considered a local-context that holds a pluralistic setting of
representation, and developed a systematic course of actions that includes scoping,
building common understanding, and structural review of potential strategies and, when
applicable, include financial evaluations. In that context, the author suggests that this set
of actions may support the argument for integration of climate change measures (policies)
with sustainable development strategies, yet generally mainstreaming adaptation policy through development programs tend to be incremental. However, development contexts are a primary window of opportunity since they allow the identification and analysis of and long-term solutions for problems, if they advance planning it will be an “entry point” to implement more robust change (Moench, 2007).

Policy makers and stakeholders, mainly from more advanced economies, tend to focus the climate change debate and policy in the mitigation-adaptation synergy, and within sustainable development goals (UN Habitat, 2011; 2014). Sustainable development paths that include sustainable land use planning will contribute to climate change adaptation (and mitigation) while increasing resilience and decreasing vulnerability of impacted populations (IPCC AR4, AR5; ICLEI, 2013). Robinson et al (2006) cites the recommendations of the British Columbia’s Climate Change Economic Impact Panel (CCEIP) to frame climate change within the context of sustainable development strategies that aims for the achievement of social, economic and ecological goals; and government’s decision-making is to be “screened using the sustainability lens”. The authors cite IPCC AR3 and point to the interconnectivity between gas emissions and adaptation, and to the approach of integrating GHG reduction in development strategies to address the impact of climate change. In fact, long-term GHG mitigation aggregated to technological innovation can be more effective than climate change policies (Robinson et al, 2006).

However, Cole and Liverman (2011) caution that emissions and climate change policies can compete. The authors refer to Brazil’s management of Clean Development Mechanism (CDM), which addresses both the development-related and social and
environmental priorities. The first priority is addressed via substantive measures while
the second uses procedural mechanisms. However, there is a competition in terms of
prioritization and funding allocation, and to avoid the competition both the substantive
and procedural are to be considered and integrated from the conceptualization through the
implementation of the CDM.

The adaptation scholarship cited in this section points to the relevance of
development contexts, and the propensity of and the benefits from mainstreaming
adaptation measures through developmental initiatives. Framed with a similar
perspective the following section advances the arguments for community-based
vulnerability approaches, with emphasis on the “practical adaptation” approach sustained

2.2.3 Community-Based Adaptation and Valuable Indigenous Knowledge

There is an increasing research interest in participatory strategies to create climate
change adaptation measures that can be incorporated (mainstreamed) into government
policies. The levels of involvement of the stakeholders, the time in which the participants
are brought in the research process, the research’s epistemological underpinning and
purpose, and the context in which the research takes place can lead to different
methodological variations of the participatory research and their outcomes (Selener,
1997; Stringer, 2007). Action research (AR) is one of the participatory strategies that is
getting the attention and interest of the research community (IPCC A4). It is a
community-based action-research approach in which the central role is played by
nonprofessionals (Park, 2001) whereby stakeholders identify their community’s problem,
elaborate research question(s), and collect and analyze data that lead to the development and implementation of an action plan (Selener, 1997; Stringer, 2007). AR has been tested by researchers, funding agencies and governments of both developing and the more advanced countries, and it has been generally used to engage community stakeholders in research and decision making processes to address local concerns primarily related to education, community and rural development (Selener, 1997; Stringer, 1997).

Community-based research approaches are also applied in the international development, sociology, anthropology, ethnology, risk assessment and food security fields (Smit and Wandel, 2006 cite Bolling and Schulte, 1999; Ryan and Destefano, 2000; Pelletier et al, 1999; Smith et al, 2000). Smit and Wandel (2006) point out that community-based analytical frameworks have been applied in the disaster management and climate change adaptation fields. The community-based approach is the most desirable and effective of the approaches because it is where the groups at risk are (Handmer, 2003) and the more recent vulnerabilities are used for the advancement of risk assessments (Huq and Reid, 2004). It is about decision-making and deliberation processes, social change, and human and natural resources. Huq and Reid (2004) introduce the Australian Landcare Programme, which engages 5,000 groups of local land owners and sympathizers in processes which locals identify land-use issues and related problems, and create and decide for the more appropriated solutions for the problems they were facing.

Case studies showcasing participatory research programs used worldwide indicate positive outcomes resulting from its application yet they are not necessarily proved
because of the difficulty to quantify qualitative data (IPCC A4). They can be costly, lengthy, and enforce existing socio-economic and structures and power groups (Selener, 1997; Stringer, 2007; IPCC AR4), yet they can create networks and improve dialogues, accessibility to climate change information and communications among impacted groups, stakeholders and decision makers (IPCC AR4 cites Toth and Hizsnyik, 2005; Bizikova et al, 2010; Jarraud et al, 2012; Boon et al, 2012). On the other hand, a second group of researchers argue that community participation may be limited to research at a local level, that (generally) the communities do not truly participate in decision-making because they lack technical skills to understand and to engage in a science based dialogue, and because of the difficulty that communities have in connecting local to regional and global climate change (IPCC AR4). Thus, these researchers question if community participation truly ever takes place.

A counter-argument to the former can be made based on Smit and Wandel’s (2006) positioning that through participatory vulnerability assessments, the stakeholders are able to identify the social-ecological determinants of (individual and) their community’s vulnerabilities, and that the stakeholders identify the co-relations between sources of exposure, sensitivities and their adaptative capacity over subsequent climate events. The authors also suggest that the impacted stakeholders identify the sources of their “exposures, sensitivities, and adaptative capacities function across-scales – from individual to national (regional-global). When using this approach, the community is the subject of interest, and the facilitators apply (ethnographic) methodology while using semi-structured interviews, participant integration and focus groups. The approach entails the assessment of existing exposure, sensitivity and adaptative capacity by the
community. In a subsequent step, they integrate the findings of their assessment with information originated from scientific sources, policy analysts, and decision-makers to identify future exposures, sensitivities, and adaptative capacity to determine future vulnerabilities. In the final step policy-makers and public agencies will seek for opportunities to reduce future vulnerabilities.

There are various references of case studies in the climate variability and change fields underpinned with the application of community-based strategies. To name few, they include strategies to enhance community resilience in Sudan (Desai et al, 2004) and Australia (Boon et al, 2012); U.K. stakeholder-led regional integrated assessment (Holman et al, 2008); Vietnam’s coastal area vulnerability and Red River Delta (Kelly and Adger, 2000); assessment of climate change implications in Arctic Canada (IPCC AR4 cites NRBS, 1996); climate and environmental trends in Russian boreal forest (IPCC AR4 cites Vlassova, 2006); community base assessment in Samoa (IPCC AR4 cites Sutherland et al, 2005), Costa Rican scenario building exercise (IPCC AR4 cites MA, 2005); food security dialogues in Uganda (IPCC AR4 cites Twinomugista, 2005); participatory scenario planning in Sub-Saharan Africa (CARE Africa, 2011), participatory scenario development in Sub-Saharan Africa and South Asia (Bizikova et al, 2010), Australian Land care Programe (Huq and Reid, 2004), and participatory future methods in Australia (Gidley et al, 2009).

2.2.4 Applicability to the dissertation

This portion of the literature review focuses on the multisectoral approach arguments to climate adaptation, with mainstreaming adaptation measures in
developmental and planning initiatives implemented through community-based schemes. The literature here suggests that non-climatic vulnerability, based on socio-economic triggers and political constraints, makes underrepresented groups more vulnerable to risk and hazard since it inhibits their capacity to adapt to climate vulnerability (Handmer, 2003, Wisner et al, 2003). A plausible approach to address these groups’ vulnerability is to focus on the triggers of that vulnerability (Handmer, 2003; Wisner et al, 2003), and mainstream multisectoral approaches in developmental (Handmer, 2003) and planning initiatives (Moench, 2007), to address the non-climatic vulnerability of underrepresented groups to strengthen their adaptative capacity, and possibly their resilience (Handmer, 2003, Wisner et al, 2003, Moench, 2007).

The case study of the dissertation is the state-led program City for Us. The program advances Brazil’s national urban development policy, which was inexistent until its implementation by the Brazilian Ministry of the Cities in 2003. The vulnerability discussion in my dissertation concerns planning processes, land-use practices, and governance-equity issues in the participatory planning process under the program City for Us. The relevance of the literature review under this section is based on the aforesaid reasons. Moench (2007) suggests that developmental contexts are primary windows of opportunity to implement long-term measures, and that they are “entry point” for policy makers to introduce more robust climate related measures through master plans. Since the master plans developed through the program City for Us advances the national urban development policy, I contemplate that the program was an “entry point” to implement a more robust climate related policy in the subsequent revision of these master plans.
2.3 Global Processes, Urban Expansion, and Climate Inequity Issues

2.3.1 Urban Expansion, Sustainability, and the Climate and Non-Climatic Vulnerability Resulting from Changes in Land-Use and Cover

Communication, transportation and technology are intertwined human endeavors that enable human activities within social and economic systems that propel urbanization and the formation of cities – a human system. On the same token, biophysical systems (ecosystems) are reproductive self-propelling, and integrated in the natural system. Although both the human and natural systems have a “life” of their own and self-perpetuate themselves, the natural is losing terrain. Kotchen and Young (2007) argue that these systems are “coupled” because they influence each other. The authors point out that we are entering the “Antropocene” era (Kotchen and Young, 2007 cites Crutzen and Stoermer, 2000), wherein human actions play a critical role in a series of biophysical systems. Cities are human-dominated systems emerged from the interaction of human choices and activities with biophysical systems (Alberti et al, 2003), and their spatial organization and infrastructure can impact the availability of natural resources to support the urban activities (Alberti et al, 2003; Rosenzweig et al, 2011). Technology and finance are key factors influencing both the built environment and urban form, and transportation is a determinant trigger shaping the urban form and the city’s proximity to the natural systems (Rosenzweig et al, 2011; Sánchez-Rodriguez, 2010) which include watersheds, coastal areas, deserts and forests.

Cities cover about 1 to 6 percent of the planet but their ecological “footprints” (Alberti et al, 2003) or “zones of influence” (Sánchez-Rodriguez, 2010) are significant large, complex, and extend beyond the urban perimeter (Alberti et al, 2003; Sánchez-
Rodriguez, 2010). Cities demand a large supply of critical ecological services (Balk et al, 2010 cites Hassan et al) that include food, energy, water, construction materials, wildlife corridors, and microclimate drawn from the “peri-urban” areas (Sánchez-Rodriguez, 2010). The author suggests that once spurred by technological advancement and globalization of the capital the cities’ influence can go beyond national boundaries. Alberti et al (2003) suggest that cities are complex ecological phenomena that hold their own triggers, which stimulate growth and development, and are important factors influencing the global ecology. In spite of that, cities from more advanced economies can be seen as an adaptation against hazards (Handmer, 2003).

Urban dispersion can be determined by many reasons including the patterns of residential development, and land speculation known a “leapfrog development” in which land is left vacant while urban “development passes by”; that increases the social cost of urban development infrastructure (Hogan and Ojima, 2010). The authors explain that patterns of residential development can be motivated by contemporary lifestyles of groups within the urban population, who are in search for proximity to nature. As it concerns the residential development the authors maintain that land and house affordability is a social (and economic) determinant of urban dispersion. Urban land (land and housing) is understood as land served with infrastructure for mobility and public services that includes water, energy, and sanitation systems (Balk et al, 2010; Rosenzweig et al), which can become inaccessible, expensive, used inefficiently. In that case, urban land can cause an excessive demand for energy and uncontrolled city growth and sprawl, which can exacerbate consumption of natural resources, and increase GHG emissions (Condon et al, 2009; Sánchez-Rodriguez, 2010; Rosenzweig et al, 2011).
While a product of the human-dominated system urban land practices very often result in urban ecologies that Kates (2002) suggests having very limited resilience or adaptive capacity, regardless of climate change. Alberti et al (2003) explain urban ecology as a human-dominated system in which humans are integrated into ecological processes underpinned by interactive human choices and activities, and biophysical elements.

The decrease in build-up density, along with the continued population and urban growth, and demand for urban land, forces local governments to expand city limits and its network of arterial roads (Angel, 2010). In their work addressing housing informality in Latin America Angel (2010) and Smolka and Larangeira (2010) maintain that in many cases there is no shortage of urban land but a shortage of affordable urban land serviced with sewage, piped water and other basic urban infrastructure. Within that context, there is a large urban population under poverty with no accessibility to basic public services such as drinking water and sanitation, thus, they are disproportionally more vulnerable to changes of resource availability and to the impact of biophysical (climate) events and climate change (Kotchen and Young, 2007). Non-climatic stresses such as lack of serviced land in combinations with social-economic and political uncertainties can increase the vulnerability of individuals and groups.

The impact of cities on the environment cannot be avoided yet it can be minimized with the implementation of sound land-use planning and development policies (Sánchez-Rodriguez, 2010; Handmer, 2003; Balk et al, 2010; Rosenzweig et al, 2011). These policies should be neither fragmented nor a “technical exercise of planning” that addresses the urban elements individually (Sánchez-Rodriguez, 2010). The author sustains that generally public policies used to address urban and environmental stresses,
while advancing urban sustainability, have fallen short because they fail to balance the triggers of economic growth and environmental change, and the improvement of the social wellbeing of the urban dwellers. In his argument for urban sustainability Sánchez-Rodriguez (2010) bridges the discussion of urbanization and global environmental change (GEC), on the basis that the policies should reflect the urban complexity, which is the outcome of the interactive socio-economic, geopolitical and environmental processes, interplayed within local, regional and global contexts. Adaptation is linked to urban and environmental problems, and so investments addressing these problems can simultaneously help individuals and groups to adapt to global climate change (Sánchez-Rodriguez, 2010). The author cites Wisner’s (2004) argument for the vulnerability-equity interplay, which influences the ability of individual and groups to anticipate, cope, resist and recover from the impact of natural hazards.

2.3.2 Global Processes, Urban Expansion and Inequity Issues within Climate and Non-Climatic Vulnerability

The fast pace of urbanization and global environmental change, along with population growth, land degradation and environmental losses are global processes of economic, demographic, and political dimensions (Blaikie et al, 1994). The authors explain that global processes interact with each other, that the dynamics of these processes vary and its outcome is unpredictable, and that the interactions of global processes might raise the vulnerability of individuals and groups to disasters. O’Brien and Leichenko (2000) and Sánchez-Rodriguez (2010) point to the limited availability of studies that investigate the concurrent impact of climate change and globalization on
regions, sectors, ecosystems or social groups, and how they impact each other (O’Brien and Leichenko, 2000; Sánchez-Rodriguez, 2010). The combining ramifications of the socio-economic and environmental impact of climate change and globalization inflict regional double-exposure of winning or losing individuals and groups (O’Brien and Leichenko, 2000; Blaikie et al, 1994) across the globe, between more advanced economies and developing countries, and between regions within these countries (Gough, 2011; Thomas and Twyman, 2005; Adger 2001; Kates, 2000). The losers include groups that have less access to resource, technology and in the decision-making process (Adger, 2003).

Non-climatic changes such as demographic, socio-economic and technology can increase the exposure and vulnerability of human and natural systems to climate change. On the other hand, these changes can unintentionally reduce vulnerability (Pittock and Jones, 2000) and exposure to climate change. For instance, socio-economic stability decreases vulnerability of the impacted systems and enhance their flexibility to respond (adapt) to climate variability and change (Smithers and Smit, 1997). In a similar vein, the findings from the assessment of the vulnerability, risk-hazard and the adaptative capacity of the “complex reality” of Brazilian livelihood done by Lindoso et al (2010) indicated that despite climate events magnitude and increased individual and group vulnerabilities, a combination of institutional strength with measures tackling socio-economic conditions are themselves increasing their adaptive capacity.

O’Brien and Leichenko (2009) points to the equity and temporality dimensions of climate change, and suggest a more people-based discussion of climate change rather than an environmental issue. Climate justice is the discourse of the justice paradigm
within the context of social and environmental inequity. Milanez and Fonseca (2010) maintain that climate justice is an extension of the argument for “environmental justice” as it concerns the disproportional impact of climate change events, such as desertification and sea level rise, on certain social groups over others. The authors argue that “climate injustice” is visible but not totally addressed. Inequity is intrinsic to climate change, which is unjust and without doubt elevates ethical concerns (Barker et al, 2008) and so justice takes center stage in the ethics of climate change (Barker et al, 2008 cites Broome – forthcoming). The author makes reference to Rawl’s (1971) theory of ethics and justice, in which the privileges of the most advantaged groups are justified only if it maximizes the welfare of less advantaged ones. That is not the case under the neoclassical economist perspective of climate justice since most often the less privileged groups are not directly responsible for the green gas concentration, nor benefit the most from the use of non-renewable energy carried through mitigation or adaptation initiatives (Barker et al, 2008). The authors assert that these groups are impacted the most, and yet generally they have less capacity to cope or adapt to climate variability and change, and are misrepresented in climate change assessments and cost-benefit analysis that inform climate change policies – which is a “triple injustice”

Gough (2011) points to the distributional problems presented with the implementation of UK’s carbon mitigation policies (CMP), which is based on patterns of energy consumption, and inflicts “double injustice” upon groups and populations that less contribute to climate change yet are the most vulnerable to it. Distributional issues is also observed in the implementation of adaptation measures (Sánchez-Rodriguez, 2010; ICLEI, 2013; O’Brien and Leichenko, 2009) since they may benefit some more than
others while enforcing inequality, the exclusion of existing disenfranchised groups that become more exposed to risks to climate variability, and the loss of their livelihoods (Blaikie, 1994; Kates, 2000; Adger et al, 2003, 2005; Handmer, 2003). There is a strong correlation between poverty and vulnerability but Blaikie et al (1994) suggest that researchers and policy makers keep them separate because anti-poverty programs aiming to increase income and consumption may result in triggers of vulnerability to natural hazards, and disasters impact. Blaikie et al (1994) states that the access to material and non-material resources to maintain household’s livelihoods is secured through one’s rights and positioning within the household in the “structures of domination”. The authors use their ‘access” model framework to explain that the levels of impact of natural hazards on individuals and groups are determined by structures of domination within social systems, and that in the aftermath the women (and children, elderly, migrant) are the ones most vulnerable to natural disaster.

2.3.3 Applicability to the dissertation

This last section of the literature review contextualizes and relates climate inequity issues with urban expansion and global processes. The section presents urban ecology as a “human-dominated system in which humans are integrated into ecological processes underpinned by interactive human choices and activities, and biophysical elements” (Alberti et al, 2003). Cities are human-dominated systems that claim a significant source of “critical ecological services” (Balk et al, 2010 cites Hassan et al) like food, energy, water, construction materials, and wildlife corridors (Sánchez-Rodriguez, 2010). The many determinants of urban dispersion (expansion) include the
change of demographics and decline of build-up density (Angel, 2010), housing, land
speculation, patterns of residential development (Hogan and Ojima, 2010), shortage of
affordable and serviced urban land (Angel, 2010; Smolka and Larangeira, 2010), and
technology, finance, and transportation which influences the built environment and urban
form (Rosenzweig et al, 2011; Sánchez-Rodriguez, 2010). These determinants create
demand for urban land in the Brazilian biome *Cerrado*, it forces local governments to
expand city limits and its network of arterial roads (Angel, 2010). Non-climatic stresses
such as lack of serviced land in combination with social-economic and political
uncertainties can increase vulnerability of populations living in the *Cerrado*. In contexts
like that it limits the resilience and adaptive capacity of individuals and groups
independently of climate change (Kates, 2002). The *Cerrado* is the context wherein the
phenomenon I investigated took place.
CHAPTER 3

RESEARCH DESIGN

In this chapter I present the qualitative paradigm underlying my investigation, the methodology, and methods used in the research. This chapter is presented in five sections. I start Section 3.1 with the introduction of the tenets of the qualitative paradigm, which leads to the presentation of the ontology, epistemology, and methodology in the research. The conceptual framework is presented, which pave the way for my arguments of using an adapted version of the constant comparative analysis (CCM) and coding technics to analyze the interviews’ transcripts. My rapport with the interviews is discussed in Section 3.2 in which I disclose to the reader my positionality, roles, and ethics prior and through the research. I begin Section 3.3 making a note about the relevance of combining qualitative and quantitative data in vulnerability studies. In the sequence, I present the data collection approaches which include interview guide, reflexive journals, and field notes done while I was in the field, and memos which I used throughout the coding-analysis process. I continue the section while presenting the data management. The sampling approached I used to selected the interviewees, and the composition of the and heterogeneity within the pool of interviewees to maximize sampling representation follows. The section ends with the profile of the poll of interviewees. The research credibility is discussed in Section 3.4. The coding-analysis of the transcripts was done in three phases. Here, I walked the reader through the three phases in which data passages from interview transcripts to illustrate the intertwined coding and analysis process. The adapted CCM used in the research is presented in Section 3.5. Here, I walked the reader
through the three coding phases wherein I use data passages from interview transcripts to illustrate the intertwined coding and analysis process.

**3.1 The Qualitative Paradigm**

Denzin and Lincoln (2003) identify eight “historical moments” of qualitative research, and suggest that the eighth (and current) historical moment engages both the social sciences and humanities in a critical work that discusses “democracy, race, gender, class, nation-states, globalization, freedom, and community”. The qualitative researchers are naturalistic (Lincoln and Guba, 1985), they use exploratory approaches of inquiry, and hold multiple and evolving personal biographies (Denzin and Lincoln, 2003) and abstract beliefs, which define the researchers’ theoretical paradigm (Lincoln and Guba, 1985; Denzin and Lincoln, 2003), philosophical assumption (Crotty, 1998), epistemology, and ontology (Creswell, 2007 cites Crotty, 1998), and alternative knowledge claims (Creswell, 2003). Within the context of the eighth historical moment Denzin and Lincoln (2003) suggested four main groups of theoretical paradigms that include the positivist and post-positivist, constructivist-interpretative, critical, and feminist-post structural. The naturalist (Lincoln and Guba, 1985; Denzin and Lincoln, 2003) or constructivist inquiry (Guba and Lincoln, 1994) falls under the constructivist-interpretative theoretical paradigm.

In this research, the qualitative paradigm hold the ontological- epistemological stand that reality has multiple interpretations, and that the researcher’s exposure and proximity to the human subjects who experienced the phenomenon, allows the researcher to better capture their understanding of the phenomenon under investigation. The former
is in unison with the research’s constructivist perspective (Guba and Lincoln, 1994) advanced by the climate change literature, whose work investigates processes, practices, and governance-equity where it concerns vulnerability and implementation of adaptation measures, and which argue that vulnerability is socially constructed. The ontological perspective advanced in the dissertation stands that vulnerability is context-specific, where vulnerable groups (human systems) face and explain their realities (vulnerability) differently. Where it concerns the epistemological stand, it suggests that both my exposure to the phenomenon while a visiting scholar during the implementation of the second phase of the program City for Us (the case study), and my proximity to the interview respondents who experienced the phenomenon I am investigating, allow me to better capture their references to vulnerability. The methodological approach I used is in line with the ontological-epistemological stand of my research.

The methodology used in the dissertation is supported by a qualitative literature that explains the pragmatism inherent to qualitative researchers, that suggests that a phenomenon can be approached in different ways (Crotty, 1998; Creswell, 2007), and that often combine various techniques to investigate a desired outcome (Lincoln and Guba, 1985, Denzin and Lincoln, 2003; Strauss and Corbin, 1998 cites Creswell, 1994; Creswell, 2007). Noteworthy to bring up to the reader’s attention that although the methodological approach I used is rooted in the naturalistic paradigm (Lincoln and Guba, 1985, Denzin and Lincoln, 2003), the aim was not to advance an anthropological, ethnographic, or sociological study of the phenomenon I am investigating.
3.1.2 The Conceptual Framework

Lincoln and Guba (1985), Denzin and Lincoln (2003), Glaser and Strauss (1967), Strauss and Corbin (1998), and Charmaz (2000) among other qualitative inquirers point to the relevance of using theoretical frameworks to increase the researcher’s theoretical sensitivity, yet they differ in how and when to use the frameworks. Anfara and Mertz (2006) explain the many benefits from using theoretical frameworks in qualitative research. In the same vein, Vogt et al (2013) suggest that the researcher should have a good understanding of the key concepts (themes) presented in the research question, prior to commence the coding process. My familiarity with these concepts comes within the conceptual framework (Rossman and Rallis, 2003) that I bring in the dissertation, my familiarity with technical literature (Strauss and Corbin, 1998) from the planning and climate change fields, my exposure to the phenomenon under investigation in the research, and my world view (Creswell 2007), theoretical perspective (Crotty, 1998). The conceptual framework kept me close to the respondents’ interpretations “emic” of the phenomenon that they experienced, while the theoretical framework places their interpretations within a broader and more abstract concept “etic” (Denzin and Lincoln, 2003; Rossman and Rallis, 2003).

The conceptual framework helps me to explore the various perspectives of the research. It defines the research’s purpose, supporting bibliography, methodology, and so the research’s design (Crotty, 1998). It influenced my choice of using the method (s) and sources of inquiry, and led me to the research question (Rossman and Rallis, 2003), which I used for exploratory (Glaser and Strauss, 1967; Denzin and Lincoln, 2003; Strauss...
and Corbin, 1998; Saldaña, 2013; Rossman and Rallis, 2012) and anticipatory purposes (Creswell, 2007 cites Rossman and Rallis, 2003, 2006). The sub-questions were used as implementation (Rallis and Rossman, 2012) or procedural steps (Creswell, 2007) to advance the research. Both central and sub-questions evolved and were modified through the research process.

### 3.1.3 The Adapted Constant Comparative Method (CCM)

Lincoln and Guba (1985) place Glaser and Strauss’ (1967) grounded theory within the naturalistic paradigm. The grounded theory’s classical CCM engages the researcher in an evolving process of generating theory as s/he advances through four evolving stages, in which the preceding stage prepares the subsequent one. The stages consist of comparing incidents applicable to each category, integrating categories with their properties, delimiting the theory, and writing the theory (Glaser and Strauss, 1967; Lincoln and Guba, 1985; Dye et al, 2000), or as per Glaser (1978) the stages include comparison of incident to incident, comparison of concept (category) to more incidents, and then comparison of concept (category) with concept (category).

The CCM has taken different turns and gone different directions through times while researchers elaborate modified versions within and between various disciplines and practices in the fields of sociology, education, anthropology, nursing, psychology, information systems, planning, and management to name a few. The fact that researchers use CCM does not necessarily characterizes it as a grounded theory design, yet the way its analytical method is conducted does (Glazer and Straus, 1967; Strauss and Corbin, 1998; Saldaña, 2013; Fram, 2013; 2008; Boeiji, 2002). By method I mean the technique
used to gather and analyze data, and as per methodology it stands by the strategy and the rationale (research design) that uses a specific or combination of methods linked with the wanted outcomes (Crotty, 1998). Following on that line, and as indicated in figure 5 below, the coding method I used in the dissertation is an adapted version of Glaser’s (1978) latest three stages version of CCM, which include comparison of incident to incident, comparison of concept (category) to more incidents, and then comparison of concept (category) with concept (category). Sub-section 3.5.2 presents a detailed explanation of the coding and analysis process wherein I applied the adapted version of CCM.

**Figure 5: Adapted Constant Comparison Method**

Source: De Oliveira, Euripides, 2016

Following on that line the coding method I used in the dissertation is an adapted version of Glaser’s and Strauss’ (1967) constant comparative method of coding and analysis, wherein I consider Strauss’ and Corbin’s (1998) conditional/consequential matrix to analyze the macro-micro interplay intrinsic in processes, and Saldana’s (2013) coding techniques. The reason for using Glaser’s and Strauss’ (1967), Strauss’ and
Corbin’s (1998), and Saldaña’s (2013) coding and analytical approaches was not to provide precise evidence of a theory systematically generated from the qualitative data (Glaser and Strauss, 1967; Strauss and Corbin, 1998) or validate existing planning and vulnerability theories. The aim was to use them as a systematic method of analysis, wherein I combined the theoretical ideas (emic perspective) generated from coding with the theoretical framework (etic perspective) drawn from a selected vulnerability literature

3.2 Building Rapport: Positionality, Roles and Ethics

My interest in researching the phenomenon is motivated by an ever evolving conceptual framework that includes my personal biography, philosophical stances, and knowledge, which the qualitative literature suggest along flexibility and theoretical sensitivity (Glaser and Strauss, 1967; Strauss and Corbin, 1998, Lincoln and Guba, 1985; Guba and Lincoln, 1994), theoretical awareness (Rossman and Rallis, 2003) leads me to a more tangible research venture as compared to a more abstract motivation. There are many benefits of the inquirer’s firsthand exposure to the respondent’s social world when conducting fieldworks (Glaser and Strauss, 1967; Lincoln and Guba, 1985; Strauss and Corbin; Rossman and Rallis, 2003). The authors suggest that in such exposure the inquirer immerses, observes and learn about the respondent’s life and actions, and develops the detachment necessary to theorize her/his observations and experience. In a similar vein, I have benefited from an earlier firsthand exposure to the social world of the research’s interviewees, and learned about their life and actions and to detach from them to properly fulfill my role as a visiting scholar through the implementation of the second phase of program City for Us, which is the case study for my research. My observation
had no other purpose than work with the Secretary of the Cities of the State of Goiás, Brazil, and on behalf of the university I work for, toward prospective programmatic initiatives.

The interest of advancing my research investigation about the vulnerability argument built into in the land-use discussion carried in the planning process under the program *City for Us*, did not happen until 2011, 5 years later when in my second year in my doctorate program. The climate change subject was neither under my radar and research agenda when I was not exposed to the phenomenon under investigation in this dissertation, nor was in the program’s and its participant’s agenda. Until prior the fieldwork the intensity of my immersion and involvement with the respondent’ social world was defined through the research purpose and design. This intensity was somehow modified later when doing interviews, coding and analyzing transcripts, and through the write-ups (Rossman and Rallis, 2003). In fact, such flexibility is necessary to advance my theoretical awareness through the research. I started the data coding and analysis with a clear research purpose and research question, with a general perception of the planning process in which the phenomenon I am investigating occurred, and with a theoretical framework. I kept in mind the cautionary advice from the qualitative literature that in spite of their relevance to enhance my theoretical awareness it can induce pre-conceived concepts that may constrain the trustworthiness of my findings.

The research is influenced by the researcher’s personal biography. Thus, I used my learning from my exposure to phenomenon under investigation wherein experiencing the implementation of the second phase of program *City for Us*, to address the insider-outsider positionality and my role as investigator in the research. Sultana (2007) suggests
that the positionality-subjectivity interplay is conditional based on both space and time, and so its dynamics vary accordingly with the context in which it takes place. The methodological benefits and conflicting positionality situations (Chavez, 2008) where the insider-outsider standing of the respondent and mine were not always so clear. I experienced firsthand the occurrences of multiple and interchangeable positionality (Sultana, 2007). The benefits of and yet mainly the situations of conflicting positionality, were more implicit and internally manifested, and they were more evident to me during the first interviews while I was adjusting to my role as a researcher. It was in fact an evolving process that I benefit from as I further advanced from one interview to another. I was frequently negotiating my role with all respondents (Stringer, 2007; Rossman and Rallis, 2003; Chavez, 2008, Sultana, 2007), so my role as researcher could be perceived by the respondent as “legitimate and non-threatening” (Stringer, 2007).

The researchers’ positionality, reflexivity, the way in which knowledge is produced, and power relations is critical to ethical international research (Sultana, 2007; Rossman and Rallis, 2012). They can face conflicting positionality that can lead to analytical issues (Srivastava and Hopwood, 2009) associate with cultural perceptions and language differences. I understand that the former was in many circumstances overcome because I am bilingual (Rossman and Rallis, 2012) and lived in Brazil, and share the Brazilian national ancestry with the respondents including cultural tenets such as their native spoken language (Portuguese), and the earlier mentioned conceptual framework I bring in the research. Other sources of conflicting positionality situations concerning social roles may surface based upon the perceptions that the respondents and I have from each other’s physical space, social and economic status, symbolic territory (Stringer,
2007) and power (Rossman and Rallis, 2003). The respondents were aware that I was a professional in the academia, that I had knowledge of the field of my investigation, and that I was living in the U.S. since 20 plus years. I noticed that for some respondents these attributes were coming with certain knowledge and social status, and so with certain territoriality that if not properly addressed would limit the sharing of their tacit knowledge so valuable for my research. Very earlier in the fieldwork I learned that keeping some informality, with easy going conversation during the interview, can be an effective way to address this positionality issue.

To address possible misperceptions from the respondents toward me I applied Stringer’s (2007) action research role legitimacy and non-threatening criteria, and ethical procedures. In my role of investigator, I presented myself as a resource person, I informed the respondents about the interview procedures and the purpose of the interview and research, I was aware of my body language and tone of voice and behavior, and held the interviews in places that the respondents felt comfortable. I obtained the IRB’s clearance using these ethical concerns. I produced two original signed informed consents per interview, retained one and handed the second informed consent to the interviewee. The informed consent is shown in figure 6. It informed the interviewee the purpose of the research and its process, what the respondent’s participation in my investigation entailed, the respondent could discontinue the interview at any time during the interview, and that the information provided by the respondent was personal, it will be kept safe, and would not be accessed by others unless with written consent from the respondent.
Figure 6: Informed Consent

You are invited to participate, as a volunteer, in this research. My name is Euripedes De Oliveira, and I am the investigator of this study. I am a PhD student at the University of Massachusetts, my field work is urban and regional planning, and international development. Upon reading the clarifications of the purpose of this study, including what your participation in it will entail, and upon your agreement to participate in this study, please sign at the bottom of this “Informed of Consent” form.

All respondents in this study will be individuals who participated in the program “City for Us”, that was led by the state of Goiás, that took place from 2005-2009. The participant shall be 18 years and older. The purpose of this study is to understand how the respondents addressed the issues concerning land-use and planning through the various workshops and or public hearings held through the program “City for Us”. The knowledge generated from this study can be useful for academics and professionals in the field of urban planning, in both public and private sectors. There is no direct benefit for the participant.

The first group of interviewees will be individuals of my choice, and I will request referrals from them for subsequent additional participants. Your participation in the research will consist of one recorded interview of about 90 minutes that should be held in a place of your choice. The interview entails some open-ended questions concerning the land-use debate that was part of the program “City for Us” that you participated in. You may skip any question that you may feel uncomfortable answering.

I understand that there are no known risks associated with this research; a possible inconvenience may be the time it takes to complete the study. The identity of all participants of this study will be protected, and secured. If the participants of this study are quoted directly their names will not be disclosed to anyone or any form of publication. The research records will be labeled with a code or pseudonym.

If you have further questions about this study project or if you have a research-related problem, you may contact me at (phone #). If you have any questions concerning your rights as a research subject, you may contact the University of Massachusetts Amherst Human Research Protection Office (HRPO) at humansubjects@ora.umass.edu.

Thank you,

Euripedes De Oliveira

I have read this “Informed Consent”, and discussed its content with the investigator of this study. I understand the purpose of this study, the procedures inherent in it, and what my participation entails. I understand that I can resume my participation in it at any time, and without any penalty for doing so.

Participant Signature __________________________ Print Name __________________________ Date __________________________

By signing below, I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy of it.

Signature of Person Obtaining Consent __________________________ Print Name: __________________________ Date: __________________________

(source: Euripedes De Oliveira 2013)
3.3 Integrating Qualitative and Quantitative Data

The phenomenon under investigation in the research is the vulnerability factor built into the land-use practices discussed through the participatory planning process led by the program City for Us. The theoretical framework I bring in the research is built on the premise that vulnerability is factored by interconnected social and biophysical processes (Adger, 2001; Gidley et al, 2009), and that vulnerability studies and assessments have difficulty to combine perceptions of vulnerability and risk with material outcomes from climate and non-climatic impacts (Adger, 2001). For that reason, the vulnerability scholarship explains the relevance of using quantitative procedures to complement qualitative studies of vulnerability. The qualitative literature suggests that a phenomenon can be approached in different ways, and investigated by using multiple techniques in any given study.

The literature presents qualitative researchers as being pragmatics, strategic, and self-reflexives, who combine various interpretive techniques to reach a desired outcome (Denzin and Lincoln, 2003; Lincoln and Guba, 1985; Creswell, 2007; Strauss and Corbin, 1998 cites Creswell, 1994). The qualitative paradigm guiding my research led me to use both qualitative and quantitative data, which are supported by both the social vulnerability framework used in this research, and the profile of qualitative researchers herein mentioned. In preparation for and through the research design prior my fieldwork, I purposely engaged in a comparative analysis while using qualitative and quantitative data drawn from socio-economic demographics, surveys and brochures associated with the program in which the phenomenon under investigation took place.
3.3.1 Data Collection Approaches

Data can be organized via artifacts, events, settings, and acts (Marshall and Rossman, 2006), or at the site, event and or process levels (Creswell, 2007). Interviews are central to the naturalistic inquiry (Lincoln and Guba, 1985; Denzin and Lincoln, 2003; Glaser and Strauss, 1967, Strauss and Corbin, 1998), and they were the main source of qualitative data in this research. The interviews consisted of an open central question such as the following “tell me about your experience as participant of the program City for Us”, and subsequent open-ended questions that allowed me to investigate specific themes and concepts that are tenets of the planning and vulnerability fields. I initiate the interviews with three main topics in mind that included land-use, participatory planning, and vulnerability, and sub-themes such as built and natural environments, risk, hazard, resilience, and climate change. The questions were shuffled during the interviews so I could explore in depth a specific topic under investigation. New topics brought in by the respondents in a given interview were explored in the subsequent ones, which lead me to modify or replace existing theme(s) and or sub-theme(s). These modifications reflected on the interview guide (Appendix J).

The use of interview guide during the interviews allowed me to engage in a conversational mode with the respondents (Rossman & Rallis, 2003) and ensure that the same topics of inquiry were explored in all interviews (Creswell, 2007; Yin, 2009). I was a listener and observer without interfering in the respondents’ answers, and whenever applicable I made use of requests for elaboration of the answers so the respondents could unfold their own thoughts. I learned not only about the respondents’ experiences in the
planning process led by the program *City for Us*, but also from their thoughts about the contribution of other experiences beyond the program.

Reflexive journals (Creswell, 2007) and field notes (Glaser and Strauss, 1967; Strauss and Corbin, 1998; Rossman and Rallis, 2003) have logistical purposes. Journaling took place in the research while I was in the field prior I initiate coding the transcripts. The journals make use of field notes, and assess the reflexivity and methodological aspects of the research. They reveal the context of the interviews, which along the theoretical framework were used to support my interpretation and arguments through the coding and analysis, writing memos, and writing the dissertation. I used reflexive journals to revise and fresh up the themes in the interview guide before I initiate a new interview. They helped me to balance my insider-outsider positionality, and to keep the roles of the respondent and mine from crossing each other. In some instances, the journals were helpful in clarifying themes and events during the transcription of the interviews as well.

The reflexivity element from my journaling was incorporated in the memos (Glaser and Strauss, 1967; Strauss and Corbin, 1998; Saldana, 2013) produced when coding and analyzing data. The memos are theoretical conceptualization tools that hint the relationships between categories that are formulated through hypothesis, and suggest the directions to further the analysis. The time I spent memoing varied accordingly to the theoretical relevance of the categories, and the stage in the coding process in which that takes place. The memoing activity increased and become longer and more theoretically elaborated (analytical) as I moved further through the coding process. The systematic use
of reflexive journaling and memos, and the interview guide contributed to the rigor and trustworthiness of the research findings.

3.3.2 Data Management

The topic of the research and the themes to be investigated are not sensitive or personal, and I did not observe that my research endeavor put the respondents of the interviews in risks or harm’s way concerning their privacy and confidentiality. The respondents were all adults older than 18 years, literate, able to communicate verbally, and were interviewed in a place of their choice. Their participation in the research was limited to individual interviews. The interviews were audio taped, and they will be destroyed within the five years from the date of the interviews. The interviews were transcribed and password secured, and are kept in secured places of my own. The data inventory consists of 19 audio taped interviews totaling 1,241:17 hours, with 65:32 minutes average per interview, and their respective transcripts presented in both electronic and hardcopy format. There are reflexive journals from the first seven interviews, field notes from all 19 interviews, notes done while through the transcriptions of the interviews, and the memos I written through the coding-analysis and writing process. I am the only person with access to the data I produced along the research and may contain identifiable information. Secondary data source includes documents produced through the program City for Us including the master plans of the municipalities of Hidrolândia, Guapó, Trindade, Senador Canedo, Goianira, and Nerópolis (Goiás, Brazil), and community-based assessments of the municipalities of Goianésia, Goiatuba, and Jaraguá. Additional secondary data include the Participatory

Table 1: Data Inventory (source: Euripides De Oliveira, 2013)
The qualitative literature suggests that the choice for sampling strategies is not necessarily determined by a specific epistemology but by the levels of information that the data may provide (Glaser and Strauss, 1967; Strauss and Corbin, 1998; Denzin and Lincoln, 2003; Lincoln and Guba, 1985; Patton, 1999), and so data sampling can be done at random, purposely, or by combining both approaches. My initial sampling strategy was to use the chain/snowball sampling (Stringer, 2007; Creswell, 2007; Patton, 1999) to select the first batch of respondents, and advance data coding and analysis between subsequent batches of interviews. That approach was beneficial to increase my theoretical perceptiveness. However, by the time I completed the first batches of interviews I realized that the availability of and physical accessibility to prospective interviewees was taking most of the time I had initially allocated for my fieldwork. I sooner understood that limited time and budget was the major impediment for me to advance data coding and analysis between batches of interviews. Thus, I had to change my original sampling approach after the first seven interviews. Supported by the argument that the researchers have flexibility to change their sampling strategy (s) while in the research process (Marshall and Rossman, 2006; Creswell, 2007; Lincoln and Guba, 1985; Denzin and Lincoln, 2003; Glaser and Strauss, 1967; Strauss and Corbin, 1998), I used a combination of journaling, chain/snowball sampling, and my learning from the interviews to select the pool of respondents for the interviews. Once I left the field I had completed 19 out of the 20 interviews I had planned initially.

The combined use of the chain (snowballing) sampling, reflexive journaling, and field notes, I did through the first seven interviews was beneficial to determine the
geographical cut for my sampling. As shown in figure 7 the sampling of respondents for my interviews were stakeholders who participated in the program City for Us, and were living within the metropolitan region of Goiânia, the state capital of Goiás, Brazil. The cities include Hidrolândia, Guapó, Trindade, Senador Canedo, Goianira, and Nerópolis.

**Figure 7: Goiânia Metropolitan Region**

As I went through the second batch of interviews I understood that degradation of springs, riparian systems, and local watersheds, was a concern brought up by the respondents. Many of these watersheds feed the Meia Ponte River, shown in figure 8, which is the main regional waterway that serves about 50% of Goiás’ population including many cities within the metropolitan region of Goiânia.

**Figure 8: Meia Ponte River Watershed**
Figure 9 shows the *Meia Ponte River* as one of the many tributaries of Brazil’s largest river basin – the *Parana Basin*, which extended to the *Prata Basin* shared by Brazil, Uruguay, Argentina, Paraguay, and Bolivia.

![Figure 9: Meia Ponte, Parana, and Prata Basins](image)

By the end of the field work the shared characteristics among the cities represented in the interviews consider the fact that all municipalities (1) have a much larger rural than urban areas, (2) local small farmers associations and or cooperatives in some fashion were involved with activities related to the planning process under the program City for Us, (3) their master plans were enacted as municipal law, (4) implemented the federal funded affordable housing program *Minha Casa Minha Vida*, (5) have experienced migration inflow, urban growth, and expansion in the past couple decades, (6) has a significant population working in the state capital Goiânia, and that (7) waterways from five municipalities join the *Meia Ponte River* watershed.

### 3.3.3 The respondents

The general argument in the qualitative research literature (Lincoln and Guba, 1985; Denzin and Guba, 2003; Glaser and Strauss, 1967; Strauss and Corbin; 1998) suggests that it is not a matter of quantity but the quality of the data that determines the
richness and quality of the research. All respondents were in some fashion directly involved with the participatory planning process led by the program City for Us. The pool of respondents included two program coordinators, one program manager, two field technicians who provided support to the community working groups (WG’s) whom represented their cities in the program, and 14 WG members. The composition of the WG members include one interviewee from each Hidrolândia, Guapó, and Trindade, two from Nerópolis, three from Goianira, and four from Senador Canedo. All interviewees participated in workshops held in the state capital, public hearings held in their respective cities, and other activities led by the program City for Us. Many respondents indicated that generally their lack of familiarity with the terminology and jargon used by the program’s coordination and field technicians, and professionals in the planning field, was not an impediment for them to engage and advance their viewpoint. They used their life experiences and own communication skills to articulate the various urban and planning themes discussed through the planning process.

The heterogeneity amongst the respondents increased as I moved from the more homogeneous and small groups made of program’s coordination and field technicians, to the larger and more diverse group of WG members. The heterogeneity between and within groups of respondents concern one’s role in the implementation of the program City for Us, gender, levels of education, household income, political affiliations, if the respondents were urban or rural dwellers, and one’s exposure to risk and hazardous impact caused by socio-economic uncertainties, and vulnerability to climate variability and change. Even taking in consideration the participatory framing of the planning process there was hierarchy within and between the WG’s. That concerns the decision-
making power associated to one’s accessibility to information and technology, representation within the local, state and federal spheres of the public administration, and leaderships within the community that the program participant represented.

3.4 Research Credibility

Prior to addressing the credibility of my research, I visited the works of Glaser and Strauss (1967), Strauss and Corbin (1990, 1998), Patton (1999), Pyett (2003), Wolcott (1994), Stringer (2007), Creswell (2007), Eisenhart & Howe (1992), Yin (2009), Srivastava and Hopwood (2009), Rossman and Rallis (2003), and Chavez (2008). Patton (1999) suggests that the credibility of qualitative inquiries should indicate (1) rigorousness of the techniques and methods applied in ones’ research, with attention to the validity, reliability and triangulation, (2) the credibility of the researcher associated to her/his background, knowledge and presentation, and (3) a philosophical belief and appreciation of qualitative methods and holistic thinking. To increase the quality of the research the inquirer is advised to use different methods of inquiry, and to keep the data and findings within the context (Patton, 1999) that the phenomenon takes place. The main purpose of my investigation is not to provide precise evidence of a theory systematically generated from the qualitative data, but to suggest a theory that explains it (Glaser and Strauss, 1967; Strauss and Corbin, 1998; Creswell, 2007). Patton’s criteria used for credibility of qualitative data can be applied to the research findings as it concerns validity, reliability, the use of secondary data via triangulation, and philosophical belief. I further illustrate the validity and the use of secondary data.
The validation of the dissertation findings was manifested in many ways. For example, in the constant comparison process, validity increased simultaneously with the coding and data analysis. Through this process validation manifested as internal validation, in which the systematic identification of the relationships between categories (concepts) created hypothesis, and validates them against existing and new data. The second instance is the external validation, when comparing similarities and differences between core concepts from data generated from the interviews with concepts from secondary data originated from the literature. In the aftermath, the joint coding and analysis process of systematically recording the theoretical ideas suggested by the hypothesis in memos, can contribute to the validity of my research findings.

The trust in the diligence and integrity of the investigator relies on the write-up process by display of the respondents “honesty, reflexivity, discipline and rigor” (Pyett, 2003). Patton (1999) maintains that the obligation of qualitative researchers to methodically report detailed data and the research process, and that the reader needs details and context to assess the researcher’s interpretation and trustworthiness. The use of the reflexive journals and field notes, along with the literature were paramount to support the interpretation and arguments through the writing up of the dissertation (Strauss and Corbin, 1998). The rigorous protocol and the preparation of the interviews (Creswell, 2007; Stringer, 2007; Wolcott, 1994) including the interview guide, the reflexivity within the journaling, memos, and field notes assure the validity of the research findings and its implications to the respondents’ communities.
3.5 Applying the adopted CCM coding techniques

The coding was done in three phases. I used the “structural” coding technique in the first coding phase which was a preliminary phase of the coding process, wherein the researcher identifies key themes or concepts as starting point to advance a more in depth analysis of the raw data (Strauss and Corbin, 1988; Saldaña’s, 2013). The “eclectic” approach, which the author suggests resembling Glaser’s and Strauss’ (1967) original “open coding, combines the “descriptive”, “in vivo”, “process”, and “values” coding techniques. They are recommended for exploratory qualitative research that engages multiple participants, and uses various sources of data and semi-structured interviews.

When using the “focused” coding technique, which Saldaña (2013) suggests resembling Strauss’ and Corbin’s (1998) axial coding, I looked for the frequency of codes, with the purpose of developing and expand the categories I perceived to be more relevant to my research. This was also a process of integration of categories. The first coding phase is presented in sub-section 3.4.1. The “eclectic” and “focused” techniques were used in the second and third coding phases, which are presented in sub-section 3.4.2.

3.5.1 The Participatory Planning, Land-Use, and Vulnerability Data

Segments

The structural coding was a basic level coding technique I used in the first phase coding, which was a preparation to advance a more in depth coding and analysis in the two subsequent coding phases. The data used was drawn from the first interview’s transcript. Saldaña (2013) suggests this technique is appropriate for qualitative
exploratory research that uses semi-structured interviews. The author explains that structural coding is a question-based approach that labels and indexes large sections of data corpus that relate to a given question used in the interview, and it can be used to build list of topics, initial categories, or themes. The aim in the first coding phase was to become familiar with the content of the first interview’s transcript. Even more so to weight the key topics “participatory planning”, “land-use”, and “vulnerability” presented in the research question.

I glimpsed through the transcript once, and proceeded coding the data corpus in a second reading of it. There is no need for margined entries when using structural coding (Saldanâ, 2013). I used the electronic Word version of the first interview’s transcript to code it, and developed a color coding. For purpose the data corpus I identified three large data segments, in which the predominant themes were the three key topics of the research question. The topics “participatory planning”, “land-use”, and “vulnerability”, were each assigned a large data segment. Because of the interconnectivity amongst these three topics there was no clean cut between the data segments, and none of them had complete domain over its large data segment. From applying the structural coding technique in the first transcript I learned that the participants involved in the community-based planning, under the program City for Us, held different perspectives and knowledge of participatory planning, land-use, and vulnerability subjects. I understood that these subjects were three dynamic individuals but interconnected processes encompassed by a larger planning process, which was advanced through the program City for Us.

When going through the data corpus I observed the repetition of data passages (incidents) which consisted of words, phrases, sentences, and paragraphs (Glazer and
Strauss, 1967; Strauss and Corbin, 1998) that I perceived to be analytically appealing and linked to the topics participatory planning, land-use, and vulnerability. These passages suggested other meanings associated with the three topics of the research question that caught my attention. I kept those meanings in mind when going through the second coding phase. The concepts participatory planning, land-use, and vulnerability held broad breadth. They were used as starting point (Glazer and Strauss, 1967; Strauss and Corbin, 1998) or provisional concepts (Strauss and Corbin, 1998; Saldanã, 2013) in the second coding phase.

3.5.2. Data Coding and Analysis

In this sub-section I code the first interview’s transcript to illustrate the three stages of the adopted CCM, and the intertwined data coding and analysis process. The adapted CCM I used in the research follows Glaser and Strauss’ (1967) classical constant comparative analysis (CCM), which involves three interactive stages, wherein the preceding stage prepares the subsequent one. The stages entailed the comparison of incident to incident, concept to more incidents, and then comparison of concept with concept (Glaser, 1978). Before long in the coding process the stages started occurring simultaneously. Thus, earlier in the coding process I was concurrently comparing the incidents I had identified earlier amongst themselves and against new ones, comparing concepts I identified earlier against new incidents, and comparing concepts amongst themselves and to new ones.

I initiated the interview with the three guiding topics of the research question in mind, which are participatory planning, land-use, and vulnerability. The interview started
with the ice breaking question “tell me about your experience as participant of the program City for Us”, and subsequent open-ended questions that allowed me to investigate specific themes and concepts suggested in the interview guide, which concerned the built and natural environments, risk, and hazard. These topics, themes, and concepts are tenets of the planning and vulnerability fields.

• COMPARING INCIDENTS with INCIDENTS: I commenced coding the interview’s transcript comparing incidents with incidents, while looking for actions, feelings, expressions, words, phrases, and sentences in the incidents, to determine their similarities and differences (Glaser and Strauss, 1967). Once I identified a concept of relevance to the subjects under my investigation, I wrote it on the margins of the paper and highlighted the incident on the text. The concepts varied in meaning, and the labels given to them were either expressed directly by the respondent (in vivo) or suggested by the context in which the incidents took place (Glazer and Strauss, 1967; Strauss and Corbin, 1998; Saldanā, 2013). Here, I used Saldaña’s (2013) “descriptive”, “in vivo”, “process”, “values”, and “focused” coding techniques.

The concepts varied in meanings. For visual and cognitive purpose once I identified a concept of relevance within a given data context, I placed it in a hierarchical diagram. The hierarchy was based on the breadth of the concept I identified, and whenever applicable I wrote analytical memos explaining the rational and mechanics used for selecting a given concept from the data. By the end of the second coding phase I had put together a diagram (Appendix K),
wherein the concepts were placed hierarchically whether a category, property, or dimension. The hierarchy did not necessarily follow the original place the concepts as shown in neither the data corpus, nor the chronological order in the coding process they were identified. For instance, I identified the concept productivity in the data corpus before the concept capacity building, yet later in the coding process capacity building (as category) was placed higher in the hierarchy than productivity (as property).

- CODING for CATEGORIES (democracy, “involvement”, and mobilization): I initiated coding the participatory planning data segment with the concepts of participation and learning in mind. I opened the interview inquiring the responded about her experience in the planning process (case study) I was investigating. She concluded her answer emphasizing her (and others) experience of democracy in the planning process. In the follow up question I asked her to clarify the meaning of democracy in the context of her experience. She started the answer linking democracy with the involvement of others in the planning process, which I explored in a subsequent follow up question. At certain point in her answer she made references to the mobilization strategy used to get stakeholders and community members at large involved in the planning process. Thus, the follow up question explored the meaning of mobilization in her experience. From my initial and follow-up questions exploring the concepts democracy, involvement, and mobilization, I identified the concepts intensity, incredible, seduction, experience, productivity, democracy, engagement, capacity
building, participation, participatory methodology, empowerment, mobilization, convincing, strategy, belief in reality change, and the in vivo concepts “involvement” and “incredible. At that point in the interview I understood that this range of concepts was indicative of the large breadth (an abstraction) of the concepts democracy, “involvement”, and mobilization. For the time being I coded these concepts into three distinct categories.

Categories are broad abstractions that house various concepts (meanings). They have analytical power since they “have the potential to explain and predict” a social process while answering to the question “what is going on here” (Corbin and Strauss, 1998). Generally, the identification of categories was in many ways like the process used for the identification of concepts. The categories are social constructions that I conceptualized from the data, like the concepts democracy and mobilization. They can also be in vivo codes like the concept “involvement”, which was a concept drawn directly from terms and expressions used by the respondent. The categories are given broad conceptual labels to better handle and articulate their concepts when comparing them with new incidents (Glaser and Strauss, 1967; Strauss and Corbin, 1998; Saldaña, 2013).

- CODING for PROPERTIES and DIMENSIONS (mobilization/motivation, seduction, convincing, replication, belief in reality change, outcomes; democracy/participation): When coding a new incident, I compared its similarities and differences with previous incidents under the same category, and as the constant comparison of incidents advanced it soon generated properties and
dimensions. The properties are attributes given to concepts (Straus and Corbin, 1998), and the dimensions were the range and variations of the properties. They are conceptual fundamentals of the categories that increased their generality and so the applicability of a category to more than one incident (Glaser and Strauss, 1967).

From constantly comparing incidents with incidents earlier in the coding process, I identified the concepts democracy, “involvement”, and mobilization, and coded them into categories. Concurrently to that I also identified the concepts intensity, incredible, seduction, experience, productivity, engagement, capacity building, participation, participatory methodology, empowerment, convincing, strategy, belief in reality change, and “incredible”. In the process of identifying concepts I understood that these concepts and new ones could serve as properties of the categories democracy, “involvement”, and mobilization. Case in point, the concepts motivation, seduction, convincing, replication, belief in reality change, and outcomes, were placed as properties of the category mobilization. I placed the concept participation as propriety under the category democracy as well. In doing so it increased the applicability of the categories mobilization and democracy to more incidents. I expected that these arrangements would eventually change as I continued coding additional data. For instance, the category “involvement” was eventually re-coded as dimension of the property participation.

The categories and properties (and dimensions) are inductions from the data while the generalizations of their relationships are deductions carried through
my hypotheses, which were generated not too long in the coding process. I used simultaneously multiple hypotheses to verify new incidents and concepts, and the building up of the relationships between the categories and properties lead me to theoretical ideas (Glaser and Strauss, 1967). I wrote memos about the theoretical ideas suggested by the hypothesis, which were generalizations of the relationships between existing concepts – categories and properties, and their dimensions (Glaser and Strauss, 1967; Strauss and Corbin, 1998). Once a concept was identified more than three or four times I would write a memo discussing the data passage.

- INTEGRATING CATEGORIES (that hold exploratory supremacy): When applying Saldaña’s (2013) “eclectic” coding approach I used the author’s “descriptive”, “in vivo”, “process”, and “values” techniques to explore and fracture the data drawn from the interview transcripts into bits that explained meaningful concepts within it (Strauss and Corbin, 1998). These bits were telling me parts of the phenomenon I was investigating. Once I started clustering these bits they gained broader explanation power of the social process under investigation (Glaser and Strauss, 1967). At that point in the analysis process I was going through the third stage of Glaser’ and Strauss’ (1967) and Glaser’s (1978) constant comparative method, with emphasis in comparing concepts amongst themselves. Here, I used Saldaña’s (2013) “focused” coding technique to integrate the core categories I have coded so far through their properties (and dimensions).
The integration of core categories led me to more robust theoretical ideas, which resulted in the supremacy of some categories over others. Case in point, when inquired about the respondent’s experience in the participatory planning process (phenomenon) the respondent shined light on the overall experience of democracy she and other fellow participants had in the overall planning process. At certain point the respondent’s assessment of the program was that the democratic experience they lived through was priceless. Bearing that in mind I integrated the categories democracy and emotional experience, labeled the new category democratic experience and placed the properties participation and emotions as its properties. The dimension involvement and engagement were placed under the property participation, while the dimension intensity and “incredible” were placed under the property emotions (emotional experience).
CHAPTER 4

RESEARCH FINDINGS

I investigated the participatory planning process, under the program City for Us. The phenomenon under investigation is the vulnerability element built in the discussion advanced by the program participants through the planning process. The research aims to answer the question “How do land-use practices discussed in participatory planning process relate to vulnerability, and what does this mean for how vulnerability can be relevant in other participatory planning processes? The key guiding topics of the research question are “participatory planning”, “land-use”, and “vulnerability”. This chapter presents the research findings, wherein I look for the many references to participatory planning and land-use made by a selected number of the participants of the program City for Us, wherein it concerns processes, practices and governance-equity issues. The chapter presents five elements of relevance to participants of the program that I identified in the interviews, which include participation, mobilization, learning, governance, and vulnerability.

The chapter introduces five broad themes including Democratic Experience, Mobilization Capacity, Learning Capacity, Governance and Equity, and Planning for Vulnerability via Participatory Planning. Section 4.1 presents the participation element through the themes participation through involvement and further engagement, emotional experience, and capacity building workshops to explain the theme Democratic Experience. The second broad theme Mobilization Capacity Gradient is introduced in Section 4.2. Here I share with the reader the mobilization approach used by the participants of the program City for Us, which include the themes mobilization through
persuasive rational-ideological argumentation, empowering mobilization, mobilization through reflexivity, and mobilization capacity gradient.

The learning methodology pertinent to the interviewees’ experience through the planning process is discussed under the broad theme \textit{Learning Capacity Gradient} in Section 4.3. The themes under this section include \textit{pedagogy, learning, and learning capacity gradient}. Please note that the first three Sections are under the topic “participatory planning”. The themes \textit{governance, equity, and sustainability perspectives within participatory planning processes} is presented under topic “land-use”, in Section 4.4. This section discusses the co-relation between governance, land-use, and sustainability, while introducing the themes \textit{participatory land-use assessment} and the \textit{distributional issues from land-use policies}. The themes \textit{laypersons’ understanding of socioeconomic and environmental vulnerability, vulnerability to climate variability, the social vulnerability perspective in housing, vulnerability to political constraints, coping strategies to overcome political constraints, adaptability to political constraints in participatory planning processes, and empowerment leads to vulnerability}, are discussed under the broad theme \textit{Underlying Vulnerability Element in Planning Processes and Practices}, under the topic “vulnerability”, in Section 4.5.

\section*{4.1 The Democratic Experience, and the Learning and Mobilization Capacity in the Program City for Us}

I opened the interviews with an ice breaking question where I inquired the respondents about their experience in the planning process, under the program City for Us. Whenever the respondents had a moment of hesitation answering that first question I
suggested them to tell me anything about their experience in the program. Some answers were longer than others, yet at certain point in the interviews they indicated some content while pointing to the democratic element built into the planning process. However, this was not the general tendency in the interviews which generally was influenced by the respondent’s familiarity with the question’s subject, and by the phase in the planning process the subject was related to. Those considerations are further presented in the section under the topic “land-use”, and more so under the subsequent topic “vulnerability”. From the answers to my first question the respondents often pointed to the democratic element built in the participatory planning process they experienced. Since new questions were based on the answers from the preceding ones, it allowed me to further explore democratic elements of the respondents’ experience in all interviews. The data suggest that the democratic experience of the WG’s, and by the communities at large, was linked to levels of participation in the program City for Us. There is a co-relation between participation and their involvement and mobilization through the planning process. In this section I explore this co-relation while presenting the capacity building workshops the WG members participated though the duration of the program City for Us.

4.1.1 Participation through Involvement and further Engagement

The participatory planning literature suggests that involvement and engagement are two forms of civic participation, and that a distinction should be made between these two forms of participation in democratic processes. With that in perspective I re-visited the data corpus and observed that in fact the intensity (levels) of community participation
varied. The subject under discussion (e.g. sustainability, housing, safety) in the planning process, the actors and their interactions (e.g. field technicians and WG’s, WG’s and their community, WG’s members amongst themselves), and the outcome from these interactions were indicative of whether involvement or engagement took place. I would say that engagement was more related to individuals that in some fashion participated in the capacity building workshops, either through the coordination and management of the program City for Us, or its field technicians and the Community Work Groups (WG). The involvement element of participation generally related to state and local representatives and to stakeholders from the community at large, which included attendees of public audiences held by the WG in their hometown. The two levels of participation are presented in the following excerpt. The respondent was a WG member for the city of Senador Canedo.

There were two versions of the WG’s (for this city). I participated in the second version. The first version was a group made of a significant number of people, and most these people neither involved themselves in the work (Program City for Us) or participated in the workshops (capacity building workshops). There were representatives from some city agencies, and city council’s office, including some city council themselves. So, there were people from the executive and legislative branches of the local government, and civil society ... like presidents of community associations, some NGO’s, and many of them did not get involved... they held the first meetings, initiated the land-use assessments, then stopped (participating)... I believe it was because of how the work was systematized, the time (allocated to it) since it was not a work to be done in few weeks; it would take longer.

“O GTC de Senador Canedo ele foi formado duas vezes. Eu participei da segunda versao do GTC. A primeira versao do GTC era um grupo com uma grande quantidade de pessoas, e a maioria dessas pessoas nao se envolveram no trabalho e nem participavam das oficinas. Sim, representantes de algumas secretarias da prefeitura, representante dos vereadores, inclusive alguns vereadores. Entao tinham pessoas do poder executivo, legislativo, e liderancas comunitarias tambem. Tipo presidente de associacoes de bairro, ONGS, alguns representantes de algumas ONGS porue o municipio tem varias delas. Entao tinha pessoas tanto do poder executive, legislativo,quanto da sociedade civil, e
4.1.2 Capacity Building Workshops

When making references to the methodology used in the participatory planning process the respondents pointed to the monthly workshops, held through program City for Us. The workshops were places of knowledge building where academics, professionals, and WG members, looked at the urban dynamics through the socioeconomic and infrastructure lenses. They shared life experiences and scientific knowledge, and took “ownership” of the built knowledge with the main purpose of developing master plans.

At the first glance the element capacity building applied to the various activities advanced through the participatory planning process under the program City for Us. These activities included individual meetings of WG’s with the program’s coordination, field technicians, local public hearings, and the WG’s field activities, among others. The outcome from these various activities were discussed and worked through during workshops held in the state capital. The most tangible end-products from these workshops were the community-based assessments and master plans developed by the WG’s. The former led me to consider that the workshops were the catalysts of opinion forming and decision making. Thus, for purpose here I kept the element capacity building specifically when it relates to the workshops.

When in the workshops the WG’s had access to various types of information (e.g. data census, state and national studies) often generated by local, state, and federal public agencies and non-profit research organizations. The workshops were source of...
information for the WG’s who disseminated it when passing on this information to their communities. The data also suggested that in various circumstances the element information was relating to the actions of WG members, when accessing and using information to produce knowledge, while sharing this knowledge built with the community. Once back to their hometowns the WG’s held public hearings, and shared with the community the land-use issues discussed in the workshops, and how these issues related to their daily lives. In the occasion WG members discussed their fellow attendees the many ways in which the master plans could address the problems they were experiencing, and on the relevance of community participation in the planning process. Following the public meeting WG’s organized and discussed among themselves the content of generated through the public hearing, and brought in this information to be shared with other WH’s in the following workshop. The following excerpt was drawn from the response of a female respondent, from the city of Guapó, in which I inquired her about the relationship between her WG with stakeholders. Here, I shine light on the process of knowledge building through the process of acquiring and producing information.

“Once we (WG) attended the workshops (capacity building workshops) we learned (about planning related subjects) and how to work with stakeholders in public hearings. We started the land-use assessment prior to the first public hearing. So, by the time we held the first public hearing we have presentation materials we had produced ourselves, video (to guide us) in the implementation of and to improve our public hearings, we knew what and how to discuss (planning subjects), and how to lead the public hearings; sometimes we were not prepared though. This is because we (WG) were discussing something that we lived, something that was ours, from our municipality, and that we knew.”

“Nos do GTC iamos, fazíamos oficina, aprendíamos como trabalhar com isso, mas na realidade nos nao sabíamos que quando a gente trouxesse, que começasse a audiencia publica, que haveria novidades, coisas novas que a gente estava preparado para aquilo (mas) e as vezes nao estávamos. Então a gente ia,
estudava o material, e trazia. Nos tínhamos vídeos para implementar e aprimorar nossa audiência pública, e quando nos fizemos a leitura do município, a leitura comunitária, que nos levantamos os pontos históricos da cidade, buscamos a fundo, então nos tínhamos realmente uma bagagem para discutir nas audiências públicas. Porque a gente estava discutindo uma coisa que a gente viveu, uma coisa que é nossa, que é do nosso município, que a gente conhece.”

The capacity building workshops included sessions led by guest speakers from both academia and professional fields, discussion of methodologies to access and gather information from layperson and public archives, outcomes from public hearings held by WG’s, development of the community-based assessment, and elaboration of master plans, among others. The data passages leading me to the element capacity building workshops, suggested that the element information in fact referred not only to passing on (via “word of mouth”) the information learned through the workshops and public hearings. This was a mutual, gradual and evolving learning process, wherein WG’s and their home communities learned that planning was complex. With that in mind, I contemplate that the workshops were end-product oriented, and places for information getting, production, and dissemination, wherein scientific and layperson’s knowledge were exchanged and used through the development of community-based assessment reports, and eventually of master plans. Though this learning process, and at different stages in the planning process, the WG members advanced their understanding of the neighborhood-city interplay, and some more than others could think about planning within a regional perspective. Case in point, when considering the socio-economic and environmental realm of their cities within the metropolitan region context, which they shared with the state capital Goiânia. The following excerpt illustrates the regional approach used by various WG’s, wherein they placed their land-use discussion beyond
their municipality’s borders and within Goiânia metropolitan region. Here, I draw the excerpt from a female WG member from the city of Guapó.

“... we are a dormitory city. Guapó (the city) has not sufficient job for its population, so our population seek for job in the capital (Goiânia). We face this problem while being neighbors of the state capital. We feel like that. Is there where our people work, and is there where (they) earn the money, is there where our people spend the money, and is here in our city that our people voice their discomfort. If they look for medical treatment it is in our municipality that they have it, they also bring disease and violence from the capital. There is also the issue with leisure because the municipality is small and close to the (state) capital so we observed these issues. The subject we discussed the most in the public hearings was about ways to bring more industries to the city so to increase job opportunities in the municipality... I believe that the municipalities you (researcher) are interviewing (in the metropolitan region) are bringing to your attention the same issues we are facing (here), where it concerns dormitory cities and that they want a better job, a “city for us” where we can have better housing, and to live better.”

“... somos uma cidade dormitorio. Guapó nao tem especificamente trabalho suficiente para a sua populacao. Entao, a nossa populacao ela busca na capital isso nao e? E a gente, nos sofremos esse problema de vizinhancas com a capital. A gente sente isso. E la que o nosso povo trabalha, e la que o nosso povo ganha o dinheiro, e la que o povo gasta o dinheiro, e e aqui na nossa cidade, que o nosso povo traz a questao de desconforto, se procura (esse povo) tratamento de saude e no nosso municipio, tambem questao de doencas tras-se para ca, questao de violencia, essas questoes. E tambem a questao do lazer porque o municipio e tao pequen e proximo da capital que a gente observou isso. O que que a gente mais observou isso - quando nos faziamos todas as audiencia publicas o que era-se discutido era a questao de aumentar a questao industrial para a gente trazer empregabilidade no municipio.... eu acredito que voce deve estar ouvindo isso, que os municipios do entorno devem dizer a mesma coisa da questao da cidade dormitorio, que eles querem mais conforto economico no municipio. Que eles querem um trabalho melhor la onde eles moram. Uma cidade pra gente, que tem tudo pra gente, que a gente pode morar melhor, e viver melhor.”

When coding for processes, I looked for action-interaction and consequences, and emotions of the respondents themselves and stakeholders involved in the planning process they made references to. While through the planning process, the stakeholders’ actions were tactical, casual, repeated, original, and or conscientious actions that
suggested situations of struggle, negotiation, and adaptation. These situations were expressed through emotions and expressions like marvelous, intensity, energy, seduction, incredible, “goose pumps”, and “little monsters”. Within the context shown in the data segments these expressions were associated to a given passage experienced by the field technicians, and by WG members and the communities they represented in the program City for Us. The expression suggested excitement, curiosity, disappointment, and mistrust, among others. For instance, when inquired about their experience in the program City for Us the respondents shined light on the democratic experience they had through the participatory planning process. Toward the end of the interviews a good proportion of the respondents indicated that although the master plans they developed might have not fulfill the expectations of many in their community, on the other hand the democratic experience they lived through the planning process was priceless.

4.2 Mobilization Capacity Gradient

In this section I introduce the mobilization approach (s) used by the coordination of the program City for Us, the field technicians, and WG members. I present their mobilization strategy through the lenses of empowerment and reflexivity, which are suggested in the interviews. The intent here is to keep the breadth of the two interactive elements empowerment and reflexivity inherent to the mobilization process experienced by the program participants.
4.2.1 Mobilization through Persuasive Rational-Ideological Argumentation

The data suggested that the mobilization approaches used by program coordinators, field technicians, and WG members, varied along the planning process. However, they carried two major motivational arguments to convince and recruit community “gate keepers” to participate in the program City for Us. The first argument consisted of informing local administrations about the federal law embodied in the “Statute of the City” (2001), and its mandate that required certain category of cities to have master plans. Federal funding for urban development purposes like infrastructure and housing projects would be denied otherwise. I conceptualized this first argument as rational. The second argument was the “belief in reality change”, which leans toward the ideological element paramount in participatory planning practices. Based on both arguments I contemplate that the program coordinators, field technicians, and WG members, made use of persuasive rational-ideological argumentation to mobilize and recruit prospective participants for the program City for Us. I further explore the empowerment and reflexivity elements inherent to the mobilization approach used in the program. The following excerpt illustrates the rational-ideologic driven mobilization used throughout the planning process. It was drawn from the interview of a female field technician.

“... we contacted (prospective participants) via phone calls yet we were able to “seduce” them (local representatives, stakeholders) ... this is a good word (to use) because at the same time we were convincing people based on financing (federal funding) implications... we also used an additional strategy we were not aware about it... It was a kind of energy coming from the program’s director, that it would make us believe that we could mobilize people. We used the
telephone the whole day sometimes the call last 40-50 minutes... we (field technicians) had arguments to convince people that they had to participate in the workshops (capacity building workshops) because it was information they could use to convince people in their municipalities to work (join the program) ...I noticed that when we succeeded (in recruiting WG members) the WG’s replicated it (outreach approach) with other people (stakeholders from their communities) ... at first they were suspicious because we valued them (their participation), we observed that their self-esteem was at its high, but we had good feedback from using our mobilization approach.”

“... a gente fazia o contato por telefone mas a gente conseguia seduzir as pessoas... esta e uma palavra boa porque ao mesmo tempo que convenciamos a spessoas pela questao financeira ... a gente tambem usava de uma outra estrategia que a gente nao sabia disso... era uma energia que vinha da Silmara. Ela fazia a gente acreditat que podiamos mobilizar estas pessoas. A gente pegava o telefone o dia inteiro as vezes a ligacao durava 40-50 minutos...a gente tinha arguments para convencer as pessoal que elas tinham que participar desta oficina de capacitacao porque era informacao para que eles pudessem inclusive conseguir convencer as pessoas do municipio deles a trabalhar... eu percebia que nos lugares que dava certo eles replicavam isto com as outras pessoas.... no começo tinham uma certa desconfianca porque a gente valorizava muito as pessoas, a gente sentia que a auto estima estava muito valorizada, mas dava retorno, dava retorno (resondent’s emphasis).”

4.2.2 Empowering Mobilization

The data corpus suggests the field technicians learned from the program coordination to mobilize existing WG members, or when outreaching for additional members. Once WG members learned this mobilization approach they replicated it in their communities, with the purpose of increasing the participation of the community at large in the planning process that took place via public hearings held in their hometowns.

Based on my observations during the interviews and the data segments, many respondents shined light on the political empowerment and the growing sense of citizenship amongst the participants involved and further engaged in the planning process. Their enthusiasm decreased though when making references to the self-interest of some GW members. These individuals took advantage of their status as WG member,
and used knowledge acquired from their short-lived participation in the planning process, to gain political capital. In those cases, their political capital was opportunistically used for electoral purposes, and or to obtain job promotion in local and state offices and agencies, and to influence city planning decisions that could benefit developers, individual properties, or specific neighborhoods in town. Whenever political capital was used for self-serving purposes instead of strengthening the democratic planning process, through governance improvement and equity, it impacted the morale and productivity of WG members, while undermining their mobilization. Here, I perceive mobilization as process and empowerment its outcome. The mobilization amongst participants of the planning process, more so WG members, entailed actions and interactions wherein the outcome empowerment was a consequence manifested through their gain of political capital. Although mobilization is the catalyst for empowerment they evolve and build upon each other. The more mobilized the WG members and the community at large were the more politically empowered they became. This relationship led me to I integrate the mobilization and empowerment elements, and label it empowering mobilization. The empowerment resulting from mobilization is illustrated in the following excerpt, where the interviewee responds to my inquiry about the participation of community associations in the public hearings. The respondent is a male member of the city of Inhumas’ WG.

“We have the “Association of Serra Baixo Producers”, and there is other association here in the “Quilombo” region. So, they were associations that had some infrastructure, and they became stronger than before (participate in the program City for Us). Nowadays they are capable to obtain machines (and other equipment) thorough federal means. I do believe in the effectiveness of mobilization. When an organization mobilize in pursuit of its revindications it is not in behalf of one person but of the whole region, since the revindication is from many of them. I think that in a situation like this the public representative, the
politician, do not act but react to the association’s revindication. There is that saying that “if nobody complained everything is right” (respondent smiles).

“A gente tem a associacao dos produtores do “Serra Baixo”, tem uma outra associacao aqui da regiao do Quilombo. Entao foram assim umas das associacoes que tinham uma certa infraestrutura e elas conseguiram se fortalecer mais ainda. Sao associacoes hoje que elas conseguem maquinario atraves de recurso federal... Eu acredito muito no aspecto de mobilizacao. Quando se tem uma organizacao que ela se mobiliza e que vai atras a reivindicacao nao chega so em nome de um, e de toda uma regiao, sao de varias pessoas. Entao, eu acho que nesse processo ai o gestor se preocupa mais porque a gente comeca a perceber que parece que o gestor, o politico, ele nao age ele “reage”. Entao tem aquela questao assim se ninguem reclamou esta tudo bem (respondent smiles).”

4.2.3 Mobilization through Reflexivity

From further investigation of the mobilization approaches used by the field technicians, and more so by WG members, I understood that generally these approaches were convincing to the point of motivating stakeholders to participate in the program City for Us. In fact, the more persuasive these arguments were the more convinced and motivated the WG members were to mobilize their communities. These arguments were provocative, and stimulated WG members into reflexivity - critical thinking and learning about their reality. The reflexivity within WG’s varied accordingly to their composition, and in many circumstances, it was conditioned to the support provided by local administrations (mayors, city council) and or local businesses and farmers. I concluded though that the mobilization approach I was coding succeeded while recruiting additional WG members, and the community at large, whom became involved, and further engaged in the planning process. I understood that the reflexivity inherent in their learning process, wherein WG members and the community at large could observe, understand, and explain their reality, was also empowering. In that context, they became more critical to and perceptive to how their lifestyle and quality of life was related to their
accessibility to health, housing, mobility, public safe, education, job opportunities, and public space, among others. Thus, urban life was complex. The following excerpt was drawn from the interview of a male field technician, and it exemplifies the evolving mobilization process looked through the lenses of reflexivity.

“To mobilize stakeholders) was not an easy process. That was because to say to the community that you will involve them in urban planning was not appealing to them. If were a theme linked to housing, health, maybe we have had a larger involvement (in the earlier stage of the planning process). It was a work that started slowly. We had to identify “gate keepers” in the community, and convince them to help the community to see in which way they were an element of urban planning, to observe and reflect which aspect of health, housing, transportation, and public safety, had direct influence on their lifestyle, and quality of life. So, urban planning is more complex than we can imagine, it is more complex than the development of roadways. Urban planning considers health, education, public safety, transportation, jobs, leisure... Once the community start seeing the relationship between all these elements of planning, they see themselves as part of the planning process because they see that through urban planning they are capable to improve the health, education, mobility, and public safety related services. At that stage, the community become interested in urban planning because they see themselves as part of the planning process; they recognized their needs in that process.

“(mobilizar a population) Nao foi um processo muito facil, a principio voce dizer para uma certa comunidade que voce vai envolve-la num planejamento urbano, em principio nao e um tema que e muito chamativo principalmente na nossa cultura. Se fosse um tema ligado a habitacao, a saude, talvez a gente teria um envolvimento muito maior. Foi um processo que se iniciou vagaroso, foi um trabalho de convencimento, teve que ser identificado alguns atores strategicos. Nos tivemos que convencer da importancia da comunidade participar no planejamento urbano, e fazer a comunidade perceber de que forma que ela esta inserida no planejamento urbano, e refletir que os aspectos da saude, da habitacao, do transporte, da segurança publica influenciam diretamente no seu modo de vida, and na sua qualidade de vida por que isto e muito mais complexo do que a gente imagina; o planejamento urbano e mais complexo do que o arruamento; ele (planejamento urbano) e muito alem disso (arruamento) ele (planejamento urbano) envolve a saude, a educacao, a seguranca, o transporte, o trabalhar, o lazer. Quando ele comecce a ver todo esse macro todo esse processo ai ele comeca a ser inserido nele porque ele percebe que através do planejamento urbano ele consegue melhorar o serviço de saude, servico da educacao, servico de transporte, segurança publica ai ele se interessa, porque ai ele se reconheceu naquele trabalho; ele reconhece as suas necessidades.”
While looking at cities through a holistic perspective, WG members generally understood the relevance of community participation, and their individual and community roles to be played in the planning process. Through reflexivity they found themselves as agents of transformation while foreseeing many challengers ahead, with certain skepticism however. The goal was to change the reality they dislike based on shared “ideal living conditions”. I contemplate though that a growing sense of community came along, when WG members and their community learned firsthand about urban planning and master plans, and engaged in the participatory planning process. This also points to the reflexivity within the capacity of the WG’s to mobilize, and to observe, understand, and explain their realities. Since the WG members mobilized through reflexivity over their reality, I understood that event as a critical learning experience through reflexivity. Here, I shine light on Paulo Freire’s critical learning and thinking, and consciousness (“Pedagogy of the Oppressed”, trans. 2005), which is paramount to participatory planning schemes.

4.2.4 Mobilization Capacity Gradient

The element mobilization was identified as an empowering process, and the outcome from reflexivity. That suggested a close relationship between mobilization, reflexivity and empowerment. It seems though that empowerment (see empowering mobilization) and reflexivity (see mobilization through reflexivity) are determinant factors in the WG’s capacity to mobilize (see vulnerability, copying strategy). I contemplated then that the higher was the stakeholders’ reflexivity about their reality more mobilized they became, and through the mobilization process the stakeholders
empowered themselves. The former led me to contemplate that the participants’ capacity to mobilize gradient was influenced by the oscillation of the stakeholders’ reflexivity over their reality, and the empowerment (e.g. political capital) gained through their mobilization. To better explain the participations’ mobilization capacity though the planning process I combined the empowering mobilization and mobilization through reflexivity perspectives and labeled it mobilization capacity gradient. While doing so I was looking for how governance issues associated to socioeconomic pressures and institutional constraints (e.g. political, cultural) relate to the stakeholders’ reflexivity and their empowerment.

4.3 Learning Experience

Earlier I introduced the element mobilization capacity gradient. I shared with the reader that the field technicians and WG’s learned to mobilize, and developed mobilization strategies in their outreach initiatives. They also learned firsthand how to observe, understand, and explain their reality, so they learned from being reflective over their reality which propelled their mobilization. The data suggested that learning to mobilize and learning to be reflective were empowering, and determinants of their capacity to mobilize. In this section I introduce the element learning and its weigh in the participatory planning process, and in the aftermath.

4.3.1 Pedagogy

A couple respondents brought up to my attention the element pedagogy in their responses, which in the data passages I conceptualized as the learning methodology used
in the participatory planning. The context within the data passages suggested that the pedagogy used in the program City for Us concerned *how and what to learn* in terms of stakeholders’ participation in the planning process. The data indicated in many ways that the program was inclusive and held a diverse pool of participants based on gender and occupational terms, socioeconomic levels, to name a few. Case in point, among the field technicians there were educators and recent graduated architects with no experience in planning and no exposure to participatory processes. The program involved and in many circumstances engaged stakeholders from all walks of life including professionals, academics, and scientists mainly from the urban geography and architecture fields, and mayors, council persons, and cities’ head of departments yet mainly from the departments of education, and health fields. The largest group of participants consisted of community leaders mainly from urban areas, then high school students, and rural area dwellers.

### 4.3.2 Learning

Five out of six technicians working in the program City for Us had completed their college degree in architecture, yet they had limited or no knowledge about planning and master plans, and so the WG’s. I interviewed two field technicians and the manager of the program, who along most of the WG members I interviewed had no experience in participatory planning. The WG members who participated in my interviews were familiar with their neighborhoods, and generally knowledgeable about some aspects of the city they lived in and represented in the program. From the responses in my interviews I understand that through the capacity building workshops the program manager, field technicians, and WG members, learned from each other. The WG’s
passed on their learned knowledge to their communities, mainly through local public hearings. The participation of students in the public hearings held by the WGs’ varied. The following segment, drawn from a female respondent, illustrates the participation of students in one of the public hearing held by the town of Nerópolis’ WG.

“... many teachers attended public hearings to inform themselves.... some teachers took group of students to participate in a couple public hearings for them to learn about, and or to understand the planning process... we (WG) took the public hearings to a couple public high schools... because students at that age range, principally the students that attended evening classes, they do not change... in accordance with the federal law they have better discernment, and they are at the age of voting (16 years and older) ... that is how we were thinking too, and to how convey to them what master plans were about, its relevance... while being appreciated, they (students) were part of this process (planning) which at that time was unique in the municipality.”

“The respondents shared with me that in fact the field technicians and WG members “learned while doing it”. The element “learning” was expressed by the respondents during the interview, yet less explicitly by few WG members I interviewed. It was for me an indication of the relevance of the element learning to the respondents’ narrative of the planning process they experienced. Within the contexts presented in the data the element “learning” suggests a collective, mutual, gradual, and evolving process, which was manifested in the interviews through expressions like “learning how to read the city”, “learning along the way”, “learning while teaching”, “learning as end
products are completed”, and “learning how to explain”. The breadth of the concept learning in the data passages, and its relevance to the participants’ learning experience in the planning process became clearer as I moved through the coding and analysis of additional data. Noteworthy to point out the relevance of the element learning to the many themes suggested in the interviews, whether the topic being covered at that point in the interview concerned participatory planning, land-use, or vulnerability.

4.3.3 Learning Capacity Gradient

The participatory methodology used in the program City for Us enabled field technicians and WG’s to participate in learning and knowledge building processes. The data suggested that the effectiveness of the pedagogy (the way one learns) carried through the participatory planning process could be determined by the levels of participation (involvement and engagement) of the field technicians and WG’s, and how and what they learned by the end of the planning process. With that in mind, and since the overall level of participation (involvement and mobilization) amongst and within the WG’s oscillated through the planning process, I re-labeled the element pedagogy as learning capacity gradient.

As I pursued coding for the topics “land-use” and “vulnerability”, I kept in mind the many meanings suggested in the element learning capacity gradient. In doing so I looked for variations of elements like participation, inclusion, and diversity that could impact the WG’s learning experience in the participatory planning process. I also had in mind the many meaning suggested by the category mobilization capacity gradient, when looking for oscillations of the WG’s mobilization through the planning process. Here, I looked to their reflexivity over reality, and gaining or loss in their political capital. Until
now the element vulnerability has not been a defining element of the categories mobility capacity gradient and learning capacity gradient and. However, this scenario changes in Section 4.4 wherein I discuss the increasing vulnerability of the WG’s as they advance in the planning process.

### 4.4 Governance, Equity, and Sustainability Perspectives within Participatory Planning Processes

In this chapter I present the many circumstances in which governance issues, associated to socioeconomic pressures and institutional constraints (e.g. political, cultural), are factors causing oscillations on the WG’s capacity to mobilized; they were less so in their capacity to learn because of the advanced stage they were in the planning process. As I further investigate the processes leading to governance-equity issues, the ways in which socioeconomic pressure and institutional constraints influenced land-use practices and policies, caused urban expansion, and the socioeconomic and environmental vulnerability of the human and natural systems resulting from these processes.

#### 4.4.1 Participatory Land-Use Assessment

When inquired about the land-use discussion carried through the planning process, quite often the respondents made references to the activities advanced through their workshops and the end-product from these activities delivered by the WG’s. Some, more emphatically than others, pointed to the inclusiveness and diversity elements within the composition of the WG’s, and the benefits (learning) from their participation in the
community-based assessments. Throughout the making of these assessments WG members engaged in an evolving learning process, which included workshops and field activities. The methodology applied through the development of the community-based assessment included field activities, wherein WG’s outreached various sources to collect and organize data. When in the field, they mapped current land-uses in their communities, while linking existing land-use policies to the problems they were facing and potentialities of their cities. WG members learned firsthand the socio-economic and environmental implications from existing land-use practices, in both urban and rural areas within their municipalities. They observed and interviewed various community members and public representatives, and accessed public archives. Through this learning process WG members built knowledge while acquiring new skills, and producing or assimilating information. The end-product of these community-based assessments was the map-based reports, wherein the WG’s identified and discussed the problems and potentialities of their cities based on the various land-uses they mapped when in the field.

4.4.2 Distributional Issues from Land-Use Policies

There was consensus amongst the interviewees that generally the economic prosperity they (and WG’s) observed, when in the field, had more negative than positive impacts on their socioeconomic and environmental realms. Their responses suggested there was a general understanding amongst WG’s and the community at large, that the benefits from economic prosperity were limited to certain groups. These responses provided me leads indicative of governance, equity, socioeconomic issues, and political constraints in the land-use discussion, and so through the overall planning process. They
mentioned that in many circumstances through the land-use debate, the economic prospective of a given city turned into a problem once examined through the socioeconomic, environmental, and equity perspectives. Although sustainability was intrinsic in the respondents’ land-use narratives when making references to conservation and preservation of the environment, the word sustainability itself was spoken less than I was expecting. In those cases, I brought it in the conversation to provoke the respondent to use it, whenever she or he was making references to land-use policies, economic prosperity, social services, and environmental conservation. Some respondents more than others were quite critical to the uncontrolled expansion of the urban perimeter they were experiencing in their cities, and pointed to the socio-economic and environmental implications from urban expansion to the wellbeing of their communities.

Table 2 suggests that public concern with the environmental implications from urban expansion was not limited to the participants of the program City for Us, but also a concern of stakeholders nationwide. The table was drawn from the 2008 national survey done by Brazil’s Ministry of the Cities/CONFEA-CREA, which surveyed participants of community-based planning that were advancing the national urban development policy. The survey identified 23 planning priorities related to the planning process the surveyed participants were experiencing, and to land-use issues to be addressed by the master plans they were developing. Goiás is one the three states forming the Midwestern region of Brazil. The four main priorities identified for the Midwestern region, Goiás, and municipalities with population range from 20,000 to 500,000 inhabitants, concerned environmental protection, infill urban voids (leap frog), limit urban perimeter, and public participation in the planning process.
Table 2: Planning Priorities

<table>
<thead>
<tr>
<th>Assessment and Monitoring of the Democratic Master Plan (DMP)</th>
<th>Goiás State</th>
<th>Pop. of Up 20K</th>
<th>Pop. of Up 50K</th>
<th>Pop. of Up 100K</th>
<th>Pop of Up 500K</th>
<th>Mid-W Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Protection</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Limit Urban Voids</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Limit Urban Perimeter</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Attendance Pub. Audiences</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Ministry of the Cities/CONFES-CREA (2008)/ Euripes de Oliveira, 2017

In many cases sustainability was not seen as a potential but as an economic problem, even when a given area had economic potential when preserving them in their natural condition. The respondents mentioned that many saw that as a problem since WG’s members had to negotiate the public interest with individuals holding political, and or economic interests. Discussions between WG members and mayors could be contentious whenever the subject was areas of preservation, like springs or areas that could compromise the cities’ sources of fresh water. There were situations where these areas were not adequate for housing or industrial development. Nonetheless, mayors and city representatives would argue that they had previous political commitment to bring infrastructure, housing projects, or develop industrial parks on these areas. There was strong advocacy from speculative landholders for the expansion of the urban perimeter, whether by keeping urban vacant lots from being developed (leapfrog), or through subdivision of productive farmland or pristine areas that had not been zoned as protection area yet. The struggle faced by the city of Trindade’s WG, when advocating for the environment, is illustrated in the following excerpt.
“...the subject environment did not get good traction with the community... only people that had more awareness about the environment like teachers, or individuals that were more directly impacted by environmental related issues mobilized while concerned with that ...it was mostly a preoccupation from the urban population. That was when the game of interests amongst interest groups was more evident. For example, some developers tried to bring people connected to them to participate in events, with the purpose of advocating for the idea of development, and that without mention the attempts of these individuals to go around consolidating agreements. We could see some developers seeking (lobbing) for direct influence from council members, the mayor, and local city’s department heads, in the decision-making process. Things like that upset us because we were advancing a collective and transparent process, while there were people trying to go around this process with eyes on their personal interest.

So, in many circumstances environmental related issues were marginal in the planning discussion, and whenever we would take a position on that we were taken as radicals against development. We were aware that a given entity (arguing for expansion of the urban perimeter) had a subdivision that was impacting springs that provide fresh water to the city.”

“...a questao do meio ambiente ela era uma coisa que nao mobilizava muito.... so uns setores assim, pessoas mais esclarecidas, professores, pessoas que eram mais afetadas (se mobilizavam)... seria bem mais uma preocupacao da populacao urbana. E ai ficava claro o jogo dos interesses. Por exemplo, alguns loteadores tentavam colocar pessoas ligadas a elas para participar dessas coisas, para defender o “conceito” de desenvelvimento entendeu? E nos tivemos alguns, e sem contar as tentativas de acordos por fora. Algums loteadores procurando vereadores, procurando o prefeito, procurando secretarios. Coisas assim que deixava a gente indignado porque se agente estava fazendo um processo coletivo transparente, e as pessoas querendo burlar esse processo, com vista ao seu interesse pessoal. Entao, essas questoes do meio ambiente elas muitas vezes ficaram marginais dentro da discussao, e quando a gente se posicionada era vista como radicais, como alguém que era ate contra o desenvolvivemento, e umas historias assim muito engracadas. E a gente sabe que tem um loteamente, a entidade tem um loteamento – aquele de interesse social que pasmo nao e? Era feito em areas de nascentes nao e? areas de nascentes foram soterradas. Nascentes que alimentariam o corrego que abastece a cidade, e que essas nascentes foram soterradas.”

Based on the interviews public representatives held strong position that the current urban perimeter should be expanded to accommodate their political commitments. There were cities that withdraw their participation in the program City for Us for that reason. Situations like that led to lengthy and sometimes confrontational
negotiations, which the WG’s were not quite prepared for. A couple respondents suggested that in one of these confrontations a WG member received death threat. However, my understanding from the interviews is that confrontation was not the overall tone of the land-use argumentation between WG’s and public representatives. A couple respondents suggested that the accessibility to information was paramount for them whenever dealing with these contentious situations. The information in question was produced and gained by the WG’s through the development of their community-based land-use assessments, and their participation and knowledge exchange in the capacity building workshops. Here, I quote a respondent who weighs the relevance of the element information in the planning process “we empowered the WG’s providing them with information”. Some respondents indicated that they learned to think about medium and long-term planning solutions though their participation in these negotiations. The following excerpt was presented earlier in section 4.1, it shines light on one of the possible strengths of capacity building workshops, while it illustrates the relevance of acquiring and producing information for the WG’s to cope with the pressure, from political and economic interest groups, when the subject land-use was discussed in the capacity building workshops. Although it needs further investigation I consider that this excerpt illustrates the accessibility to information be approached as source of empowerment.

AL... Once we (WG) attended the workshops (capacity building workshops) we learned (about planning related subjects) and how to work with stakeholders in public hearings. We started the land-use assessment prior to the first public hearing. So, by the time we held the first public hearing we have presentation materials we had produced ourselves, video (to guide us) in the implementation of and to improve our public hearings, we knew what and how to discuss (planning subjects), and how to lead the public hearings; sometimes we were not prepared
though. This is because we (WG) were discussing something that we lived, something that was ours, from our municipality, and that we knew.

“Nos do GTC íamos, fazíamos oficina, aprendíamos como trabalhar com isso, mas na realidade nos não sabíamos que quando a gente trouxesse, que começasse a audiencia publica, que haveria novidades, coisas novas que a gente estava preparado para aquilo (mas) e as vezes não estávamos. Então a gente ia, estudava o material, e trazia. Nos tínhamos videos para implementar e aprimorar nossa audiencia publica, e quando nos fizemos a leitura do municipio, a leitura comunitaria, que nos levantamos os pontos historicas da cidade, buscamos a fundo, então nos tínhamos realmente uma bagagem para discutir nas audiencias publicas. Porque a gente estava discutindo uma coisa que a gente viveu, uma coisa que e nossa, que e do nosso municipio, que a gente conhece.”

4.5 Indigenous Groups’ Experiences Inform Planners and Policy Makers About Climate and Non-Climate Vulnerability

The findings presented in the previous section suggest a direct relation of land-use practices and policies with vulnerability, where it concerns processes leading to governance-equity issues, social-economic forces influencing land-use practices and policies triggering, and urban expansion, which result in socioeconomic and environmental vulnerability. In the following section I further investigate the relationship between land-use and vulnerability. I explore how governance associated to socioeconomic pressures and institutional constraints (e.g. political, cultural) factor in the variations of the WG’s capacity to mobilize (mobilization capacity gradient), and their learning experience (learning gradient) through the planning process.
4.5.1 Layperson’s Understanding of Socioeconomic and Environmental Vulnerability

The term vulnerability was seldom used by the respondents, until I brought it in the conversation later in the interview. This term was not easily articulated by them, yet in many data passages it was an underlying element when land-use policies and practices were the subject being addressed. When asking some respondents what would be the equivalent to vulnerability, they suggested that it would be the WG members’ overall perception of and references to land-use practices resulting in situations of risk and hazard impact. Although the words vulnerability, risk, and hazard themselves were not used by the interviewees with the frequency one would expect, in many circumstances they were identifiable in their responses and in various data passages. Case in point when WG members explored the interconnectivity between urban infrastructure and services, housing, ecosystem services, and environmental conservation and preservation.

The data suggest that they informed themselves about risk and hazard when participating in the workshops. Once in the field developing their community based assessments they mapped the various land-uses county wise. They also mapped the areas where land-use practices were creating situations of risk and hazard to their communities. Their findings from the field work was discussed in the subsequent workshop, while further discussing key socio-economic and environmental implications from their communities’ exposure to and sensitivity to the risks and hazards they were facing. I understand that in some fashion the WG’s developed qualitative and or quantitative indicators for or linked to risk, hazard, exposure, and sensitivity, when in the process of developing their community-based assessment, and their master plans. A further
investigation through additional interviews, archives, and artifacts are necessary to verify if they produced quantitative data.

The terms exposure and sensitivity were seldom used by the interviewees and WG’s. Some respondents also made references to the exposure and sensitivity of the communities at large (including WG’s) to risk and hazards, when linking them to the impact of the fast pace deforestation in their home state for growing crops or raise cattle. They made references to the impact of the ongoing change in land-use and land-cover on riparian areas, springs, and watersheds, to the overuse of soils through consecutive plantation cycles, and to the use of agro toxics. The exposure of human and natural systems and their sensitivity to risk and hazards was also related to the disposal of the empty agro-toxic containers with chemical residues, and of syringes used for cattle vaccination nearby riparian areas and springs.

Through the community based assessments and capacity building workshops the WG’s assessed existing land-use practices and policies that enabled situations of risk and hazard. They contemplated plausible solutions with the purpose of decreasing the vulnerability of various communities and natural systems at risk, and with propensity to hazards impact. These solutions entailed alternative land-use policies, which were re-assessed along new ones being created as the planning process advanced. The WG members explored the interconnectivity between social programs and housing, as well as the impact of deforestation and pollution on both the environment and human systems.

The following excerpt was drawn from responses of a female WG member, who describes the relocation of low income dwellers living in a risk area, within the municipality of Senador Canedo. Her description suggests the elements vulnerability,
risk, hazard, and exposure-sensitivity. This passage also suggests the locality’s comprehensive approach to planned adaptation to address risk and hazard impact, while avoiding the likelihood of some disaster.

“... to learn (through participatory planning process) in the program City for Us to plan the city, and taking this planning and discuss it with the city stakeholders, allows you to use (land-use) assessment to identify the problems and (the) areas more vulnerable in the city. Once these vulnerable areas, or risk areas as we say here, we identified the “Bico de Pato” community who were living in the proximity of high tension transmission lines. With the support of the “defesa civil” our municipality convinced the community to move out from the area. Houses were built specifically for these dwellers of these risk areas. The Brazilian “Ministério Público” (Public Ministry) followed up the process of relocation, while establishing deadlines to complete the relocation of the families from these vulnerable areas. At that time, it was recommended that the relocation place be in an area close to the location the community lived before, where two housing complexes were built. All families were provided with social workers, they received orientation, and attend environmental education activities; the relocation has been completed.”

“...aprender no programa CfU a planejar a cidade, e levar esse planejamento, discutir esse planejamento com a comunidade e com a população em geral, ele permite que ao se fazer os levantamentos você identifique os problemas e as áreas mais vulneráveis. Mas detectando essas áreas vulneráveis, essas áreas de risco, o município fez um trabalho que convencesse as pessoas que mudassem desse local. Para isso foi construído casas especificamente para esses moradores dessas áreas de risco. O ministério público chegou a participar acompanhando todo esse trabalho dando prazos para que ele fosse realizado, para que essas famílias fossem retiradas dessas áreas vulneráveis, e hoje elas já estão morando. E a recomendação da época era que fosse numa área próxima onde eles moravam, e foram construídos dois conjuntos habitacionais e todas essas famílias sao acompanhadas pelas assistente sociais da secretaria, sao orientadas, tem as palestras de educação ambiental, e elas já foram retiradas.”

4.5.2 Vulnerability to Climate Variability

Where it concerns climate vulnerability the respondents made references to climate variations. Their answers suggested that generally their home state (Goiás) was not impacted by climate variability as much as other states in the country. However,
some respondents suggested that in their state farming was the activity most impacted by climate variations. They made references to the increased cost of agricultural goods, and shared that there has been increase of plague on soy bean plantations. The increase of droughts has impacted agricultural outputs, and consequently the state’s export of commodities like beef, soy bean, ethanol, and sugar, which are a main economy of the state. Through the planning process some WG members talked about water shortage, and that existing artesian wells were running dry. Even though, I understand that generally water shortage was not a general discussion amongst the participants of the program City for Us, or a focus point in the WG’s planning agenda. Moreover, from a couple respondents I understood that many folks in the state of Goiás do not believe still that they can face water shortage.

4.5.3 The Social Vulnerability Perspective on Housing

As suggested earlier, the term vulnerability was not used with frequency either by the interviewees, or in the land-use discussions advanced by the field technicians and WG’s in the planning process. However, it was implicit in their land-use discussion when exploring the interconnectivity between urban infrastructure and services, housing, ecosystem services, and environmental conservation and preservation. The WG’s discussion about housing vulnerability was an evolving process built on their daily life experiences, and the professional-academic knowledge brought in the land-use discussion by the program coordination and field technicians. Housing vulnerability was initially
approached by WG members as individual household problems, while linking shelter quality to its physical structure and amenities.

As the planning process advanced the housing problems gained a holistic perspective, where housing quality was no longer limited to shelter structure and amenities, instead it was also determined by the quality and accessibility to the overall urban infrastructure, public services, mobility, and job opportunities. The socio-economic pressures associated to the fast pace of demographic changes experienced by middle and small size cities, were also taken in consideration more so when that concerned circular migration. There was a consensus amongst the interviewees that when looking through their holistic perspective their housing problems were no longer approached as individual but collective problems, wherein the solutions were to benefit the community at large. At that point in the planning process accessibility to housing was discussed as a matter of citizen rights. The WG’s understood that communal solutions required mobilization of the community to overcome their limited power to influence local decision-making and policies. In the following excerpt a female member of Guapó’s WG shares her understanding of social vulnerability, wherein she links house density with vulnerability.

“Regarding social issues where it concerns violence and housing, while in the field one aspect I made sure to observe concerned the children, and the fact of many children living in the same house. It is a matter of values, cultural values, and moral values too, the increase of - how a would put it – let’s say the increase of domestic violence. The fathers having to go looking for job, and the mothers leaving the house for the same reason, and we observed that the violence would grew for the absence of their parents. That is the reason why we often heard (in the public hearings) about housing issues. They often put emphasis on housing, where we relate to it as home ownership yet they used their own language while saying “we need our (own) house”. A four-rooms (house) to accommodate ten individuals was too small – don’t you think? So, we often saw that, principally in
the periphery of the city where it seemed to be most vulnerable while experiencing more social vulnerability."

“Na questão mesmo social – violência, a questão de uma coisa que eu observei muito durante o caminhar e principalmente que me chamou muita atenção com relação à criança, uma casa assim com muitas crianças, muitas pessoas morando numa casa só. A questão até de valores, valores culturais, e valores morais também, a violência, o crescimento da – como eu posso colocar – o crescimento da violência familiar digamos assim. Os pais tendo que ir buscar emprego, mães também deixando os seus lares também porquê disso, e a gente observava, e a gente observava que a violência crescia nesse sentido. Por isso que a gente ouvia muito falar na questão habitacional. Eles frizavam muito a questão habitacional, (que) a gente tem que ter a casa própria, mas o que eles falavam numa linguagem deles mesmo – ‘‘agente precisa da nossa casa’’. Por exemplo, uma casa de 4 cômodos acomodando 10 pessoas era muito pequeno não é?

Então, a gente via muito isso, principalmente na parte periférica da cidade onde parecia que tinha mais impacto social, onde que a gente percebia mais vulnerabilidade la.”

Based on the holistic perspective brought in their discussion of residential land-use, the field technicians and WG’s were taking in consideration other land-uses associated to their social, economic, and environmental realms. Some interviewees more explicitly than others suggested that in fact once the issues within their social realm were properly addressed, the problems they were facing in both economic and environmental realms would had been addressed though social (and political) measures. The discussion of housing vulnerability in the planning process evolved from an individual to collective problems that required collective actions and solutions. In hindsight, since the field technicians and WG’s identified the various land-uses enablers of their housing problems, and addressed their housing vulnerability through a holistic perspective while constructing their meaning of land-uses for housing quality, I considered that in fact housing vulnerability concerns both climate and non-climatic vulnerability.
4.5.4 Vulnerability to Political Constraints

The constraints imposed by political and economic interest groups through the planning process influenced the land-use discussion, which in some cases led to land-use policies that favored political agendas and the interest of developers and landholders. Whether not influencing the making of a given land-use policy directly, they would create loopholes in the master plans to curtail the effectiveness of the policy. A couple respondents who were former WG member suggested that while holding hidden allegiance to developers, public representatives took advantage of these loopholes soon after the master plan had been enacted as municipal law. The political constraints imposed by local representatives like mayors and council members often obligated WG’s to extend and postpone the conclusion of tasks pertinent to the community-based assessment reports and master plans, while incurring additional costs to their already tight budget.

It is a consensus among the interviewees that the political constraints experienced through the duration of the program City for Us, impacted the program’s morale, and psychologically impacted the program coordination, field technicians, and more so WG members. Some interviewees pointed out the financial and psychological vulnerability experienced by various WG members through the planning process, wherein for political reasons some mayors defunded the whole WG, or replaced more active WG members with new ones whom could better advance the mayors’ political agenda. For these reasons, I a considered that the WG’s vulnerability to political constrains can be perceived as non-climatic vulnerability.
Coping Strategies to Overcome Political Constraints

The theme capacity building workshops was previously coded under the topic “participatory planning” as places of knowledge building where professionals, academics, WG members, and community stakeholders looked at the urban dynamics through its social and infrastructure features. They shared life experiences and scientific knowledge, and took “ownership” of the built knowledge with the main purpose of developing community-based assessment reports and master plans. I made a point earlier that the most tangible end-products from these workshops were the community-based assessment reports and the master plans developed by the WG’s. With that in mind I contemplated that these workshops were catalysts for opinion formation and decision making.

My findings from the coding under the topics “land-use” and “vulnerability”, suggested that the capacity building workshops were also places wherein WG’s developed mobilization strategies to overcome the pressure from conflicting interest groups. In the aftermath, I understood that the capacity building workshops were multi-purpose events. My understanding from the interviews was that generally the process of strategizing their mobilization was re-energizing, motivating, and “empowering”, which was paramount to overcome problems while keeping their perspective of having a more “ideal city”. The WG’s were constantly re-inventing their mobilization strategies to deal with the political constraints and economic pressure imposed by local, regional, and even state interest groups.

A couple interviewees suggested that the WG members were more emphatic when suggesting that they were always trying to catch up with political schemes from
opposing individuals and groups. Thus, no matter how empowered WG members were
element vulnerability was a constant condition they faced through the planning process.
The data indicated that toward the end of the second phase through the final of the third
phase of the program City for Us, their mobilization had moved from being preventive to
a reactive strategy to cope with their vulnerability to the political constraints and pressure
from landholders and developers.
CHAPTER 5

DISCUSSION OF THE RESEARCH FINDINGS

The program City for Us was a window of opportunity for community stakeholders to experience a democratic process, wherein they learned to mobilize around land-use and participatory planning. With that in mind I discuss the themes “Democratic Experience”, “Mobilization Capacity Gradient”, and “Learning Capacity Gradient” in Section 5.1. I discuss the WG’s learning experience, and the rational-ideological argumentation they used to mobilize and involve community stakeholders in the program City for Us. The discussion in Section 5.2 focuses on the theme “Urban Expansion link to Vulnerability”, under the topic “land-use”. This is a transition point wherein the discussion of the research findings moves from the topic “participatory planning” to “vulnerability”. In this section I discuss the relationship between land-use and vulnerability, while exploring the link between urban expansion and climate and non-climatic vulnerability.

Section 5.3 presents both themes “Governance and Equity” and “Underlying Vulnerability Element in Planning Processes and Practices”. In hindsight, the two previous sections set up the context in which the phenomenon vulnerability, under investigation in the research, takes place. The discussion in this section contemplates the first part of the research question, which inquires “How do land-use practices discussed in participatory planning process relate to vulnerability?”. In Section 5.4 I discuss the relevance of participatory land-use assessments when planning for climate change adaptation. Here I use the vulnerability framework drawn from a selected literature, and data originated from the transcripts. For triangulation purpose, I also use publications of
studies related to the case study of this investigation, and artifacts used through the planning process under the program City for Us. Here, I contemplate the answer of the second part of the research question, wherein it inquires “what does this mean for how vulnerability can be relevant in other participatory planning?”.

5.1 The Democratic Experience, Critical Learning, and Mobilization Capacity, Paramount to Participatory Planning Processes

The program City for Us was implemented through participatory methodology, founded in a process of capacity building and integration of a range of stakeholders including local public managers and administrators, community leaders, and professionals from the fields of geography, pedagogy, health, education, and architecture, to name a few. The cities participating in the program were represented by community workgroups (WG’s) enacted through municipal decrees. The fact that planning is not an independent field of study in the country, that the Statute of the City was the first national urban development policy that set the parameters for land-use practices advanced via local master plans, may help one to understand the relevance and implications of such national policy and the state-led participatory programs such as the City for US. Since then there has been a cultural shift of layperson, public administrators, professionals, and academics, and the perspective change where it concerns urban development and planning.

The paradigm shift was observed throughout the interviews whenever the respondents made references to the participatory methodology carried through the planning process, and their learning experience as it concerned the urban planning
subject, and the participatory planning methodology. The concepts of master plan and participatory planning were generally new terrain for both the WG’s members and to a certain extent for many of the City for Us coordinators, which was composed of college graduates in different fields. It is noteworthy that the general comments from the program coordination illustrated how little they knew, and how much they learned from the WG’s about the cities of their state. I consider that both field technicians and WG’s learned how to exam the dynamics of their city, and which aspects of the city to consider when elaborating master plans.

Therefore, I am inclined to say that the pedagogical component in the participatory process, the WG’s learning, motivation, and mobilization, were values often conveyed in their first answer. With that said, I am not suggesting that this was the general tendency throughout all the interviews. In fact, the tone would vary depending on the respondent’s experience of the subject of the question, and on the phase in the program implementation it was related to. Those were noticeable “red flags” that I investigated as I advanced through the interview. Much of that, which was not an underlying element in their responses, had to do with power structures, self-serving individuals within the WG’s, and mistrust. However, from my perspective, much can be learned from those observations about the community-based adaptation processes experienced by the WG’s, and practical adaptation (Smit and Wandel, 2006).
5.2 Linking Urban Expansion, Sustainability, and Climate and Non-Climatic Vulnerabilities

The *Cerrado* is the predominant landscape in the state of Goiás. The fragmentation of its habitat in the past decades has been the outcome of fast urbanization, and the various land-uses that came along with urban expansion. More specifically, the fast pace of change in land-cover with the expansion of croplands commodities like soy, maize, extensive cattle raising, and more recently, sugar cane (Carvalho et al, 2009). Global technology and other global processes have redistribution implications on socio-ecological systems, and the combined political-economic interventions and the use of advanced technology in the production of agro-commodities has impacted human and natural systems (Sawyer, 2008) at large scale. Non-climatic changes such as demographic, socio-economic and technology may increase the exposure and vulnerability of human and natural systems to climate variation and change. The aim of the WG’s and other community stakeholders was to address the socioeconomic and environmental implications from the fast pace change of land-uses and land cover, resulting from the fast pace urbanization in the *Cerrado*.

Some respondents suggested that in hindsight, the element sustainability was a cross-cutting discussion theme in the planning process, and that it occurred whenever they associated different land uses like housing, transportation, public services, and infrastructure, with environmental conservation and protection. The program “City for Us” set the parameters for local urban sustainable development statewide, yet sustainability did not advance it in their agenda until late in the planning process. At that
phase in the planning process the WG’s had produced their community-based assessment report, and participated in various capacity building workshops. They were familiar with various land-use practices in their communities, and aware of the socioeconomic and environmental implications from urban expansion. At that late stage of the program the WG’s understood the need for upgrading existing land-use policies to contain the urban perimeters of their cities, and that should be reflected in their master plans.

Most respondents suggested that to argue in favor of environmental protection and conservation with local farmers, representatives from both executive and legislative government branches, land holders, and with developers, was very difficult because the concept sustainability was not fully understood by many participants of the program. It was not so easy to advance an argument under the sustainability agenda, principally when it related to environmental conservation and protection. It was time consuming, required strategy, and would require considerable negotiation between the WG’s and local representatives, land holders, and developers, whom by choice had very low representation through the planning process including in local public hearings. These situations could be confrontational, and indicative of the WG’s vulnerability to political constraints. I consider that in the aftermath the participants of the program “City for Us” were not able to articulate a sustainability narrative, or chose not to engage in contexts wherein sustainability was to be discussed.

Although the word vulnerability was not often spoken by the participants of the program City for Us, the concept vulnerability was an underlying element when the planning discussion concerned land-use practices leading to situations of risk and hazard. This concept could also be found in the participants’ sustainability arguments to address
the socioeconomic and environmental implications of urban expansion. My understanding from the interviews is that generally the community at large was more concerned with socioeconomic matters than with the environmental implications from urban expansion. A few respondents asserted that somehow the environmental implications from urban expansion would be addressed concurrently with public policies that address the socioeconomic determinants of their vulnerability to risk and hazard impact. That led me to contemplate that the socioeconomic and environmental factors are dimensions of social vulnerability.

5.3 Program City for Us: The Underlying Vulnerability Element built into the Planning Process, and Land-Use Policies and Practices

The phenomenon under investigation is the element vulnerability built into the land-use discussion advanced by community stakeholders, who participated in the participatory planning process under the program City for Us. Bearing that in mind the discussion of the research findings focuses on the program participants’ understanding of how socio-economic forces and institutional constraints influenced the land-use discussion through their participation in the planning process, and how it relates to their vulnerability where it concerns to risk and hazard impact. The discussion carried through the preceding Sections 5.1 and 5.2 shined light on the indigenous knowledge, and set up the context in which the phenomenon vulnerability, investigated in the research, takes place. These two sections communicate that laypersons’ difficulty in fully or actually articulating abstract concepts, is not an impediment for them to identify, observe,
understand, and use life experiences and their own words to pass on indigenous knowledge about land-use and climate and non-climatic related subjects.

From my coding and analysis of the interviews I developed five broad themes. The first is the *mobilization capacity gradient*, where I looked for the variations in the WG’s capacity to mobilize through the planning process. Here, I looked to their reflexivity over reality, and the gaining or loss in their political capital (power). The second theme is the *learning capacity gradient*, for which I looked for variations of elements such as participation, inclusion, and diversity, that could influence the WG’s learning experience in the participatory planning process. Section 5.3 introduces the *governance and equity issues* and *underlying vulnerability element in planning processes, policies, and practices* themes, wherein the interconnectivity between the three topics participatory planning, land-use, and vulnerability, is clearly observed. In this section I investigate the relationship between variations in the WG’s capacity to mobilize and participate in the planning process, with climate and non-climate vulnerability factors. I will be looking for elements from the two broad themes developed in the previous two sections.

5.3.1 Responding to Political Constraints in Planning Processes

The capacity building workshops were catalysts for opinion formation and decision making, and their end-products were the community based assessments and master plans. The capacity building workshops were places where the WG’s shared and developed mobilization strategies to overcome the political constraints imposed by local representatives. The workshops were multi-purpose events wherein the WG’s were
constantly re-inventing their mobilization approaches to deal with the political constraints and economic pressure imposed mainly by local, and less so by regional, and even state interest groups. The data suggested two mobilization strategies they used to overcome situations alike, in which mayors defunded the WG’s or replaced more active WG members with stakeholders who could advance their political agenda. One approach was to strategically recruit self-supporting community members that had technical skills (GIS, Arc) to replace the WG member dismissed by the mayor. Other mobilization approach was advanced by the replaced WG members who continued collaborating with the WG’s. In that case, the former WG member mobilized neighborhoods and the community at large to participate in the public hearings and other planning activities held by the WG’s in their hometown. When using these strategies, the WG’s were in fact adapting to political constraints. These strategies seemed to increase their capacity to adapt to the impact resulting from constant political pressure, wherein WG’s could be defunded or more active WG members replaced by community leaders that best fit their political interests.

However, the persistency of mayoral actions through the planning process gradually undermined the WG’s resilience, and consequently their capacity to adapt to the impact from mayoral pressures and other public representatives. That might be partially explained on the basis that by the third phase of the program City for Us, the coping strategies were generally more reactive then preventive measures to political constraints, which consisted of some mayors’ maneuvering and actions de-funding WG’s or replacing individual WG members. In my coding for vulnerability I realized that by the third and final phase of the program City for us, the WG’s mobilization strategy had
not been sufficient to derail the constant political pressure of some mayors and other local administrations. I understood then that the WG’s were not necessarily adapting to the political pressure. Yet their coping strategy was more a form of adaptability to the impact of the political constraints faced by the WG’s.

5.3.2 Uncertainty, Resilience, and Non-Climate Vulnerability in the Participatory Planning Process

The data suggested that the WG’s vulnerability experienced in the planning process was factored mostly by local political constraints. In those cases, a couple mayors defunded the participation of WG’s in the program City for Us, or replaced more proactive WG members with new ones that could better serve political and economic interest groups. By the last (third) phase of the program, when writing their master plans the WG’s were empowered with information and were conscious about their citizen rights, yet generally they were aware of their limitations where it concerns their mobilization in their hometowns. At that phase in the planning process, many respondents lacked confidence. They were uncertain if their mobilization back home would be enough to have their master plans accepted by the city council, and more so be enacted as municipal law. It is my understanding from the interviews and state and federal website that in compliance with the Statute of the City, and the Brazilian Ministry of the Cities, by the end of 2008 the cities required to have master plans had their plans enacted by local administrations as the law of the land. Based on the overall responses from the interviews my impression is that in some cities the implementation of these policies was quite controversial. However, if and how mayors and council members
abide by the land-use policy as specified in their cities’ plan must be further investigated. Public representatives could make use of loopholes in the master plans to misrepresent it at their own political convenience. I am inclined to say that the problem here is not much about the master plans themselves. The misrepresentation of the master plans could be linked to the lack of monitoring through their implementation, which may concern the lack of stronger participation of WG members and other community stakeholders through the execution of the master plans.

It was a consensus in the interviewees that as the WG’s advanced through the third phase of the program City for Us, their lack of confidence and uncertainty were indicative that the WG’s resilience was at its lowest. The participants started leaving the program through that phase, and the WG’s gradually became smaller. When I asked a couple interviewees to use a word to describe the vulnerability to political pressure experienced by the WG’s and individual WG members, they made references to empowerment. They suggested that their accessibility to information, their determination and will with a purpose, which an interviewee (field technician) characterized as “idealistic and romantic”, made them resilient yet more vulnerable. She suggested that “it is like swimming against the flow” of a river. I revisited the data segments intrigued with and to make sense of the idea that the more resilient the WG’s were toward the impact of political pressure, more exposed and sensitive they were to the impact of political constraints, whether these constraints held a political agenda or advanced the agenda of landholders and developers”.

Back then I understood from the respondents that the political maneuvering from local representatives, developers, and landholders were more effective when the WG’s
mobilization was left unattended by WG members. Their capacity to mobilize declined more prominently in the period from when the WG’s were writing their master plans through the moment the plans were enacted as municipal law. It was in this period that mayors, developers, and landholder had the opportunity to influence the most in the land-use policies that in some circumstances led to loopholes in the language used in the master plans. A further investigation is needed to identify such loopholes, the circumstances in which they occurred, and their impact through the implementation of the master plans.

5.4 The Relevance of Vulnerability to other Participatory Planning Endeavors

5.4.1 The Community-Based Land-Use Assessment

This paper investigates the community-based state-led program *Cidade pra Gente* (City for Us), that took place in the state of Goiás, Brazil. I discuss the vulnerability debate intrinsic in participatory planning processes, in which the program’s participants developed master plans for the cities they represented in the program. The program participants were grouped in “community work groups” (WG’s), and each group worked with the city they represented in the program. The number of members constituting a WG was determined by the size of the city’s population, and it consisted of at least seven stakeholders including two representatives from the executive branch, one from the legislative branch, one city council, one leader from each urban and rural community, and a high school student. The heterogeneity between and within groups concerns variables such as one’s role in the implementation of the program *City for Us*, gender, levels of
education, household income, political affiliations, life experience in or outside of the metropolitan region, urban or rural dwellers, and one’s exposure to risk and hazardous impact caused by socio-economic uncertainties, political constraints, and vulnerability to climate variability and change. The program was implemented in three phases, wherein under the guidance and technical support of federal, state, and municipal agencies and planning professionals, the WG’s developed master plans for their hometown. Through its Secretary of the Cities, the state provided funding, logistics, staffing, and professionals, to the activities held in the state capital including the “capacity building workshops”. Similar support was provided by the cities to the activities held locally including the public hearings, and field activities, which occurred subsequently to the capacity building workshops. This was a volunteer work by the WG members. However, many work groups members were public servants, like local teachers, were re-assigned to work exclusively with other community stakeholders as WG’s member. In many circumstances, they ended up as the WG’s coordinators.

As an icebreaking activity in the first phase WG’s developed a time line of their cities. In a subsequent and lasting longer activity, they developed community-based assessments, wherein they compiled data of all kinds and from all sources, they mapped their cities’ current urban and rural infrastructure, social services, city governance and budget, urban and rural risk areas with propensity to cause hazard to individuals and groups, and to be avoided for specific land-use practices, and local economic strength and potentiality. They discussed their institutional, social, economic, environmental and cultural weaknesses and potentialities with their team players, and other WG’s in the 2 days monthly workshops held in the state capital. They assessed the necessary conditions
for the implementation of these potentialities within a short, median, and or long term, and the social-economic and environmental impact of these implementations. The WG’s identified, quantified and prioritized their cities’ many problems and potentialities, and systematized and encapsulated their findings in final reports, from which copies were handed to the executive and legislative bodies of their respective cities. Based on their findings from the land-use assessment report, in the second phase WG’s characterized the various land-uses of both urban and rural areas, defined the urban perimeter, and determined the master plan’ guiding principles, visions and goals (elements), key strategies, and directions.

In the third step the WG’s wrote their master plans and submitted the document for the city councils, which was eventually enacted into municipal law. The master plan’s guiding principles were generally underlined with principles of sustainability, the social function of the city, and equity. However, how fully these policies were implemented, once the master plan was enacted as the law of the land, remains to be seen. I observed and documented in my interviews the generalized bitter sweetness of respondents toward the end of the planning process, and most of all with the perceptions of cynicism about the ultimate ability to have the executive and legislative government branches abide by the master plan. A couple of respondents pointed to the lack of specific legislation (ordinance), which was a limitation for the enforcement of key elements of their master plans. They shared with me that local administrators, developers, and farmers might take advantage of these and other loopholes in the plan.

The adaptation scholarship in the social sciences presents the concept of adaptation as a response to risks associated with human vulnerability or adaptative
capacity to hazard impacts (Smit and Wandel, 2006). Smit and Wandel (2006) maintain that *practical adaptation studies* are community-based studies that focus on documenting the knowledge building of community members and decision-making processes, which examine local adaptative capacity and the capacity needs of the community that has experienced hazard, with the purpose of recognizing ways to implement adaptation measures and improve the adaptative capacity of the community. These studies used “bottom-up” scenario-based approaches in which stakeholders made use of experience and knowledge to assess their community’s conditions and sensitivities, to develop and decide for strategies to increase the resilience, and therefore, the adaptative capacity of their community. Based on its three implementation phases and the participatory methodology carried through the planning process under the program City for Us, which led to the development of and enacting of their hometowns’ master plans into municipal law, I consider that the program held key components of Smit and Wandel’s *practical adaptation*. More so I understand that the socio-economic and environmental implications associated to existing land-use practices discussed by the program participants concern their exposure to risk (and hazard), and so it concerns their vulnerability and capacity to adapt to natural and human induced stresses.

### 5.4.2 Mainstreaming Climate Adaptation in Community-Based Planning

The social vulnerability literature in the dissertation advances the integrated approach of adaptation to climate variability and change, suggested by a number of researchers who in some fashion put forward the use of community-based strategies to develop vulnerability studies and assessments, while mainstreaming adaptation measures
into developmental and or planning initiatives (Adger et al, 2004; Smit and Wandel, 2006; Wisner et al, 2003; Blaikie et al, 1994). In the course of the discussion aspects of the root causes and sources of the problems they face in their cities, to these conditions, emerge in their discussions. However, these problems are not linked to climate change in a manner that gives participants an awareness of the facts and implications, and the relevance and urgency to address climate change. Burton’s (2004) argument for mainstreaming adaptation measures in developmental initiatives suggests that because of the urgency to address climate change, the many uncertainties associated to climate change models and scenarios, and the fact that climate change adaptation measures are embedded in the development policies, the adaptation policies should be applied in two phases. The author sees climate change adaptation as process in which phase one sets the basis for the advancement of a more climate change oriented agenda to be carried through the second phase. Both phases identify the exposure of human and natural systems to risk, their vulnerability to hazard impacts, and advance adaptation measures. However, in phase one the adaptation schemes are mainstreamed into development and land-use policies to address more immediate risks. That sets the basis for the advancement of a more climate change oriented agenda to be carried through the second phase.

Moench (2007) maintains that development contexts are a primary “windows of opportunity” since they allow the identification, analysis, and long-term solutions for problems; if they advance planning it will be an “entry point” to implement more robust change. The Brazilian federal law Estatuto da Cidade (Statute of the City) enacted in 2001 set the parameters for urban development policies nationwide. The state-led program City for Us advances the Statute’s guiding principle of the social function of the
city, wherein the master plans developed through the participatory planning under the program shall serve the collective interest. Based on this premise I am inclined to consider that the program City for Us was a “window of opportunity”. As it concerns to the current state and process, the research findings indicate that vulnerability was implicit in the WG’s assessment wherein land-use links to risk and the problem areas. The WG’s discussed their assessments in the capacity building workshops, public hearings, and in many other circumstances. The outcomes of their assessments were compiled in the WG’s community-based assessment reports, which were the basis for the development of the land-use policies carried in their master plans; eventually enacted as municipal law.

Since the state-led program City for Us advances the national parameters for urban development, and the WG’s produced master plans for their cities, the program is the “entry point” to implement more robust change which in some fashion may be achieved through the revision of the master plans developed through the participatory planning process under the program City for Us. The desired state and process to be advanced through the revised master plan would entail the re-assessment of risk as a function of climate change with broader analysis of how risk elements emerged because of vulnerability factors. That gives the opportunity to fully raise, examine, and enhance vulnerability to climate change adaptation. Otherwise, the focus is an objective observation response to issues with climate variability, without a comprehensive analysis and plan.

Mainstreaming climate change adaptation in two phases appears to be the propensity of the respondents of the interviews done earlier in my investigation. At certain point in my interviews, while investigating the relevance of the knowledge built
as outcome of their participation in the land-use assessment advanced in the program City for Us, I inquired the respondents who participated in the WG’s about the significance of addressing climate change adaptation in the revision of the master plans they developed through the program City for Us; if so how that should be incorporated (mainstreaming) in the revision of their master plan. All interviewees responded to that question. As starting point I suggested that mainstreaming climate change adaptation could be considered either as a guiding principle, or having it underlining all existing guiding principles in the revised master plans. Some respondents opted to either one of the mainstreaming approach where others were not so sure. Even though it was not a focus point in research, I am inclined to say that their responses fell in a continuum between placing climate change adaptation either as a guiding principle or having it underlining all existing guiding principles. Although it needs further analysis, while framing the program *City for Us* with Smit and Wandel’s (2006) concept of “practical adaptation”, their responses lead me to contemplate the many benefits of community-based vulnerability assessments to non-climate and climate change adaptation.

My investigation has an instrumental purpose, which means that even prior to data collection the investigator has intention to utilize the findings as applicable knowledge. The findings from this investigation can contribute to methodological frameworks when developing or revising master plans, development policies, and capacity building initiatives engaging policy makers, city managers and planning professionals, community leaders and the public to communicate and advance the climate change dialogue. In light of the purpose and the process experienced by the WG’s, which culminated with the elaboration of the assessment reports of the problems and
potentialities of their cities, and the reports themselves, in a future planning revision process when re-accessing the root causes and sources, or underling vulnerability, the participants can be introduced to a structure to examine and discuss this vulnerability through the lens of climate change impacting their cities.

Brazilian cities are facing a unique intersection as they prepare for federally required updates and revisions to their urban master plans, at a time when they are facing increased impact of climate change and its associated risk. Those participating in this process will grapple with these realities. If the past, initial planning process is predictive, areas of risk will be discussion points; inherent vulnerabilities will emerge as part of that analysis. I have concluded that an optimal approach to comprehensive review of planning issues vis a vis climate change adaptation will use a multisectorial approach through mainstreaming schemes. This approach best positions an analysis that focuses beyond the immediate and obvious impact of climate change threats, and allows for a deliberate full-scale examination of underlying social, economic, political and public policy issues that support and exacerbate vulnerability of these cities.
CHAPTER 6

CONCLUSION

The phenomenon under investigation is the element vulnerability built in the land-use discussion advanced by community stakeholders through the participatory planning process, under the program City for Us. Here, I consider references to the planning process and land-use practices and policies made by a selected number of the program’s participants. I looked to their understanding of how socio-economic forces and institutional constraints (political and cultural), and economic pressure influenced the land-use discussion through their participation in the program, and how it relates to vulnerability where it concerns their vulnerability to risk and hazard impact. The research aims to answer the question “How do land-use practices discussed in participatory planning process relate to vulnerability, and what does this mean for how vulnerability can be relevant in other participatory planning processes?"

Although the program City for Us’ management, field technicians, and the WG members and other community stakeholders had no knowledge or experienced of neither participatory planning nor land-use planning, they learned about these subject as they went through the planning process. My understanding from live interviews, field notes, and coding transcripts, is that the interviewees were more comfortable when addressing the participation element, they experienced through the planning process, than when articulating the land-use subject. In hindsight, the less abstract the concept covered in the interview more comfortable the respondents were talking about. The term sustainability and more so vulnerability are good examples of concepts the respondents had difficulty to articulate during the interviews. I am inclined to say that their comfort levels with the
subject we were covering decreased as we moved through a continuum from participatory planning through land-use, and vulnerability.

Although the term “Climate variability” was not used with frequency by the respondents, this was an issue the WG’s generally brought up to discussion in the public hearings, but my understanding from the interviews is that often climate and environment related issues were not a concern for the community at large. It does make sense to me since the interviews shows that the public hearing the community was more interested to address housing and other socially related urban services issues. In fact, the public hearings that attracted more attendees were the ones in which the discussion subject were more directly related to accessibility to infrastructure, housing, jobs, and public services like education, health, and public safety, among others. Even considering the connectivity of these discussion subjects with climate and environmental related issues, often the attendees could not bring it altogether in their revindications. Climate and environmental related issues like conservation and environmental protection were discussion points for groups of stakeholders who had some education about this subject like teachers, or individuals and groups that were directly impacted by climate variability. Nonetheless, climate variability was implicit in the interviewee’s responses when they made references to climate events such as flood, drought, and high temperatures. The former may partially explain the reason why the concept “climate change” was seldom brought up in the interview by the respondents.

Whereas the term “vulnerability” was not generally spoken by the interviewees, it was implicit in various segments of their answers. For instance, when the respondents articulated or made references to the socio-economic and political unpredictability, and
institutional constraints they experienced through the planning process. These experiences usually would occur when land-use conservation and protection was the subject of discussion. When the term vulnerability was not spoken by the respondents I brought it in to the interview using follow up questions. In doing so I was testing if the respondents could connect their land-use narrative with climate variability and change. From that point and on through the end of the interview, and whenever it was appropriate, I brought in words like adaptation, adaptative capacity, resilience, and climate change, in a manner to explore these concepts through the respondents’ perspective. I could pursue on that, usually when the respondents held college degree or professional experience related to architecture, geography, biosciences, and education. In some interviews, I observed that words like adaptation and vulnerability can carry a pejorative meaning like weakness, which lead me to contemplate that culture and moral values are important elements to consider when informing climate change.

Generally, it was a consensus amongst the respondents about the value of their learning experience, where it concerns the subject participatory planning, land-use, and the comprehensiveness of master plans. My understanding from their responses to the interviews is that most of the respondents could identify and connect land-use practices with their exposure and sensitivity to risk and hazard impact. In several cases the terms exposure and sensitive were not explicitly mentioned in their answers, yet like the term vulnerability it was implicit in their answers. From the interviews, I understand that by the end of the program City for Us, in one way or another they had awareness of the implications from urban expansion, where it concerns their accessibility to housing, mobility, public services, and environmental services (e.g. water), conservation, and
protection. By the end of the interviews my understanding from many respondents was that in one way or another they unintentionally were advancing some sort of climate dialogue through their discussion of land-use practices, when going through the various activities under the program City for Us.

I contemplate that community-based vulnerability assessments can become a systematic part in the development or revisions of community-based master plans. In that case, the development of master plans can be considered the first out of two steps to address climate change adaptation. The second phase could take place in the revision of the master plans, or in the development of strategic adaptation plans. Case in point, the revision of the master plans developed through the participatory planning process, under the program City for Us, might be addresses climate change adaptation in the revision of these plans.

A core and essential element of my research is a belief that often we have levels of knowledge and awareness of our lives and surroundings that is tacit, and not fully formulated into ideas or concepts. The cohort examined in my study learned firsthand about planning and the perseverance required to benefit from participating in community-based processes. They had varying levels of awareness of vulnerability to environmental and climate change going on in their communities and beyond. They articulated these thoughts sporadically or in indirect ways. Planners have the capacity to harness these thoughts and ideas through a participatory process that elicits them into a fuller awareness that can inform and influence planning and change that will impact their communities and environment.


Boon, Helen J.; Millar, Joanne; Lake, David; Cottrell, Alison; King, David (2012), “Recovery from Disaster: Resilience, Adaptability and Perceptions of Climate Change”, National Climate Change Adaptation Research Facility, Gold Coast, pp. 467.


Gidley, Jennifer M.; Fien, John; Smith, Jodi-Anne.; Thomsen, Dana C. and Smith, Timothy F. (2009), “Participatory Futures Methods: Towards Adaptability and Resilience in Climate-Vulnerability Communities”, in Environmental Policy and Governance, 427-440.


Ministry of the Cities, Brazil (www.cidades.gov.br), 07/30/13, 19:43)

Ministry of the Environment, Brazil (MOMA) (www.mma.gov.br/biomas/cerrado), 07/30/13, 13:28)

Brazilian Institute of Geography and Statistics (IBGE) (www.ibge.gov.br), 07/30/13, 10:01


Wisner, Ben; Blaikie, Piers; Cannon, Terry; Davis, Ian (2003), “At Risk: Natural Hazerds, People’s Vulnerability and Disasters” (2nd Ed), Routledge, pp 496.