

## **Planning for vulnerability in South America's Brazilian Cerrado: a people-based approach**

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There are many calls to integrate – or mainstream – vulnerability and climate planning into the comprehensive planning process, and to engage in participatory processes around these themes. How to do this in ways that are meaningful to residents in a developing and or emerging country context is, however, less clear. Additionally, experts press the need to prepare communities for a changing climate, but bottom-up perspectives on what this means for local land use are less well developed. My investigation in this paper is innovative in that it seeks to understand perspectives of a wide range of participants in a comprehensive planning process, and explore the meaning of vulnerability in a Latin American context.

The case study in the paper is the community-based program *Cidade pra Gente* (City for Us) led by the state of Goiás, which ran from 2005-2008. At certain point the program engaged approximately 1,100 stakeholders, from 88 cities statewide, in a participatory planning process to develop master plans, which were enacted as municipal law by the participant cities. The paper brings the attention to the vulnerability of systems in the Brazilian biome *Cerrado*, which is the predominant landscape in Brazil's state of Goiás. The *Cerrado* has experienced significant inflow of foreign and national investment and technology for the production of agro- commodities in the past few decades. This has led to a fast pace of urbanization, population growth, urban expansion, and rapid change of land-uses and cover.

This paper discusses vulnerability through the urban expansion perspective. My investigation considers references to the 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. I look at their understanding of

how socio-economic and institutional forces influence planning process and land-use practices, and how it links to urban expansion and vulnerability where it concerns their exposure to risk and hazard impact. The exploratory design of this research paper advances the qualitative paradigm aligned 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, journaling, field notes, and memos. Triangulation uses qualitative and quantitative data from national and state surveys, databases, and archives that include toolkits and publications used through the City for Us program.

I am currently in the process of completing my investigation. To date, pilot findings suggest that vulnerability was seldom explicitly spoken through the planning process. However, by the end of the interviews done with a selected group of stakeholders that participated in the program *City for Us*, the respondents suggested that in fact, vulnerability was discussed in the planning process when they articulated or made references to the socio-economic and political unpredictability, and institutional constraints they faced when discussing existing land-use practices. Additional findings derived from the interviews suggest that environmental protection and conservation were main concerns to be addressed through their master plans. Although their discussion on these subjects were framed generally with the social, economic and environmental dimensions of the sustainability paradigm, generally the concept of sustainability was not clearly understood, expressed, or carried out through the planning process. Some respondents suggested that in many circumstances sustainability was an underlying element of their arguments when they were considering alternative land-use and planning policies to contain urban expansion, or even to reduce existing urban perimeters.

The respondents made references back to their communities, wherein local stakeholders were generally concerned with the social-economic implications resulting from land-use practices, and that somehow the environmental problems they were facing would be addressed through policies that address the social-economic determinants of their problems (vulnerability). In various circumstances respondents

suggested that the economic and environmental uncertainties they faced were built into their social problems, which leads me to contemplate that the economic and environmental factors are determinants of their social vulnerability.

The generalizable research outcome is better policy that links urban expansion and vulnerability in ways that are meaningful to local residents and decision-makers. The research improves methodological frameworks for development of or revision of community-based master plans, development policies, and for capacity building initiatives that engage policy makers, city managers and planning professionals, community leaders, and the general public in the climate change dialogue. It is noteworthy that this paper points out that local knowledge shared by vulnerable communities can become a systematic part of the learning efforts to address adaptation to climate change, while mainstreaming vulnerability reduction in developmental and planning initiatives.

**BIBLIOGRAPHY** (additional references available upon request)

- Adger, W. N. (2006) "Vulnerability", in *Global Environmental Change*, Elsevier (6), 268-81.
- Adger, W. Neil; Brooks, Nick; Bentham, Graham; Agnew, Maureen; Eriskin, Siri (2004) "New Indicators of Vulnerability and Adaptive Capacity", Tyndall Centre for Climate Change Research, pp 102.
- Barker, Terry; Scricciu, Serban; Taylor, David (2008) "Climate Change, Social Justice and Development", *Society for International Development* 1011-6370/08, 51, 317-324.
- Brooks, Nick (2003) "Vulnerability, Risk and Adaptation: A Conceptual Framework", Tyndall Centre for Climate Change Research, working paper 38, pp 16.
- Burton, I. (2004) "Climate Change and the Adaptation Deficit", in *Adaptation to Climate Change*, Schipper, E. and Burton, I. (eds.), 89-95.
- Creswell, J. W. (2007) "Qualitative Inquiry and Research Design: Choosing Among Five Approaches, Sage Publications", Thousand Oaks, CA, pp 395.
- Füssel, H M (2010) "Development and Climate Change: Review and Quantitative Analysis of Indices of Climate Change Exposure, Adaptive Capacity, Sensitivity, Impacts", *World Development Report*, pp 29.

Glaser, Barney G. and Strauss, Anselm L (1967) “The Discovery of Grounded Theory: Strategies for Qualitative Research”, Aldine Publishing Company, N.Y., 262 pp.

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

Handmer, J. (2003) “Adaptative Capacity: What Does it Mean in the Context of Natural Hazards?”, E, Schipper and I. Burton (eds.), *Adaptation to Climate Change*, 213-228.

Hogan, Daniel J. and Ojima Ricardo (2010) “Urban Sprawl: A challenge for sustainability”, Martine, G.; McGranahan, G.; Montgomery, M., Fernández-Castilla (eds), in *The New Global Frontier: Urbanization, Poverty, Environment in the 21<sup>st</sup> Century*, Earthscan, 203-220.

Huq, S. and Reid, H. (2004) “Mainstreaming Adaptation in Development”, in *IDS Bulletin*, University of Sussex, vol. 35, # 3, 15-21.

IPCC AR5 (2013) <http://www.ipcc.ch/report/ar5/wg1/>

Kelly, P. M.; Adger W.N. (2000) “Theory and Practice in Assessing Vulnerability to Climate Change and Facilitating Adaptation”, in *Climate Change*, Springer, vol. 47, # 4, 325-352.

Laboratorio das Metropolis (2011) “Projeto Rede de Avaliacao e Capacitacao Para a Implementacao do Planos Diretores Participativos – Project Network for Assessment and Capacity Building for the Implementation of Participatory Master Plans”, Ministerio das Cidades, Brazil, 295.

Lindoso, Diego et al (2009) “Vulnerabilidade Socioeconômica da Agricultura Familiar Brasileira às Mudanças climáticas”: O desafio da Avaliação de Realidades Complexas”, in *Boletim Regional, Urbano e Ambiental*, IPEA, Brazil, vol 4, 21-31.

Maricato, Erminia (2010) “The Statue of the Peripheral City”, in *The City Statute of Brazil: A Comentary*, Carvalho, Celso C. and Rossbach, Ana C. (orgs), Cities Alliance and Ministry of Cities, 5-22.

Milanez, B. and Fonseca, I. F. Da (2010) “Justiça Climática e Eventos Climáticos Extremos: O Caso das Enchentes do Brazil”, in *Revista Brasileira de Estudos Urbanos e Regionais*, IPEA, Brazil, vol 4, 93-101.

Ministério do Meio Ambiente, Brazil, [www.mma.gov.br/biomas/cerrado](http://www.mma.gov.br/biomas/cerrado).

- O'Brien, Karen and Leichencko, Robin (2009) "Human Security, Vulnerability and Sustainable Adaptation", Human Development Report 2007-2008, UNDP, 48.
- Pittock, A. B.; Jones, R. N. (2000) "Adaptation to What and Why?", in *Environmental Monitoring and Assessment*, Springer, Vol. 61, Iss 1, pp 9-35.
- Schipper, E. L. F (2007) "Climate Change Adaptation and Development: Exploring the Linkages", Tyndall Centre for Climate Change Research, working paper 187, 19.
- Sánchez-Rodríguez (2010) "Urban Sustainability and Global Environmental Change: Reflections for an Urban Agenda", Martine, G.; McGranahan, G.; Montgomery, M., Fernández-Castilla (eds), in *The New Global Frontier: Urbanization, Poverty Environment in the 21<sup>st</sup> Century*, Earthscan, 203-220.
- Sawyer, Donald (2008) "Climate Change, Biofuels Eco-Social Impacts in the Brazilian Amazon and Cerrado", in *Philos Trans R Soc Lond B Biol Sci.*, 363(1498): 1747–1752.
- Smit, B., Wandel, J. (2006) "Adaptation, Adaptive Capacity and Vulnerability", Global Environmental Change, in *Elsevier*, v. 16, 282-292.
- UN Human Settlements Programme (2011) " Cities and Climate Change: Global Report on Human Settlements", Earthscan, London, pp 271.
- Wisner, B.; Blaikie, P.; Cannon, T.; Davis, I. (2003) "At Risk: Natural Hazards, People's Vulnerability and Disasters" (2<sup>nd</sup> Ed), Routledge, 496.