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Making science more useful to decision-making in risk situations

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Risk situations related to brownfield sites, contaminated lands and exposed groups to toxic substances:

- are usually characterized by considerable uncertainty, strain and controversy
- their residents are living in a collective stress (physical conditions in their neighborhood, and possible impacts on their health)

Lead problem in Brazil – Ribeira Valley (PR), Bauru (SP), S. Amaro da Purificação (BA)

- These communities have all been exposed to lead pollution, to various degrees, as a consequence of industrial, mining and processing activities that were developed over decades with limited control, oversight and regulation of environmental/human health impacts

- Some studies have pointed out the impacts of lead exposure and their respective effects

Climate change - risks that are characterized by:

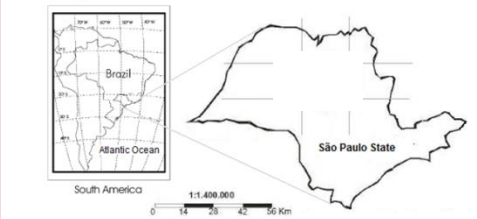
- incomplete understanding of their causes and consequences,
- the fact of being incalculable, impossible to compensate,
- and often invisible, uncontrollable and irreversible

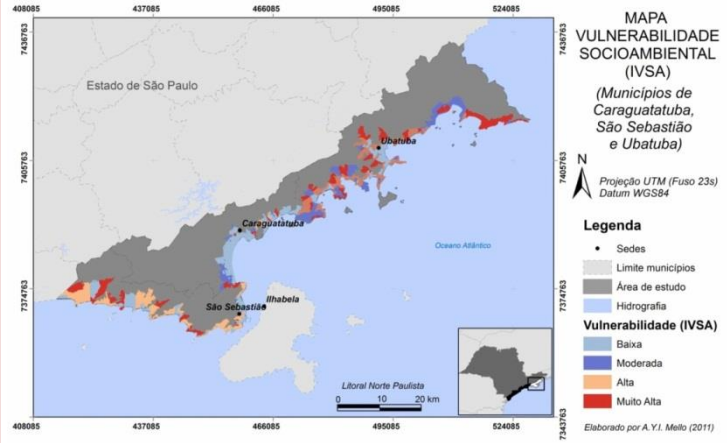
◊ Apparent inability to cope with risks of various forms

◊ A comprehensive vulnerability assessment for most regions is often lacking

Coast of São Paulo, Brazil

- The São Paulo Coast, Brazil summarizes the socio-ecological dilemmas of contemporary economic development
- The combined pressures of tourism, industry, oil extraction transport, challenges to quality of life and sustainable development are increasingly difficult to resolve
- Environmental and climate changes will intensify these pressures and further limit the margin of maneuver of planners





Potential risks: long and intense rainy periods (causing landslides and floods), higher air temperatures (causing discomfort and health risks), sea level rise, storm surges, proliferation of infectious disease, technological risks (extraction and transportation of offshore oil)

Megacities and climate change
high population density, inequalities, urban infrastructure

- lifestyles associated with urbanization - drivers of climate change (IPCC, 2007, 2014)
- more susceptible to severe impacts related to climate change

new risks and threats will further exacerbate the adverse situations in urban areas

Megacity of São Paulo

Challenge: linking public policies related to climate change to housing policy, sanitation, urban planning, water management, urban mobility

São Paulo: high heterogeneity in terms of different access to resources, levels of poverty and abilities to interact with climate change

Recent examples of socioenvironmental challenges

- models of risk assessment/management
- ways of thinking and acting over geohazards

may not be sufficient for mitigating risks

- Bifurcation of the science inputs - Difficulties of working across disciplinary or knowledge boundaries (Cutter, 2009)
- Policy makers make short-term decisions, but fail to address the long-term implications of decision-making (Aragón-Durand, 2009)
- Researchers/policy makers have gravitate towards a risk management approach that underestimates the potential input from the public, and that most of the time considers only technical and scientific knowledge as legitimate knowledge
- Strategies used by researchers and authorities to communicate risks and hazards for affected communities were limited to the knowledge deficit model
- Dominant risk assessment methodologies and risk communication strategies: reduce complex problems and multi-dimensional risk questions into scientific parameters and cost-benefits analyses

But risk conflicts are not only a question of objective knowledge; instead a range of issues are involved: value conflicts, emotional aspects, conflicts regarding power and different rationalities

How knowledge, science, risks are communicated

From experts/policymakers to the public
Concerns about communication;
No systematic and grounded plan about when and how to communicate with people about the risks

The strategies do not take a dialogue and a partner relationship into account as important elements between those who assess the risks and those who living with the risks

IN CONTRAST:

People get information about these risks:
- Their observations, impressions and perceptions
- Media
- Visibility of studies

- Prevalent understanding that research is not being undertaken for the public good
- Tired of being study object/study area

From experts to decision-makers

✓ communication efforts should cover direct communication with other social groups, in particular with practitioners and community end users

✓ dialogue does not put into in practice in the most of the situations

✓ the most of the efforts cover actions - based on the knowledge deficit model (delivery of reports to policymakers)

✓ strategy does not respond to policymakers needs neither collaborates to build an effective dialogue among the social groups

- difficulties which have characterized the relationship *experts-practitioners*
- Lack of dialogue
- Technical information – scientific language
- The difficulty to use the available information in their decisions (controversies, uncertainties)

- **Gaps – become this dialogue more difficult:**

Political culture in Brazil:

- lack of trust in political institutions
- weak articulation among different public sectors
- scientific production: few efforts to strengthen effective dialogue between providers and users of climate information

- **The biggest challenge – science and/or risk communication** is to be an integral part of the disaster response and emergency management
- involving different forms of flow of information between different actors
- ensuring different modes of interaction, participation and partnership

What we also know...

There is not necessarily a linear relationship between science and politics
The existence and availability of a technical and scientific basis do not necessarily lead to rational and correct political decisions

- gap between what scientists understand as useful information and what users recognize as usable in their decisionmaking

- climate science usability is a function both of the context of potential use and of the process of scientific knowledge production itself

➢ usability of scientific information depends on interconnected factors (Lemos et al, 2012)

- users' perception of information
- how new knowledge interplays with other kinds of knowledge that are currently used by users
- the level and quality of interaction between producers and users

Some possibilites?

- **Intervention research projects**

- allow collaboration/interaction between stakeholders and researchers to generate
- the means for collective action
- have the potential to aid climate change adaptation because they generate opportunities for the interaction between stakeholders and researchers to occur, bridging the gap between climate science production, translation and application
- provide opportunities for stakeholders to interact among each other thereby creating arenas for collective debate that can lead to purposeful action for change

- **Participatory research approaches (focus groups , scenario planning, interactive workshop)**

to identify perceptions, communicate risk, exchange experience and knowledge

Papers

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Chapter book

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Thank you!

Many thanks
Fapesp
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Colleagues – Research Projects (USP, Unicamp, Durham University – UK, University of Griffith - AUS, University of Michigan – USA)

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