



Land Use Planning for Reducing Natural Disaster Risks and Damages



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"Environment for Sustainability"



INTRODUCTION

- **International Concerns for Natural Disasters Management and Risks reduction.**
 - UN, FAO, World Bank, Red Cross, FIG
- **Land administration must integrate disaster risks reduction (DRR) into its processes and activities.**
 - *Adopting sustainable land policies*
 - *Controlling the types of rights and interests that are granted in disaster-prone and vulnerable areas.*
- **Joint Project FIG / FAO**



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DISASTER RISKS MANAGEMENT & REDUCTION

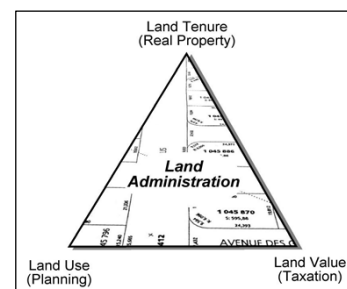
• **Fundamentals & Documentation**

- **Yokohama Strategy** (ONU-IDNDR, 1994)
- **GFDRR: Populations at Risk of Disaster** (WBG, 2000)
- **Hyogo Framework for Action** (UNISDR, 2005-2015)
- **Assessing and Responding to Land Tenure Issues in Disaster Risk Management** (FAO, 2011)
- **Voluntary Guidelines on the Responsible Governance of Tenure** (FAO, 2012)

• **Chapter 20: Regulated Spatial Planning**

LAND ADMINISTRATION

- **Three main components**
 - Land Use Planning
 - Land Tenure & Property Rights
 - Land Value & Taxation
- **Sustainable Governance**
 - Cadastre & Land Registry
 - Zoning
 - Building Codes
 - Expropriation for Land Reserve
 - Public Participation



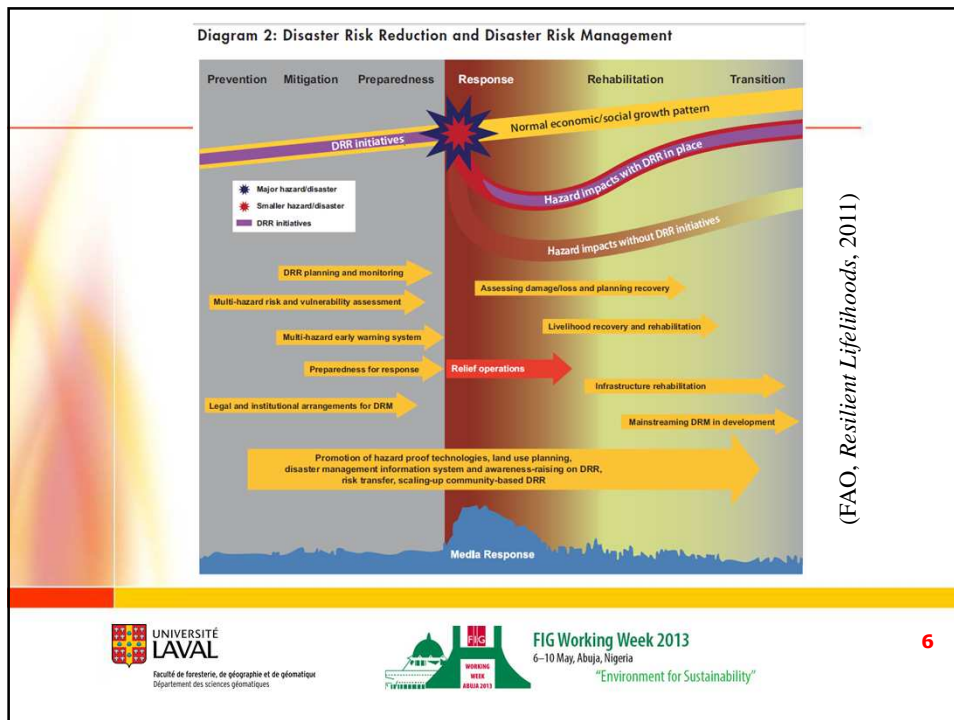
(Adapted from:
Dale & McLaughlin, 1999)

LAND USE PLANNING

- **Land Use Planning is a Rational and Political Process.**
 - The right place for the right use.
 - The right use for the right place.
- **Public Decision Process**
 - Rationality & Contingency (Technical)
- **Political Approach**
 - Preferences & Desires (Political)

LAND USE & LAND TENURE PLANNING ISSUES

- **Land Law**
 - Civil, Common Law, Islamic, Customary
- **Institutional Framework**
 - Capacity for planning and implementing master plans, zoning maps, ...
 - Cadastral System & Land Registration
- **Public Security** (Risk Zoning & Emergency plans)
- **Public Domain, Infrastructure & Services**
- **Accessibility to: Land, Housing, Services**
- **Gender Equity** (roles, needs, responsibilities, titles)
- **Public Participation**



- ### 3 LAND USE PLANNING PHASES
- **Before the Disaster**
 - Prevention, Mitigation, Preparedness
 - Planning: Knowledge, Risk Assessment, Decision
 - **During the Disaster**
 - Emergency
 - Individual Behaviours
 - **After the Disaster**
 - Reconstruction, Relocation, Recovery
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- FIG Working Week 2013
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BEFORE A DISASTER

- **Characterisation and Location of vulnerable sites**

- Documentation, risks, opportunities, ...

- **Local Risk Reduction**

- ≠ Elimination of possible damages
 - Loss of human life, material destruction
- Example of Hurricane Sandy (October 2012)

*Haiti's State of Emergency
after Hurricane Sandy
(October 2012)*



Photo Credit : Carl Juste, The Miami Herald/AP

- **From Master Plan to Risk Zoning**

- Experts
- Authorities
- Population

RISK ZONING

- **Restrictions to land use, land division, and building**

- Legal Standards, Prohibition, Building Codes

- **Different types of zone:**

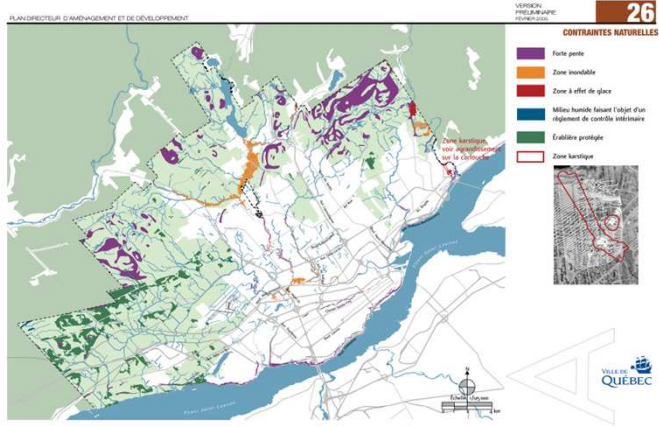
- Flood / Tsunami
- Coastal Erosion
- Landslide / Soil & Underground Hazard
- Seismic, Volcanic

- Hurricane, Ice Movement, Ice Rain



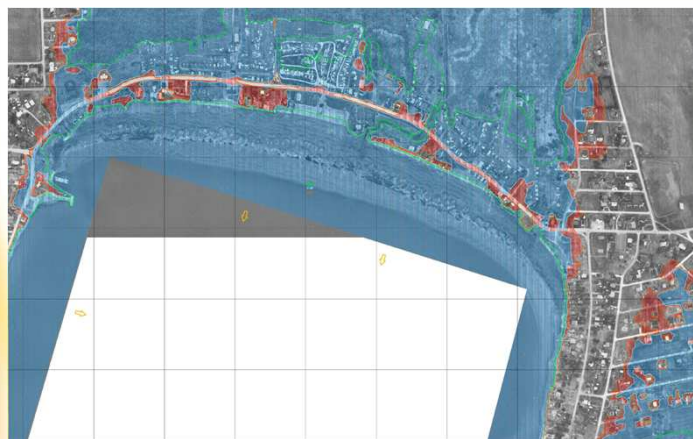
- Buildings Standards (rather than Geospatial Zoning)

EXAMPLE OF A MASTER PLAN NATURAL CONSTRAINT ZONE



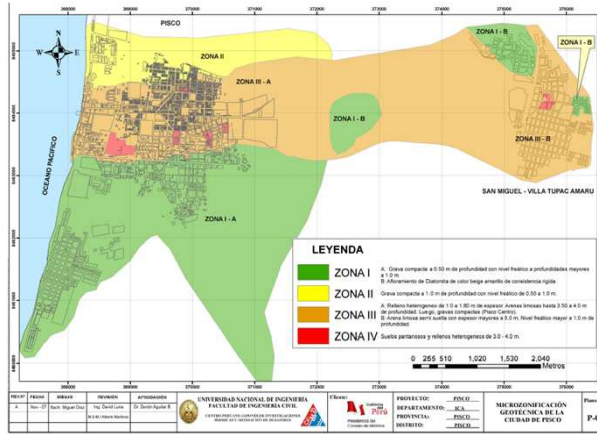
Source: Ville de Québec (2005)

EXAMPLE OF A ZONING MAP FLOOD ZONE



Source : www.mrchr.qc.ca/documents/plaineinondabl@carre0715.pdf

EXAMPLE OF A ZONING MAP SEISMIC ZONE



Source: Estrada (2008)

EARTHQUAKE IN PISCO (PERU) IN AUGUST 2007

Need for
Building
Standards?



Source: Estrada (2008)

DURING A DISASTER

- **Planning for Emergency Situation**
- **Safe Sites Identification (WHERE)**
 - Natural Disaster Refugees
 - Temporary Relocation
 - Services: water, food, medication
 - Rubble Removal & Disposal
- **Public Information Strategy and Diffusion**
 - Every individual should know what to do, and where to go, in case of a disaster.
 - Role of Social Networks (WiFi Networks)
(again example of Hurricane Sandy in October 2012)

EXAMPLE OF HAITI



Un an après le tremblement de terre, la reconstruction d'Haïti se fait toujours attendre. Des milliers, voire des millions d'Haïtiens sont toujours dans une situation précaire dans des camps de réfugiés, comme ici à Pétionville.

PHOTO: KENA BETANCUR, REUTERS

AFTER A DISASTER

- **Reconstruction**

- Indemnification (monetary) / Replacement (material) ?
- Same sites / New sites ?

- **Relocation**

- New Physical Environment
- **A New Community ?**
 - **Creating a new community is an important issue (maybe the most important).**
 - **If not taken into account, it is a reason why relocation project fails.**

VOLUNTARY PUBLIC PARTICIPATION

- **Public Information and Communication**
- **Consolidation of Resilient Community (**identity**)**
- **Social Acceptance of Decisions and Actions (**effectivity**)**
- **Local Leadership (**representativity**)**
- **Involvement in Disaster Risk Reduction Process**
- **Tenure and Planning Terminology Assimilation**
- **Preparedness to Emergency**
- **Cohesive Relocation and Community Building**

CONCLUSION

- **Planning for Land Tenure and Land Use**
 - Risks assessment, institutional arrangements, social responsibility, citizenship, equity
- **Planning based on a large provision of geospatial information**
- **Zoning as a Tool for Reducing Disaster Risk & Damages**
 - Use Constraints, Land Access Limitations, Land Division Norms, Building Standards
- **Public Participation and Involvement as the heart of the planning process for DRR**