

Increasing Disaster Resilience through Land Use Planning in Megacities: The Case of Fault Zoning in Muntinlupa City, Metro Manila, Philippines

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Primacy of Metro Manila

Fault Creep in Muntinlupa City

From Policy to Practice

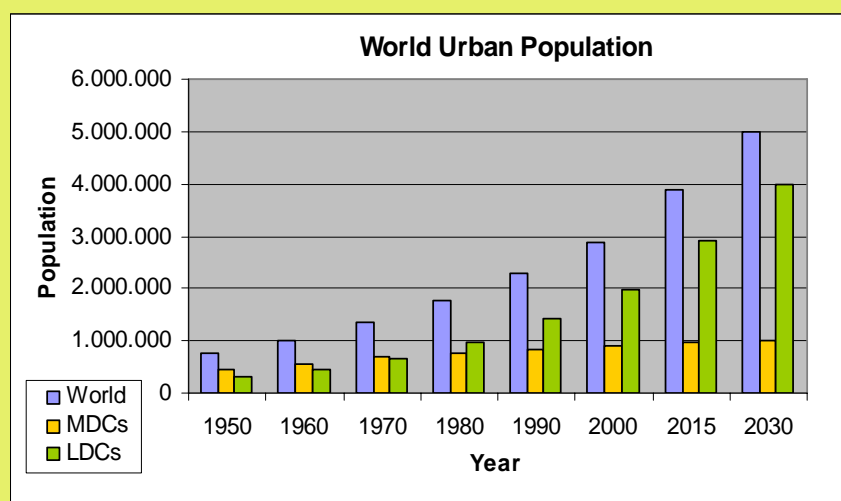
Megacities Resilience Through Land Use Planning

Primacy of Metro Manila

An urban world

Urban Population

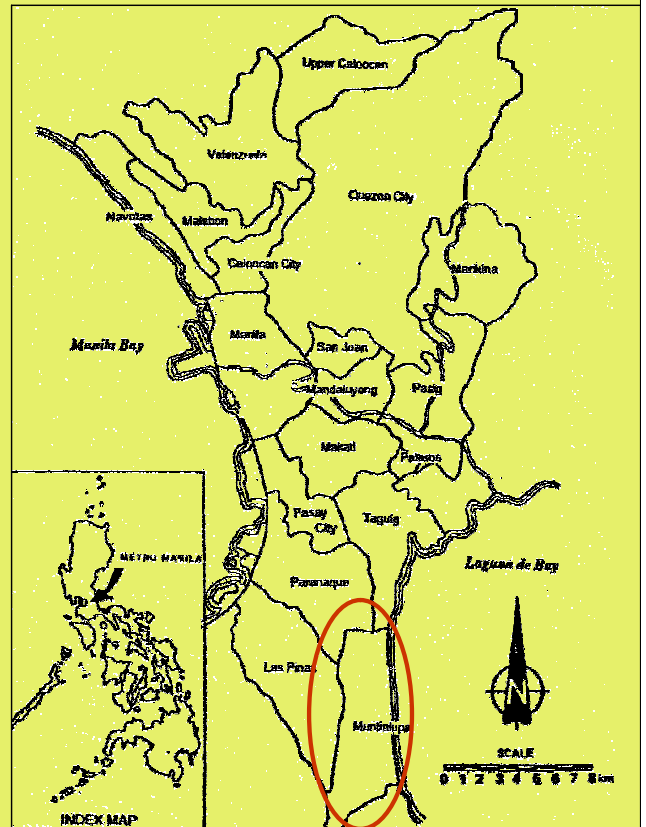
- 1950 : 0.75 B
LDCs : 41 %
MDCs: 59%
- 2000 : 2.86 B
LDCs : 69%
MDCs: 31 %
- 2030 : 4.98 B
LDCs : 80%
MDCs: 20%



- # Urban growth rate in LDCs: 2.35 (29 years)
- # Urban growth in MDCs: 0.38 (185 years)

Primacy of Metro Manila

- Hub of economic, financial, political, social, and cultural life.
- Accounts for the bulk of the country's economy with 32 percent share of the national GDP.
- Population of 10-12 million represents about one-fourth of the country's urban population.
- Composed of 15 cities and 2 municipalities; including Muntinlupa City, one of the fastest growing cities in Metro Manila.
- Muntinlupa has a land area of 47 sq km and a population of 379,310 residents or 78,016 HHs (2000)
- A population density of about 8,000 persons per sq.km.



Fault Creep in Muntinlupa City

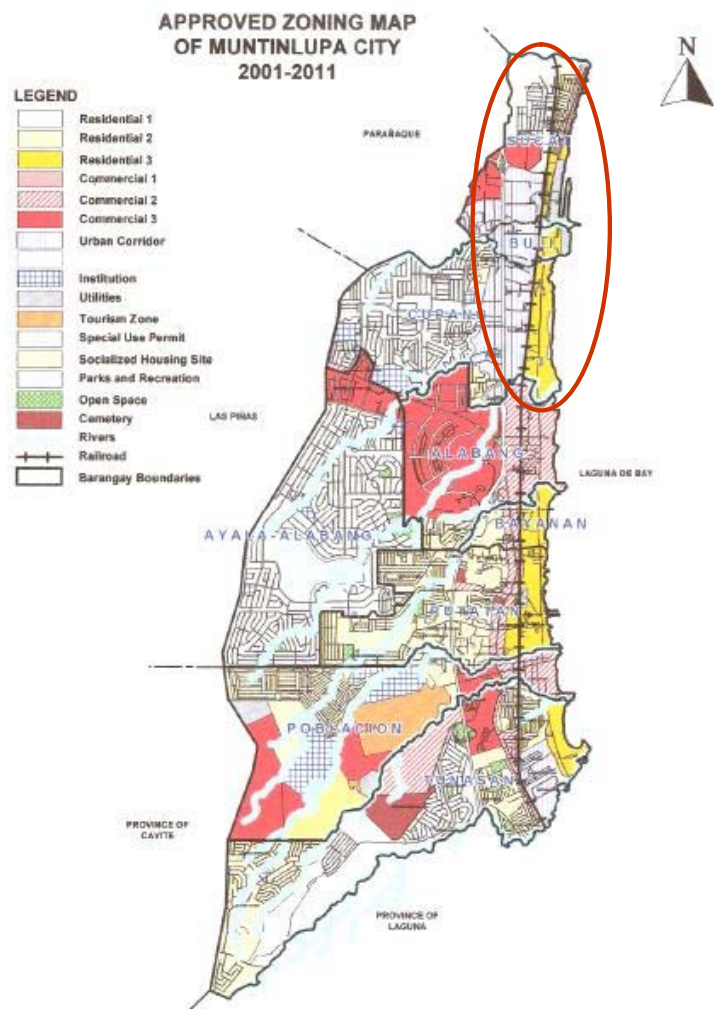


Creeping Faults in Muntinlupa

- In 1994, several industrial companies complained about severe cracks on walls and floors.
- Government geologists mapped and recognized the “linear depression” in the city as a result of fault creep.
- A 2.6 km ground rupture was mapped, additional 17 ground fissures (length of 50 m to 1.4 km) trending north-northeast recognized by 1999.
- Movements along the fissures mostly vertical ranging from 12 cm to 116 cm (average of 50 cm). Left-lateral, horizontal displacement reached 0.25 m.
- Consistent with the characteristics of the West Valley Fault, the master faults, except for the displacement rates which are relatively faster than other fault creeps.
- Some experts favor groundwater extraction as probable cause of subsidence.

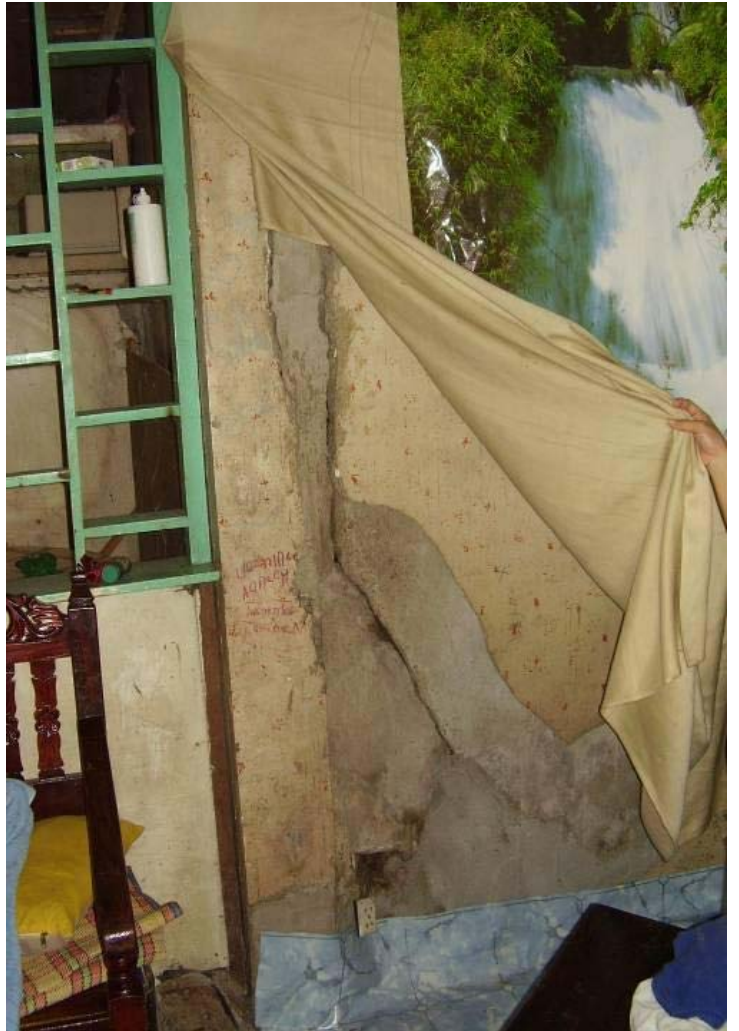


Indicative Map of the West Valley Fault in Metro Manila







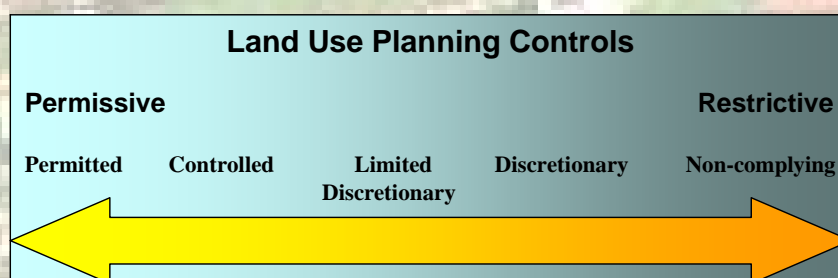




From Policy to Practice

Fault Zoning Ordinance

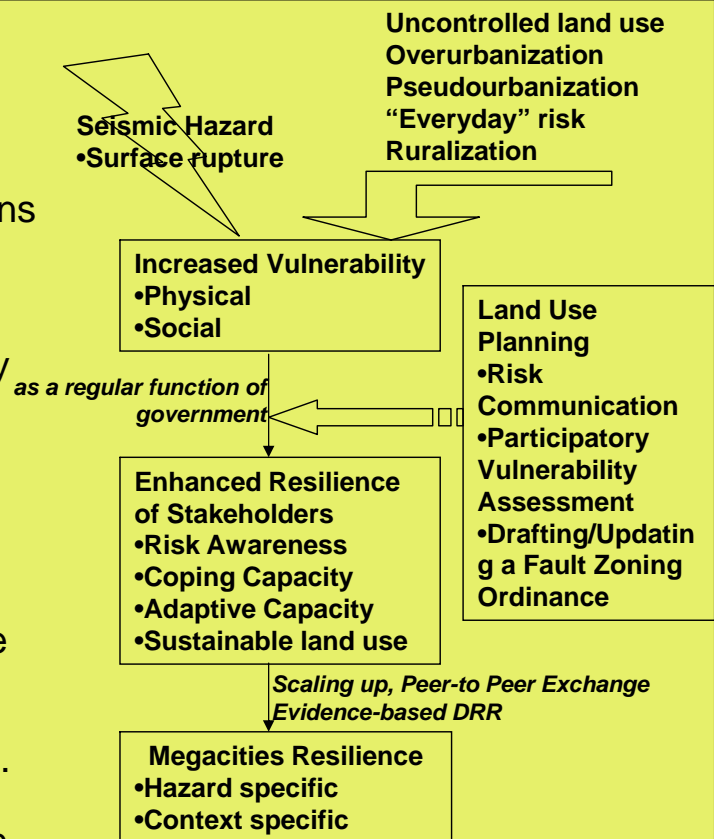
- Zoning – 15 m wide “danger zone”, marking on the ground with red-colored public monuments
- Financial - Voluntary evacuation incentive of 500 euros, 100% real estate tax exemption
- Public disclosure from property seller to buyer
- Land use and development controls - Prohibition of land use and occupancy, condemnation, demolition, e.g. non-issuance of building permits



Source: Ministry of Environment, NZ, 2003.

Conceptual Framework

- **Fault creep** triggers the creeping disaster.
- **Context** - Wider aggravating conditions
- **Physical vulnerability** - location or proximity to the hazard, type of structure, materials used, use of structure, year constructed, occupancy load.
- **Social Vulnerability in land use planning** - **cascade down risk communication** to various vulnerable groups, e.g. MMEIRS information.
 - Incorporate **participatory vulnerability assessment** to enhance the implementability of land use policy
 - **Turn policy it into regular practice**, resulting to enhanced urban resilience.
 - **Scaling up of evidence-based DRR** to other cities (P2P exchange) lying on the fault will lead to a higher level of **resilience** or **stronger desire of people to continue urban life**.



Megacities Resilience Through Land Use Planning

More Questions

- Who are the vulnerable groups? How? Why?
- What kind of risk communication can be effective to each group of stakeholders?
- What participatory social vulnerability assessment methods can be used to mainstream risk parameters in land use planning?
- How can participatory methods be applied in the urban context to make land use plans and policies more responsive to socially vulnerable groups and enhance their effectiveness?

Crucibles of risk or agents of progress?



Danke!
Salamat!
Thank you!