



Image: hcp.co.in

Strengthening Disaster Resilience in Green Cities

Internal Brainstorming on Green Cities Initiatives
7 June 2013

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Shared **disaster risk**
is caused by the interaction of
hazard with **exposure** and **vulnerability**



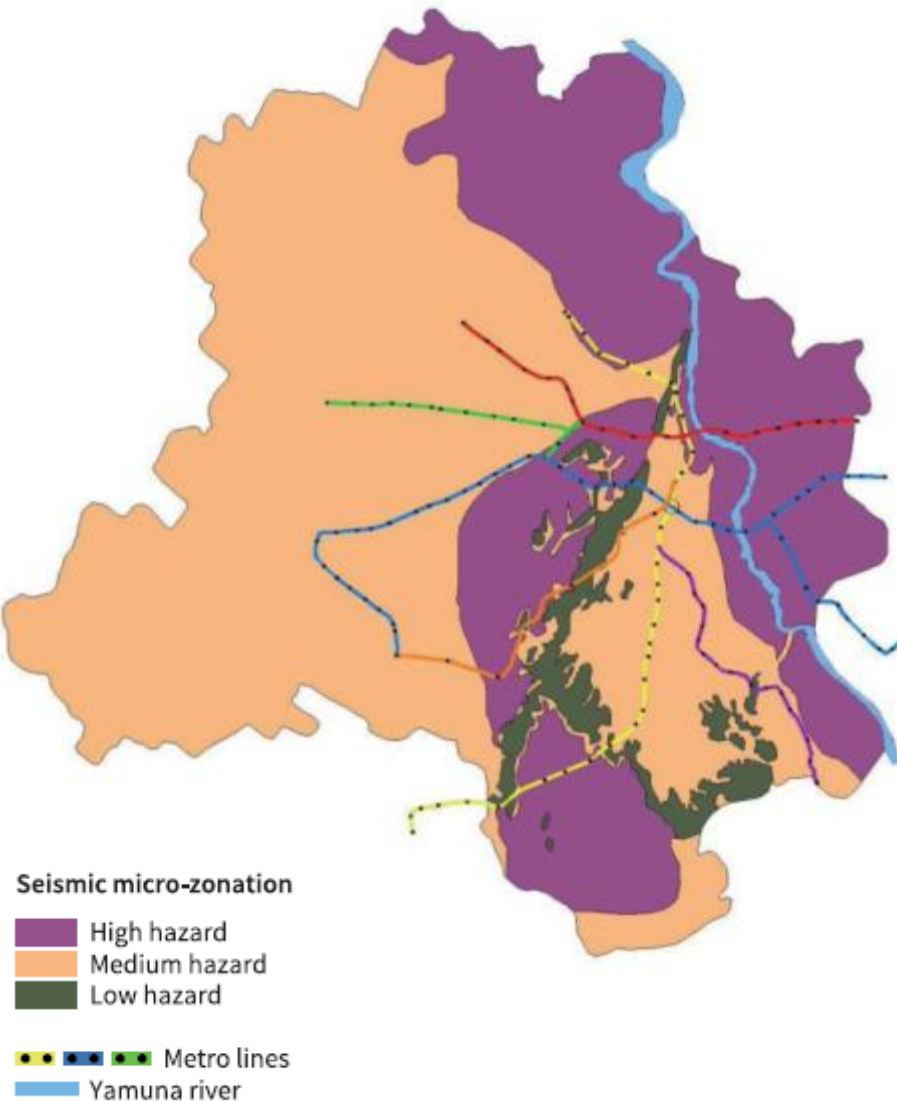
Impacts of 2011 Bangkok floods magnified by



Image: thaivisual.com

- Dense urbanization
- Clogged canals
- Degraded watersheds
- Weak urban planning and management
- Groundwater extraction

Delhi metro may contribute to increasing earthquake and flood risk



- More than **50 stations** located in areas of high **earthquake hazard**
- **One station** built in a **high flood hazard area**
- Hazard information was available on municipal zoning maps
- Metro stations and rail line adopted **risk-sensitive construction codes**

“... this is **not necessarily the case for new real estate developments surrounding the stations**”

Green Cities

“Improvements in **living environment** of the residents and contribute to environmental **sustainability** at the global level”



Disasters impact living environment and environmental sustainability

Living environment can increase disaster risk



Urban living environment and disaster risk

“Risks produced through large numbers of individual public and private investment decisions and non-decisions taken over long periods- making it difficult to attribute responsibility, ownership or liability”

GAR, 2013

Location - Interplay of **economic and physical geography** is one major reason for high hazard risk in urban areas

Density - **Population, infrastructure, high cost of land and asset**- results in increase in exposure and vulnerability

Dynamic – Interaction of **underlying drivers of risk** (e.g. land use change, urban density, building design) and hazard vulnerability and exposure is dynamic in the future may differ from the past

Systemic character - **Interconnected** investments and services increases vulnerability

Investments to improve living condition and sustainability need to factor in **disaster resilience**

Investment in disaster resilience requires to

- **Know the risk**
 - **Expected loss** from specific or multiple hazard over given period. *“Most disasters that could occur haven’t happened yet GAR 2013”*
- **Reduce risk**
 - Reducing exposure and vulnerability of people or assets that are linked to their geographical location
- **Manage residual risk**
 - Managing uncertainty in **flexible and robust** way

Investment is efficient and effective when:

- **Addressed together with other major catastrophic and systemic risks in the urban area**
- **Integrated with green development improvements [Spatial planning, Transport, Water etc.]**





How to embed disaster resilience in initiatives related to Green Cities

- Spatial planning
- Regulations
- Strengthening disaster resilience in urban investments
- Standalone investments to strengthen disaster resilience

“Consider investment in disaster resilience and investment in development NOT as separate issue”

ADB, 2013

Image: AFP and ADPC



Spatial planning in Green Cities

“to achieve resource efficient settlement pattern with high levels of economic output”

Risk informed decision making around planning and management of **urban form, size, density**

- Natural **hazard risk** facing **today and tomorrow**
- Hazard risk **beyond immediate urban boundary**
- **Uncertainty** – takes account of potential systems failures and **prepare for wide range of futures**

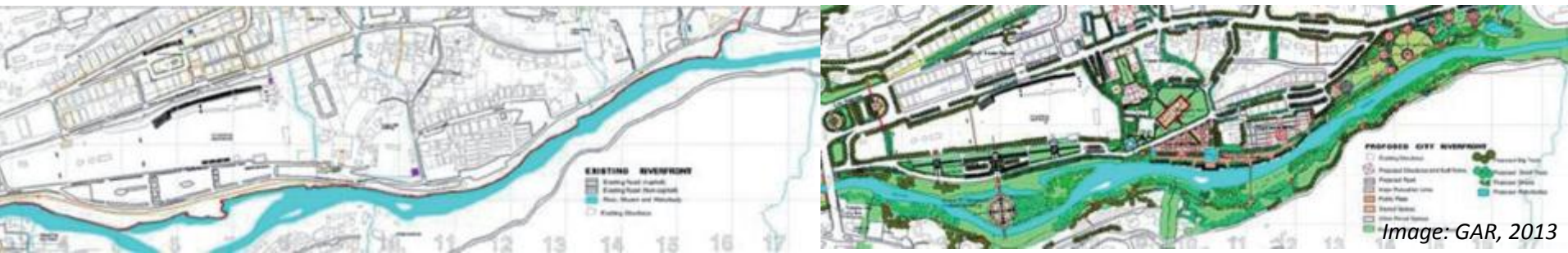


National Urban Assessments should factor in disaster risk information and identify disaster risk issues that might interact with sectoral growth, help develop a resilience vision

Urban region (city) plans should factor in disaster risk information and prioritize investments to reduce disaster risk where necessary

Risk informed incentive-based regulations

- Location based regulations that **advance disaster resilience and green development**
 - E.g. **Zoning** of flood area will encourage green development
 - E.g. Preferential **tax** treatments in exchange for protecting environmental buffers
- Regulations that **do not work at cross-purpose**
 - E.g. Increase in density leading to decrease in permeability of open spaces
- Regulations **designed in coordination** between sector-specific agencies engaged with land management and cooperation between adjoining jurisdictions when risks extend beyond urban limits



Disaster resilience in urban investments

Resilience can/should be built into all urban sectors through management of locational, structural, operational and financial aspects of disaster risk.

Most successful investments will rely on a mix of these

Image: ADB

- Exploring resilience benefits in **project concept phase** –Allows better understanding of disaster risk to actual performance against other screening indicators, such as poverty reduction, gender equality.
- Taking disaster risk into account in **project preparation phase** (Detailed risk assessment, Environmental assessments, Economic appraisal)
- Adjusting **engineering design and standards** to reflect disaster risk

- **Climate risk project screening tool** currently being piloted (AWARE tool). Will provide information on current and potential future risk that could impact the success of the project.
- Future plan to expand the tool to include geophysical hazards

Standalone Investments to strengthen disaster resilience

What and How to choose investments ?

Image: AFP

- **Integrated approaches** than singular intervention is seen to be cost efficient
- **Balanced approach** - sustained attention to small scale in addition to extreme events
- “In the short-term, **investing in hazard forecasting and hydro-meteorological** early warning systems, **risk information**, can have high cost-benefit ratio with immediate and significant payoffs (WB,2013)”
- “In the medium- to long-term, striking the **right balance between investments in structural and non-structural measures** - “gray” concrete and cost-effective “green” infrastructure (WB 2013)”
- It is not all about new investments, **management of existing assets** - useful source to reduce risk. If infrastructure is well maintained and efficiently utilized, additional investments may be postponed and even avoided.

Benefits of Disaster resilient urban investments

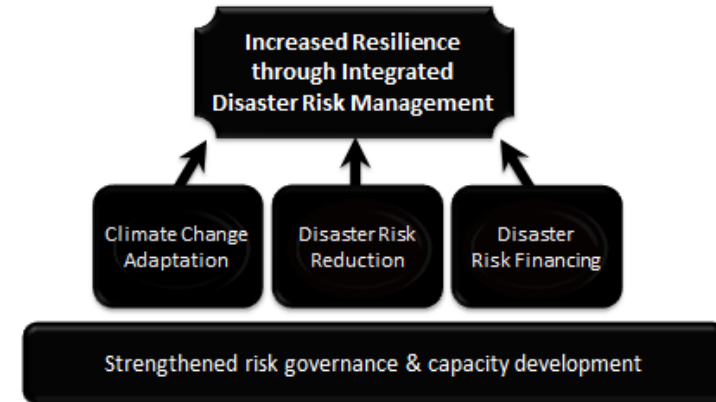
“Real cost of development investments is actually lower if disaster resilience is included”

(GAR 2009).

- In the form of **reduced potential losses** and reconstruction costs. Appropriately designed strategies represent sound investment that is central to alleviating poverty.
- With the uncertainties related to climate projections, investments in **disaster resilience take the form of “no-regrets”** minimum levels of adaptation to climate risk, seeking to address immediate risks and thereby, alleviating future ones.
- Influencing future decision making, identifying **fresh business opportunities**, and **incentivizing private partners** to invest in risk reduction

Disaster Risk Management at ADB

- **Disaster and Emergency Assistance Policy 2004**
- **Integrated Disaster Risk Management Approach (IDRM)**
 - Disaster Risk Reduction
 - Elements of Climate Change Adaptation
 - Disaster Risk Financing
- **IDRM Operational Plan currently under formulation.** DRM is captured in various sector and thematic plans such as **Water Operational Plan, Urban Operational Plan, Environment Operational Directions** etc.
- **Integrated Disaster Risk Management Fund** to address regional solutions on DRM for Southeast Asia – 5 years, \$10M
- Other funds such as **Water Financing Partnership Facility, Urban Change Resilience Trust Fund** (being prepared) have components of disaster resilience
- TA 7929- Addressing **disaster risk through land use management.** PPTA BAN coastal town **improvement project**
- TA 7812 and 8012, supporting **development of DRF solutions for cities** in Philippines, Indonesia and Vietnam. TA 8315 **Eq insurance pool** for PHI.



“Many development actions carry potential disaster risk but also provide opportunities to strengthen resilience and can become instruments for investing in resilience. The choice is ours.”

ADB, 2013

