

The Science and Practice of Urban Climate Adaptation: Challenges and Opportunities for Action

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Why Study Climate Adaptation in Cities?

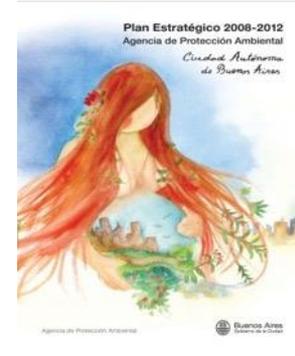
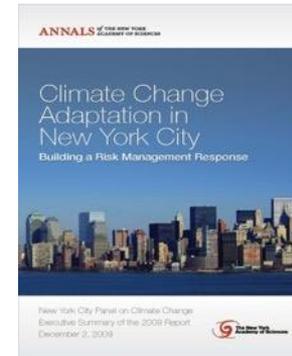
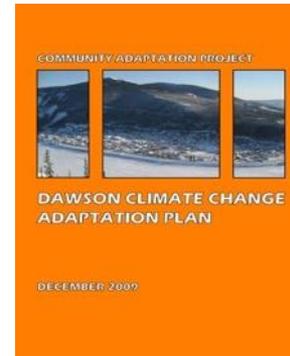
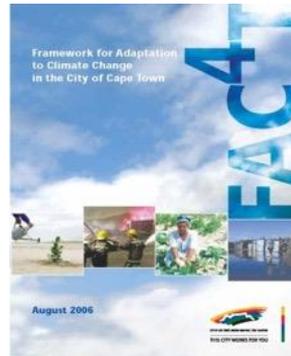
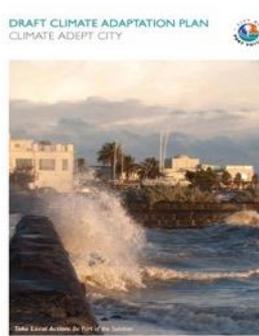
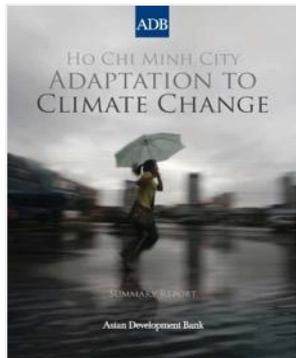
Climate change will disproportionately impact poor communities -- many of which are in cities -- because of their higher exposure to environmental hazards, lower response capacity, and lower access resources and services.

Integrating climate adaptation is key for facilitating responses to impacts and supporting development, but adaptation has a distinct 'logic'.

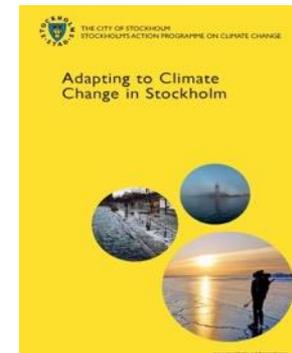
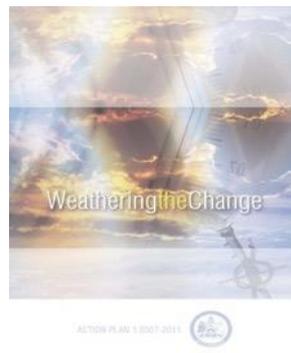
Cities and local communities are increasingly nodes (or 'laboratories' of climate adaptation and resilience action.



The Adaptation Imperative

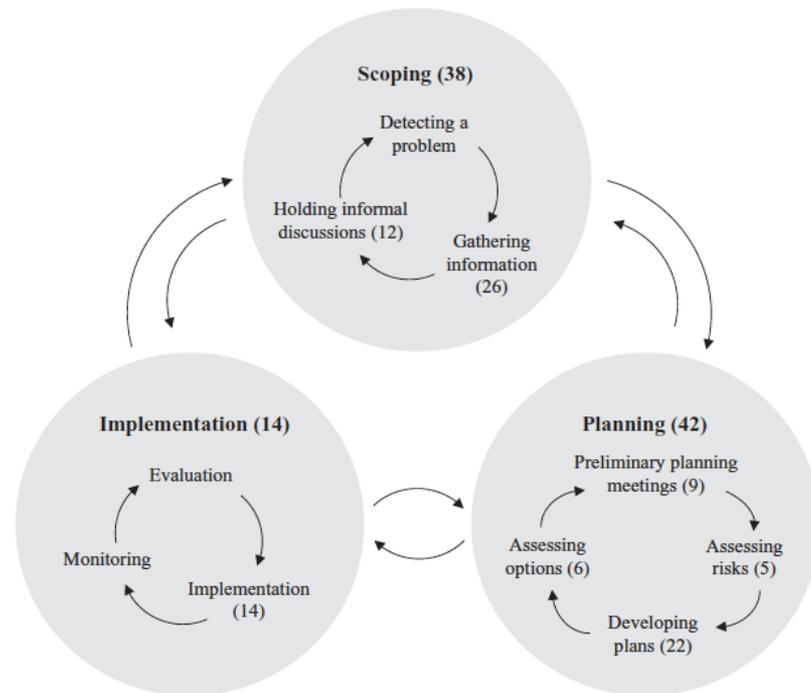


- Emphasis in cities has been on climate mitigation
- However, cities are recognizing the need to initiate adaptation planning and implement adaptation measures



The “Logic” of Climate Adaptation

- Draws on typical planning tools and strategies
- Relies on strong leadership
- Strong tendencies for experimentation and incremental change
- Mainly institutional in nature



Source: Shi, L, E Chu, & J Debats. 2015. “Explaining Progress in Climate Adaptation Planning Across 156 U.S. Municipalities.” *Journal of the American Planning Association* 81 (3): 191–202.



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Figure 1. Climate adaptation planning as an iterative process with feedback loops. Numbers in parentheses indicate the number of cities in our sample (out of 156) at each stage of the process.

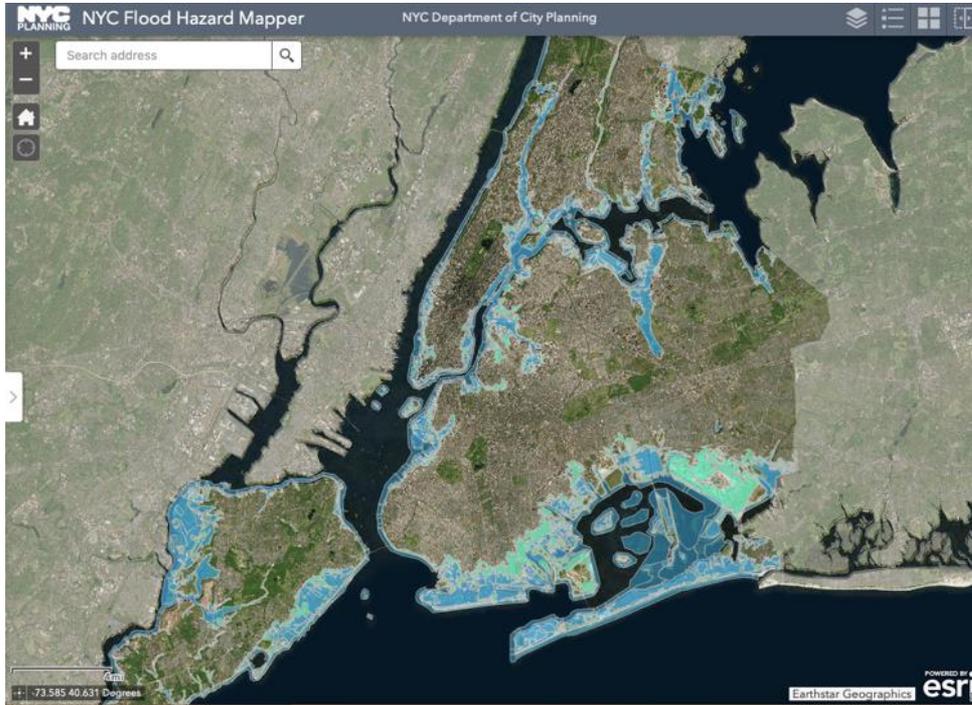
Source: Adapted from IPCC, 2014. © IPCC. Adapted by permission of IPCC. Permission to reuse must be obtained from the rightsholder.

However...

- We now have ± 10 years of experience in urban adaptation/resilience.
- There is growing global recognition of adaptation and resilience needs.
- We have moved from institutionalization to implementation.

Two Examples...

New York City



Layers showing future high tide in the 2020s, 2050s, 2080s, and 2100 are based on NPCC's projections for SLR in New York City.

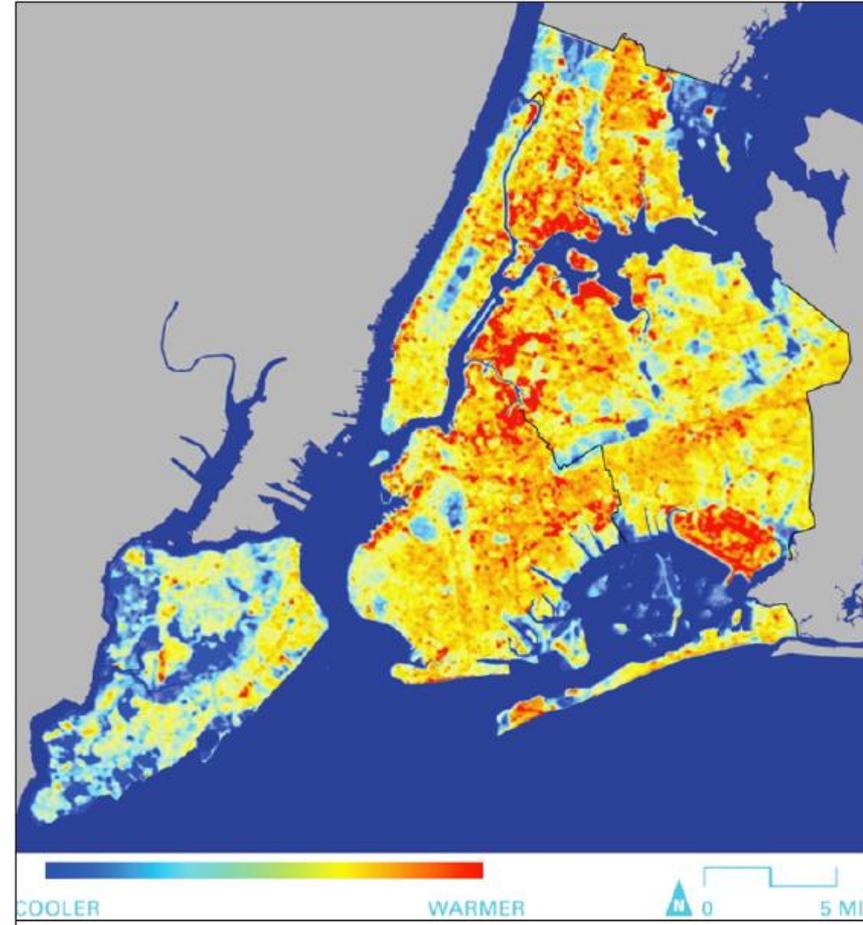
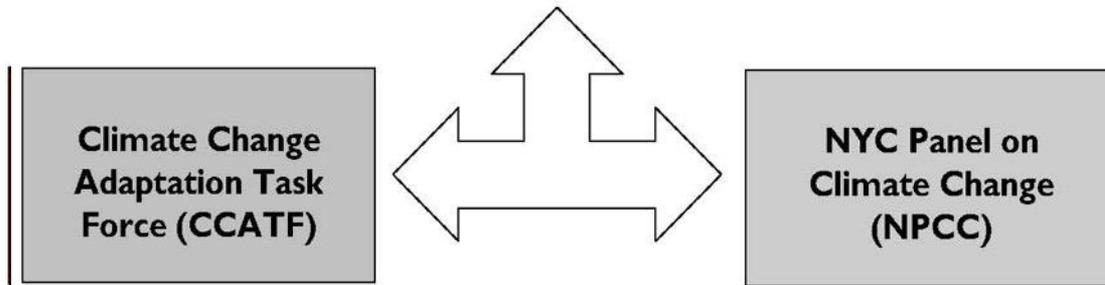


Figure 1: Some NYC communities experience higher temperatures than others. Variation in NYC's densely built environment results in disparate neighborhood-level risks. Source: LANDSAT Thermal Data, 2009.



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Task Force Creation in New York City



NPCC

Academia

- NASA/Columbia
- CISC/CUNY
- City Tech/CUNY
- Columbia – Lamont
- Columbia University
- NYU
- Rutgers University
- SUNY-Stony Brook
- Wesleyan/UCS

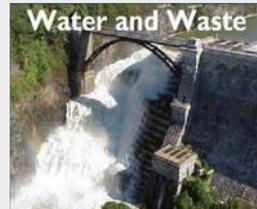
Private Industry

- AIG
- Hoguet Newman Regal & Kenney, LLP
- Oliver Wyman
- Swiss Re

CCATF

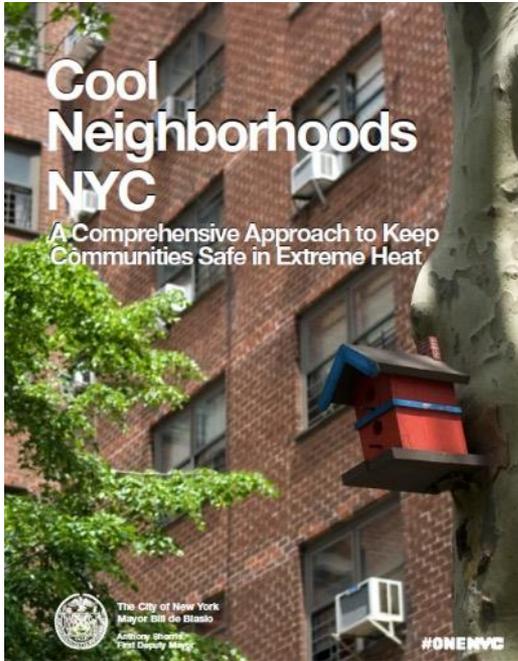
- 12 City agencies
- 5 Regional public authorities
- 6 State agencies
- 2 Federal agencies
- 15 Private companies

CCATF Working Groups



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Adaptation Strategies

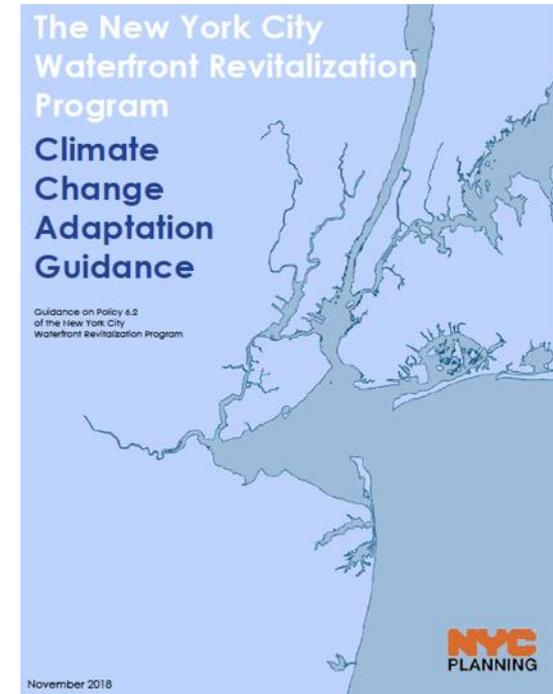


Dealing with **urban heat** through street trees, cool roofs, cool pavements, different kinds of green infrastructure, together with launching climate risk training in at-risk neighborhoods.

Revitalizing waterfronts by introducing building set-backs, permeable surfaces, strengthening and 'greening' coastal infrastructure.



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The 'Big U' or 'Dry Line'



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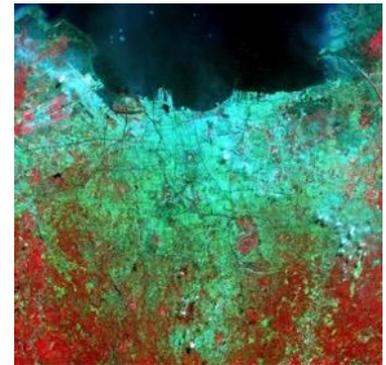
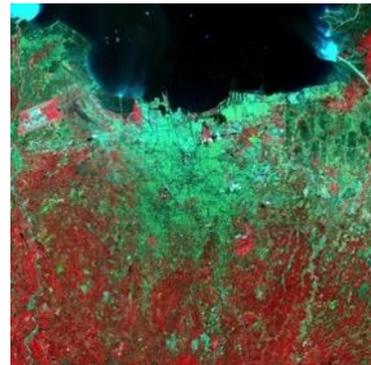
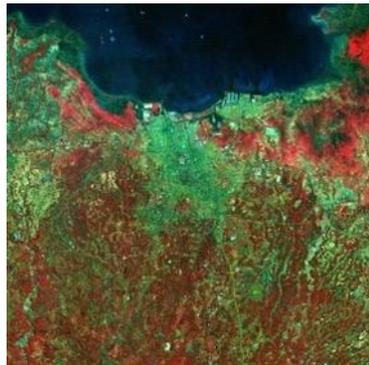


Jakarta, Indonesia

- Capital city experiencing high urbanization rates.
- Long history of land subsidence and urban inundation.
- City increasingly vulnerable to sea level rise.
- Capital region plan published in 2014. Then abandoned...



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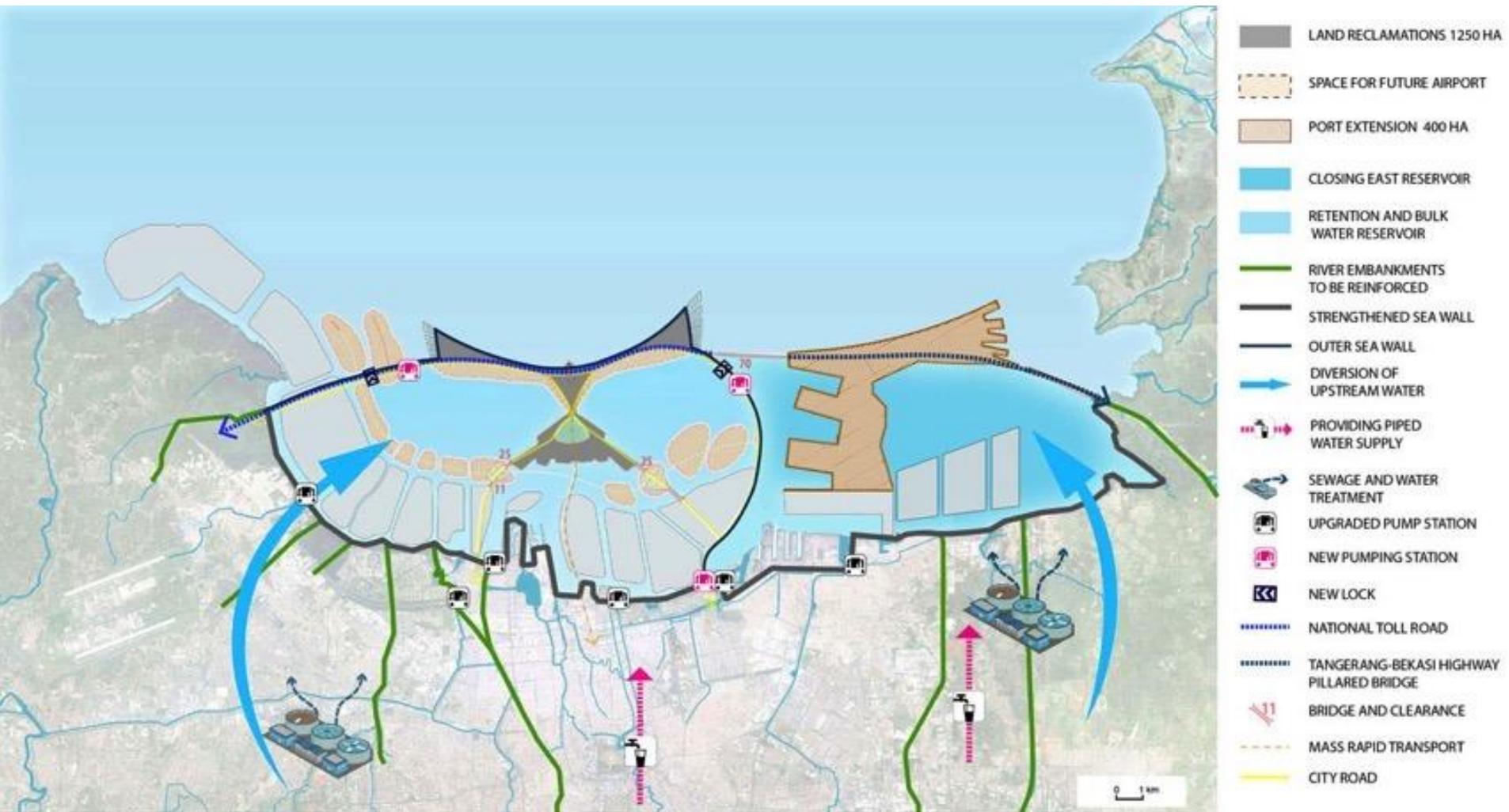
Jakarta Metropolitan Region, 1976, 1989, 2004 (NASA)



Source: Yosef Riadi for NPR



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Source: National Capital Integrated Development Plan (2014)

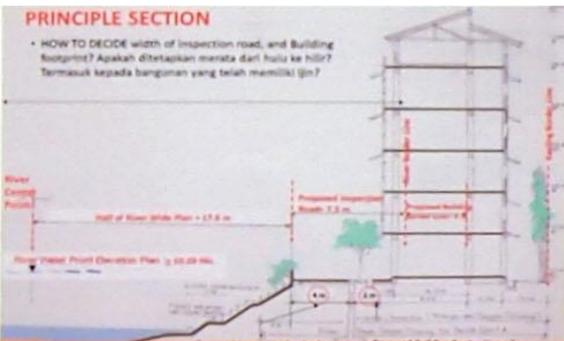


Another view...





Ciliwung Merdeka with researchers and residents of Bukit Duri and Muara Bara, July 2013 (photo credit: Kian Goh)



PROCESS OF CREATING SOLUTIONS BY AND FOR PEOPLE "Humanitarian-Growth Vertical Kampung"



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Ciliwung Merdeka's "humanitarian vertical kampung" design, part of Jakarta Vertical Kampung exhibition

Insights so far...

Visioning Resilient Urban Futures

The contesting narratives of change:

- Development for growth, productivity, investment, and security.
- Prioritizing livability and environmental ‘utopianism’.

A need to unpack the their sources, incentives, and consequences:

- The role of global capital (and speculative forms of technology).
- Real impacts on emissions reduction, risk management, and sustainability?



Example of Eko Atlantic City in Nigeria

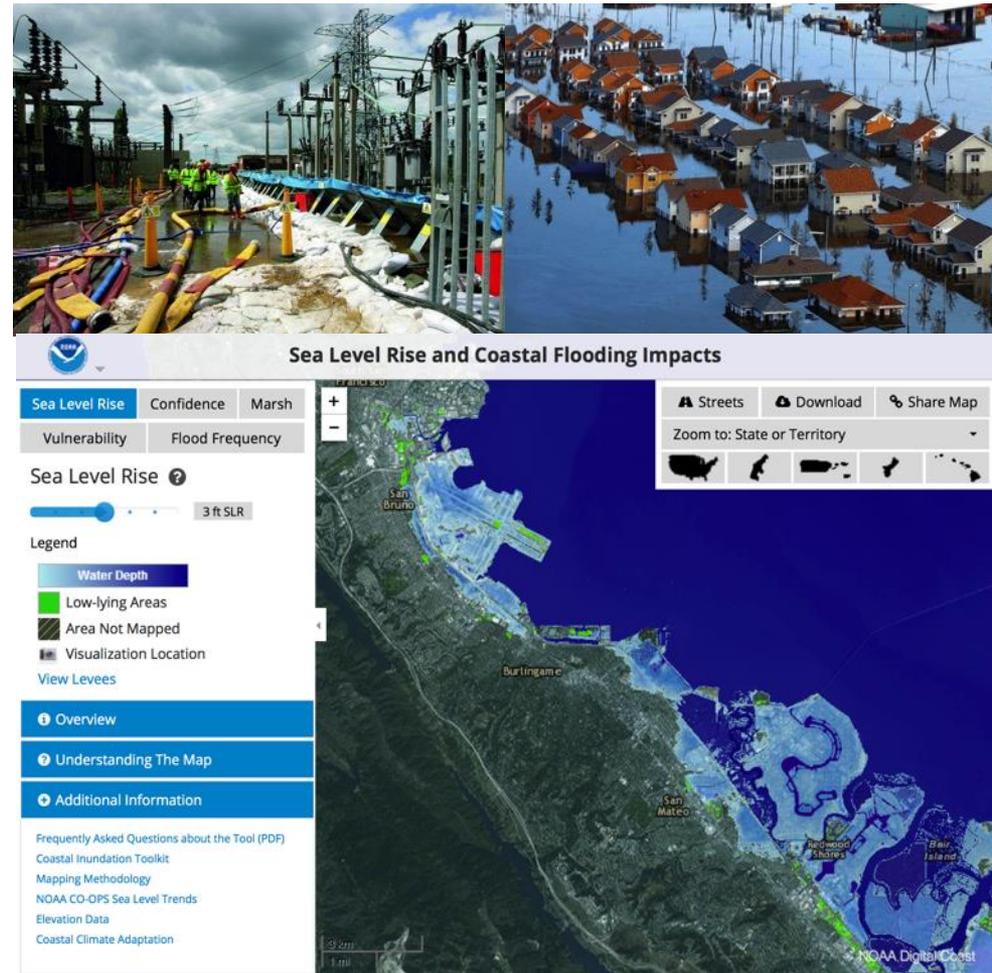
Reorienting Behaviors and Values

Enabling change through:

- Policy and legislative action
- Financial and social incentives
- Knowledge and awareness

Complexity derived from:

- Politics and ideology
- Values of urban system components
- Negotiating diverse (and likely conflicting) interests



Focusing on Fairness and Equity

Dealing with the ‘winners’ and ‘losers’ of adaptation action:

- Building inclusive participatory processes.
- Recognizing interests of the vulnerable and marginalized.
- (Re)distributing goods, infrastructures, and services.



What Does This Mean for Practitioners?

Climate adaptation entails deep societal, political, and cultural shifts.

- Diagnosing the drivers of *underdevelopment, vulnerability, and marginality*, but situating these local experiences in the context of environmental change.
- Adaptation actions are contentious, with conflicting visions of *what ought to be and how we should get there*.
- An opportunity for cities to radically rethink the structure of politics, economy, culture, and society (*and to position themselves in global conversations*).

Looking Forward...

Setting the parameters for pathways towards climate adaptation. Three entry points for discussion:

- What is the **vision** of adaptive/resilient cities and does this also support climate mitigation and environmental sustainability priorities?
- How do we **value** and **prioritize** climate adaptation actions?
 - In what ways do actions address structural drivers of vulnerability, poverty, and inequality?
 - How do we deal with conflicts that may arise?
- Which **voices** are recognized, validated, and included in the process?

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