

Smart and Resilient Urban Development for Green, Inclusive and Competitive Cities



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May 2015



AGENDA

PART 1

- Urban Challenges
- ADB's urban approach

PART 2

- Urban Resilience
- Smart Cities

"Our struggle for global sustainability will be won or lost in cities."
Barack Obama, 2009


Asia's urban challenges



Rapid Urbanization

between 2010 and 2050

Urban population of Asia will double



65% of Asia's population will be urban

Urban Poverty and Social Inequality



505 million people

Slum population in Asia-pacific region, 2010

Economy ↔ Environment



42.2% URBAN POPULATION
 80.3% URBAN GREEN COVER
 75.5% GHG EMISSIONS

The State of Asian Cities 2014/15

Environmental sustainability

- **Air pollution**
65% of urban air pollution mortality occurs in Asia
- **Solid waste management**
Only 10% of solid waste disposed in engineered sanitary landfills
- **Water supply**
412 million people without access
- **Wastewater treatment**
Ineffective systems in most Asian cities

Photo source: CDA

Vulnerability to Climate Change Impacts

In Asia-Pacific, sea level rise 30-60 cm by the year 2100

900 million urban dwellers, incl. 238 million urban poor, in low and middle income countries are at risk

Economic damage could be **\$55 billion per year** from 2010 to 2050

Photo source: CDA/ADB Guide

Urban Finance and Governance

- Access to finance
- Gaps in decentralization
- Lack of integrated planning

Photo source: CDA/ADB Guide

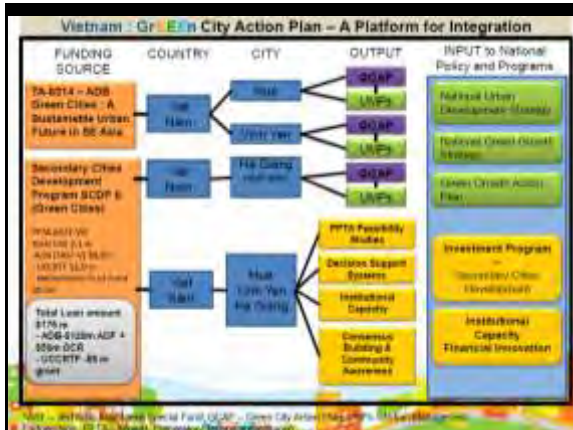
ADB's urban approach

Competitive – Inclusive – Green

Cities

ADB's Urban Operational Plan 2012-2020.





ADB's assistance: Finance++

Finance + Partnerships + Knowledge

- Total urban lending **\$24 billion**
- Annual operations (2014) **\$22 billion (urban: 1.7 billion)**
- Annual Technical Assistance (2014) **\$300 million (urban \$18 million)**
- Annual co-financing (2014) **\$8.7 billion**

Finance++ Project Examples

Renewable Energy	<ul style="list-style-type: none"> • Wind Power Generation: PRC, India, Pakistan, Thailand • Solar Power Generation: PRC, India, Pakistan, Thailand • Small/Wind Hydro Power Generation: PRC, Nepal, Viet Nam • Biomass/biogas: PRC, Thailand, Viet Nam
Energy Efficiency and Conservation	<ul style="list-style-type: none"> • Efficient lighting/buildings: PRC, Nepal, Pakistan, Philippines, Thailand • Power plant efficiency (combined cycle gas turbine plants): Thailand, Uzbekistan, Vietnam
New technologies/innovations	<ul style="list-style-type: none"> • Efficient water supply: Armenia, Kyrgyz Republic, Uzbekistan, Viet Nam • Carbon capture and storage: PRC, Carbon Integrated Industries, Combined Cycle Power Plant
Smart cities/Transport and Urban Development	<ul style="list-style-type: none"> • Big capital transit systems: London, Tokyo, Taipei, Paris, Bogota, Viet Nam, Shanghai, Taipei, Chengde • Metro projects: Singapore, Seoul, Beirut, Mexico, Tallinn • Railways: Guatemala, Doha, QATAR, India, Indonesia • Urban infrastructure: Harbin, Shanghai (PRC) • New urbanized transport and integrated urban transport: Seoul, Kathmandu, and Vietnam • Efficient urban heating: PRC • Airline reduction (noise-to-energy): PRC
Urban Resilience	<ul style="list-style-type: none"> • Pilot REDD+/Forest Investment Program: PRC, GMS, Indonesia, Philippines

Addressing Financing Constraints

- Improve local revenue generation
- Improve creditworthiness
- Develop bankable projects
- Mobilize Public-Private Partnerships
- Provide confidence to private sector investors.

Urban Financing for Local Governments

- **Traditional fund sources**
 - Central government remittances
 - Official development assistance
 - Local financial institutions
 - Taxes and fees
- **Off budget sources**
 - City-owned assets
- **Public Private Partnerships**
 - Agreements with private sector
 - Concessions to invest and manage certain public infrastructures
- **Non-traditional financing**
 - Bond financing
 - Guarantees



Photo source: images.google.com

ADB's Urban Finance Options

ADB Internally-Managed Funds

Fund Name	Amount (USD)
Urban Climate Change Resilience Trust Fund	140
Urban Environmental Infrastructure Fund	21
Urban Infrastructure Fund	5
Urban Water and Sanitation Fund	4
Urban Transport Fund	2
Urban Affordable Housing Fund	2
Urban Skills Development Fund	1
Urban Digital Infrastructure Fund	1
Urban Public Works Fund	1
Urban Waste Management Fund	1
Urban Health and Nutrition Fund	1
Urban Green Building Fund	1
Urban Smart City Fund	1
Urban Climate Change Resilience Trust Fund	1
Urban Environmental Infrastructure Fund	1
Urban Infrastructure Fund	1
Urban Water and Sanitation Fund	1
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Urban Green Building Fund	1
Urban Smart City Fund	1



Photo source: ADB

Cities Development Initiative for Asia



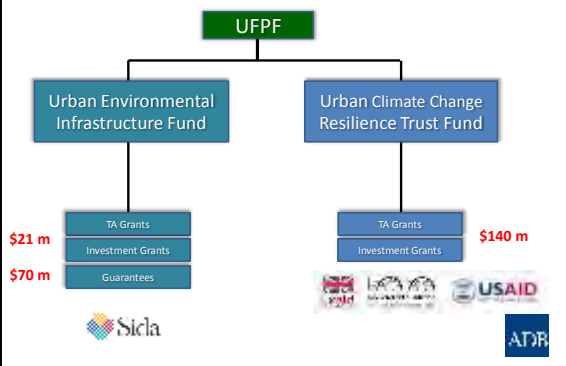
Photo source: CDIA

CDIA: Scope and approach

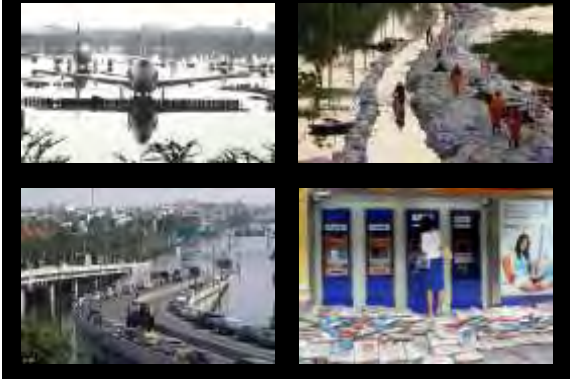


Photo source: CDIA

Urban Financing Partnership Facility



NOT resilient

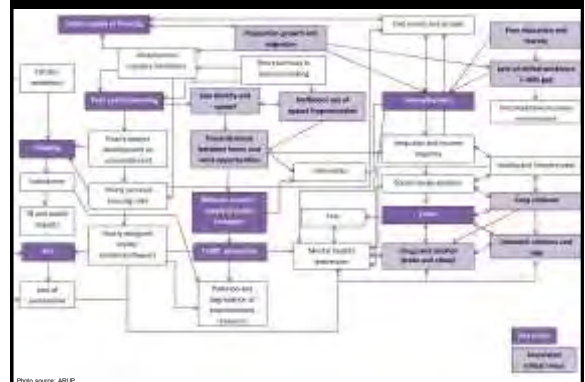


Urban resilience is the **capacity** of individuals, communities, institutions, businesses and systems in **cities** to **survive, adapt, and grow** in the face of **stress** and **shocks**, and even **transform** when conditions require it.

Cities face a broad spectrum of shocks & stresses



Cape Town: Critical shocks and stresses



Elements



Elements + Boundaries



Elements + Boundaries + Behaviors

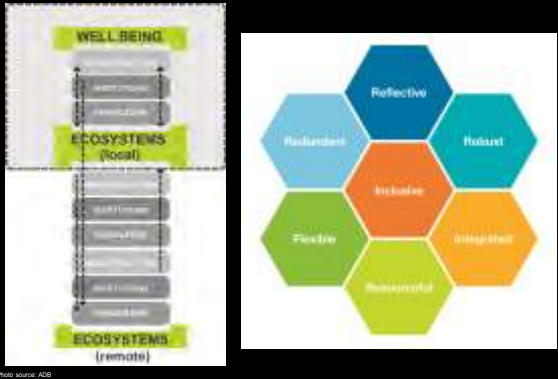


Photo source: ADB

Case Study: Van, Turkey



Photo source: S. Karaman

Case Study: Van, Turkey



Photo source: S. Karaman

A resilient city requires...

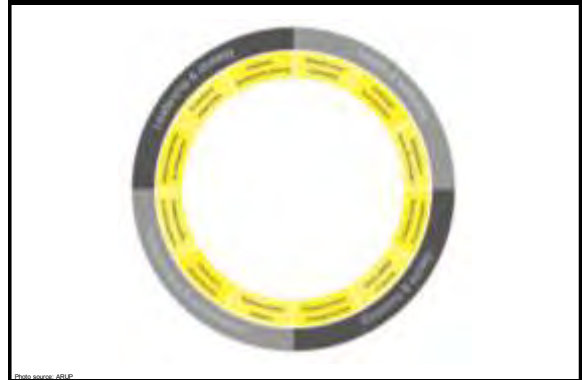


Photo source: ADB

Health & Well-being

The diagram for Health & Well-being features a circular graphic on the left with the text 'People' and the definition: 'the health and wellbeing of everyone living and working in the city'. To the right, three key factors are listed with corresponding images: 'Minimal human vulnerability' (image of a person), 'Diverse livelihoods and employment' (image of people working), and 'Adequate safeguards to human life and health' (image of a person in a medical setting).

Photo source: ADB, S. Karaman

Economy & Society

The diagram for Economy & Society features a circular graphic on the left with the text 'Organisation' and the definition: 'the social and financial systems that enable urban populations to live peacefully, and act collectively'. To the right, three key factors are listed with corresponding images: 'Collective identity and mutual support' (image of a group of people), 'Social stability and security' (image of people in a public space), and 'Availability of financial resources' (image of a 'HAVE BAR' sign).

Photo source: ADB, S. Karaman

Infrastructure & Environment

Place
"the man-made and natural systems that provide critical services, protect and connect urban citizens."

- Reduced physical exposure and vulnerability**
- Continuity of critical services**
- Reliable communications and mobility**

Photo source: ARUP, S. Kamran

Leadership & Strategy

Knowledge
"informed, inclusive, and integrated decision making"

- Effective leadership and management**
- Empowered stakeholders**
- Integrated development planning**

Photo source: ARUP, S. Kamran

Why does urban climate change resilience matter?

Photo source: ADB, Unfooted Asia

Frequency of Asia's Flooding (1980-2013)

Year	Frequency
1980	22
1981	27
1982	27
1983	27
1984	27
1985	27
1986	27
1987	27
1988	27
1989	27
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2010	27
2011	27
2012	27
2013	27

Why does urban climate change resilience matter?

- Rapid urbanization -> expansion of urban squatters
- Inefficient infrastructure and management practices
- Focus on engineering solutions -> it's not wrong but not enough
- Weak land use planning and design -> lack of holistic long-term thinking
- Changing hazard profiles due to climate change

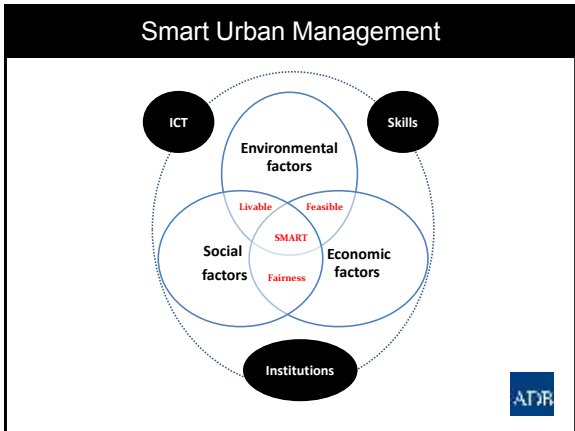
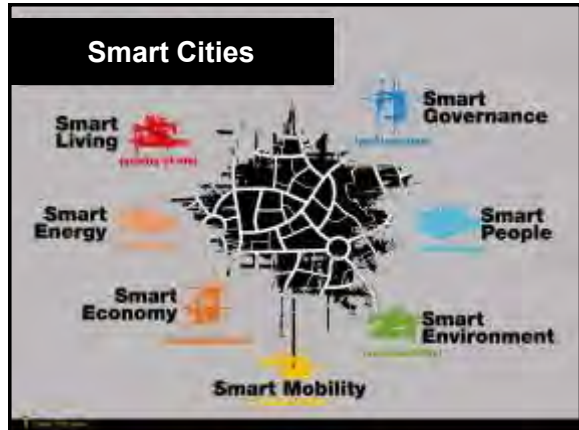
Photo source: ADB, Unfooted Asia

UCCR Analytical Framework

Photo source: ADB

Example: UCCR Strategy

IMPACTS	SHORT TERM	MEDIUM TERM	LONG TERM
Water Supply	-Water conservation practices -Monitoring water quality	-Hardening water supply infrastructure -Review of objectives for UKAI Dam	-Exploring alt water sources -Execution of balloon barrage
Waste Water/ Sanitation	-Sustaining networks & industrial use	-Increasing treatment capacity -Separating combined flows -Energy production	-Increasing, upgrading & hardening infrastructure
Flood Management	-End-to-end early warning system -Information & data mgmt	-Mapping flood risk & regulations of construction in flood plains	-Diversion of water from River Tapi
Landuse & Planning	-Green buildings & inducing thermal comfort -Water bodies & urban environment	-Density & open space, green belts -Residential density	-Decentralization -Slum free city -Future development
Solid Waste	-Continuous monitoring -Awareness	-Waste segregation	-Decentralized solid waste
Transport	-Peak hour traffic mgmt -Public transport	-Controlling personal vehicles -Preventing encroachments	
Public Health	-Improving surveillance system	-Anticipate problems (e.g. biological controls) -Infrastructure for weaker sections	-Indoor thermal comfort
Social Cohesion/ Equity	-Developing local level agencies -Awareness & community dialogue	-Image & conflict resolution	-Educate
Institutional Framework	-Developing staff skills & new technology -Active community participation	-Innovative working models & intervention of private sector -New policies & governing mechanisms	
Energy	-Demand side mgmt -Energy infrastructure -Future indicative energy measures	-Demand side mgmt -Energy infrastructure -Future indicative energy measures	-Demand side mgmt -Energy infrastructure



Smart Solutions

VIENNA

2 million households

50 thousand smart meters

18 driving Astar hybrid smart grids of the City of Vienna generate the electricity power for some 60,000 households.

TORONTO

10% → 15t REDUCTION CO₂

smart vehicles

They save 20% of the cost of Toronto's Power Generation and reduce annual greenhouse gas emissions by 100,000 tonnes. (Data source: The City of Toronto, 2008-2012).

BERLIN

550 smart meters

They bring 10% of the electricity demand and of household energy consumption to the grid.

PARIS

20,000 BICYCLES

located every 300m 24/7

They allow anyone to use the City of Paris, anywhere, 24/7, at any time in 2,800 bicycle stations located over 300 meters.

ADB Projects with smart components

Sector	Activities
Integrated Disaster Risk Management	<ul style="list-style-type: none"> Satellite imagery and remote sensing for an exposure database Flood warning dissemination and monitoring systems Hydrological simulation models Open street maps increasing community awareness on disaster risk and facilitate post-disaster response
Urban development	<ul style="list-style-type: none"> Land use maps ICT skills training GIS-based municipal information systems and maps Revenue and asset management systems
Urban Services: water supply, sanitation, solid waste management, health	<ul style="list-style-type: none"> Computerized financial and customer relations management GIS mapping (soil cover, saline intrusions to ground water etc.) Web-based utility management systems Satellite imagery Virtual Medical Services
Transport	<ul style="list-style-type: none"> Smart mobility concepts for sustainable urban transport Intelligent transport systems (ITS) Bus Rapid Transit
Energy	<ul style="list-style-type: none"> Supervisory control and data acquisition systems Smart power grids



