Rapid Urbanization: Challenges and Opportunities for Planning in Asian Cities

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Outline of Presentation

The Global Perspective
The Indonesia Case
Jakarta’s Rapid Urbanization Epochs
What Is Driving the Current Epoch
Challenges/Responses to Rapid Urbanization
Smart City/Green City in Asia
Planning Responses
Characteristics of Rapid Urbanization

Population Growth

Spatial Expansion of the Built Environment

Ongoing Infrastructure Developments
Global Rapid Urbanization

1.5 million people are added to the global urban population every week

Source: PwC analysis (United Nations Population Division (2014))
Urban Agglomerations, 500,000 or more
Watercity to Megacity
1619 - 2019
Jakarta region grew in the 20th century from about 150,000 in 1900 to about 30 million in 2014.
## Table 1. Population Metropolitan Region of Jakarta 1980-2010 (in millions)

<table>
<thead>
<tr>
<th>Area</th>
<th>1980</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>6.50</td>
<td>8.26</td>
<td>8.39</td>
<td>9.60</td>
</tr>
<tr>
<td>Jakarta</td>
<td>6.50</td>
<td>8.26</td>
<td>8.39</td>
<td>9.60</td>
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<tr>
<td>Inner peripheries</td>
<td>n.a</td>
<td>n.a</td>
<td>4.93</td>
<td>7.22</td>
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<tr>
<td>City of Tangerang</td>
<td>n.a</td>
<td>n.a</td>
<td>1.33</td>
<td>1.80</td>
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<td>City of South Tangerang</td>
<td>n.a</td>
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<td>0.80</td>
<td>1.29</td>
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<tr>
<td>City of Depok</td>
<td>n.a</td>
<td>n.a</td>
<td>1.14</td>
<td>1.75</td>
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<tr>
<td>City of Bekasi</td>
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<td>n.a</td>
<td>1.66</td>
<td>2.38</td>
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<td>Outer peripheries</td>
<td>5.41</td>
<td>8.88</td>
<td>7.31</td>
<td>11.20</td>
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<tr>
<td>City of Bogor</td>
<td>0.25</td>
<td>0.27</td>
<td>0.75</td>
<td>0.95</td>
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<tr>
<td>Tangerang Regency</td>
<td>1.53</td>
<td>2.77</td>
<td>2.02</td>
<td>2.84</td>
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<tr>
<td>Bekasi Regency</td>
<td>1.14</td>
<td>2.10</td>
<td>1.62</td>
<td>2.63</td>
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<tr>
<td>Bogor Regency</td>
<td>2.49</td>
<td>3.74</td>
<td>2.92</td>
<td>4.78</td>
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<tr>
<td>Megacity of Jakarta</td>
<td>11.91</td>
<td>17.14</td>
<td>20.63</td>
<td>28.02</td>
</tr>
</tbody>
</table>
Peripheral Expansion in Indonesian Cities

Population growth is primarily in **periphery**, not in core city.

<table>
<thead>
<tr>
<th>Metro name</th>
<th>2005</th>
<th>CAGR 1995 - 2005</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Core</td>
<td>Periphery</td>
</tr>
<tr>
<td>Jakarta</td>
<td>8,820,603</td>
<td>12,799,559</td>
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<tr>
<td>Surabaya</td>
<td>2,611,506</td>
<td>5,974,090</td>
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<tr>
<td>Bandung</td>
<td>2,270,969</td>
<td>5,079,430</td>
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<tr>
<td>Semarang</td>
<td>1,446,533</td>
<td>4,335,017</td>
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<tr>
<td>Medan</td>
<td>2,029,797</td>
<td>1,812,196</td>
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<tr>
<td>Palembang</td>
<td>1,369,239</td>
<td>1,122,731</td>
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<tr>
<td>Makassar</td>
<td>1,194,583</td>
<td>1,106,362</td>
</tr>
<tr>
<td>Denpasar</td>
<td>574,610</td>
<td>1,208,004</td>
</tr>
</tbody>
</table>

Source: Indonesia Bureau of Statistics (BPS)
Built up Area of Semarang 1972-2009
Toll Roads and Expanded Urban Area
Major Epochs of Rapid Urbanization in Jakarta

1950s - 1960s - Rural Migration to the new capital; insufficient infrastructure
1980s - 1990s - Massive built environment expansion, fueled by business expansion, speculative development and deregulation
2010 - Present -- Renewed Speculative Development and Spatial expansion
Characteristics of Current Growth Epoch in Asian Cities

Aggressive housing construction in large-scale and increasing high-rise structures
Massive new malls and “town centers” especially in peripheral locations
Increased investment in infrastructure, including public transit
Even greater increase in car, motorcycle and truck traffic
Continuing infrastructure deficits affecting millions of inhabitants
Serious environmental deficits continue as reflected in flooding
Does the New Urban Form of Indonesian Cities Offer a Way to Accommodate Sustainable Rapid Growth?
Challenges and responses to rapid growth in the 1950s and 1960s epoch in Indonesia
Sukarno - Modernist Planner
Hotel Indonesia - Modernism
Kebayoran Baru
New Order “Family” Planning
Automobile Metropolis
Toll Roads and the New Order
Suburban Enclaves - Bumi Sepong Damai
Mass Transit - Busway - 2004
Busway - Mass Transit
Spatial Plan and Politics
Fauzi Bowo, Governor, 2007-2012

HIGHLIGHTS OF FAUZI BOWO’S ACHIEVEMENTS

- Increasing the number of TransJakarta bus passengers in Corridors 1, 3, 5 and 6 by around 18 percent from 148,097 after preparing the exclusive lanes in July 2010.
- Major inundations eliminated in 16 locations out of 78 locations.
- Reducing flooding in main streets in 33 locations of 106 in 2010.
- Reducing the use of groundwater from 20 million cubic meters to 8 million cubic meters as of August 2010 by imposing a gubernatorial decree on groundwater tax.

SOURCE: JAKARTA ADMINISTRATION
Modeling sustainable and transit-oriented world class city
What were the key challenges that confronted the Indonesian city?
2007 Flood - The Great One in Jakarta
1996-2007 Flood Impact Areas

Land Subsidence Map - Jakarta

Subsidence map of Jakarta 1974-2010:
Total subsidence -25 up to -400 cm ; rate -0.5 up to -17 cm/year

First recorded of leveling data were in 1974. Base on accumulated data, interpolation and extrapolation we can make subsidence map of Jakarta from year 1974 up to 2010.

Base on latest analysis of piezometric surface data found that initial condition of subsidence were probably on 1965. In this case in the near future we will try to modeled subsidence map of Jakarta for year 1965 up to 2011.
Recent Flooding in Makassar
Flood in Baleendah District, Bandung
Flooding in Semarang
Flooding of Phnom Penh
President Jokowi as Governor

“The Ciliwung River must be restored to its original size and purpose....”
Why is water so important for Jakarta?

- Historically of the city connected to its natural water ways
- Growth of city has swept over the ecological structure of the area, including the entire river system
- Acceleration of flooding, increased land subsidence, inadequate clean water, inadequate management of waste water, and environmental destruction
- Severely limited recharge of aquifer and surface water sources despite extensive rain as urban moves inland
- Waterfront has become the new development zone through land reclamation
Pantai Mutiara - Pluit
Jakarta Watershed - 13 Rivers
Jokowi Plan to Boost Green Space in Jakarta
Pluit Reservoir Revitalization Project
Land Reclamation

3000 ha, investment by private sector
Building cost 200 US/m²
Current land price (Kapuk) 2000 US$/m²
Estimated net profit: 30 billion US$
Public – Private – Partnership
Required for Safety and Transportation
Land Reclamation and Coastal Defense System - Jakarta
Traffic Management Challenge: The Daily Commute
Traffic Phnom Penh Style
MRT Plan from 1990s Becomes a Reality
Jakarta MRT - Opening March 2019
Riding the MRT in Jakarta
Light Rail System Unveiled
Jakarta Light Rail
Jakarta-Bandung High Speed Rail
JAVA HIGH SPEED RAIL
Coping with Flooding
Jakarta Urgent Flood Project
Jakarta Urgent Flood Mitigation
Kali Semarang Polder
Ciliwung as it passes Bukit Duri
Manggarai along the Ciliwung
Central Java has cleared 4000 hectares of slums since 2014 (57% of total), especially along its waterways - By 2024 no slums

Jakarta Post
April 1, 2019
Citarum River Pollution
Jakarta’s Emerging Peri-Urban Centers
Fatmawati City Center
South Quarter - A Peri-Urban Center
Boskalis - Losari Beach
Diamond Island - Phnom Penh
Where Has Planning Taken Jakarta?

- Has shaped an auto dependent megaurban region
- Paved and built over the basic ecological footprint
- Continued densities of commercial and residential leave opportunity for transit
- Recognition of waterfront as an investment and as a protector
- Inner city increasingly affluent, the edges are affluent and mix of poor and middle class
- Poor water/sanitation management threatens to overtake traffic management as the greatest challenge
Rise of the Smart City Movement
Bandung Smart City
SMART CITY - MAKASSAR
Semarang SMART CITY Objectives
Surabaya’s Architect-Mayor Supports Heritage
The 3rd Indonesia International Smart City Expo & Forum
17 - 19 July 2019
Jakarta Convention Center, Indonesia
Transport in the SMART CITY
SMART TRANSPORT- PETE-PETE
BRT in Semarang
Ecological Approaches for Smart Cities

“...urbanization patterns and population and development pressures...are placing ever more people and property in harms way [and] these development patterns impact and disrupt the ecological patterns of natural systems, [and] the ability of [the] environment to mitigate and absorb the likely impacts of flooding, storms and sea level rise...”

Land reclamation along the coastal area
Vision to create a “World City” and “Gateway to Eastern Indonesia
SMART City
Growth of outer districts faster than center
Water management challenges given dispersed settlements
Continuing challenge of 58,000 slum households
SMART APPROACHES TO GREEN URBANISM

- The Renewable Energy City - reduces non-renewables (Singapore, Taiwan, China)
- The Bioregional Carbon Neutral City (India, Singapore)
- The Distributed City (Jakarta’s Lippo Village)
- The Biophilic City (Singapore)
- The Eco-Efficient City (Bekasi City)
- The Sustainable Transport City (Yogjakarta)
What to do to create an integrated sustainable metropolis of 30 million, or a medium metropolis of 3-5 million?
Sustainable Mobility

- Continue to invest in high/volume and high speed public transit
- Disincentivize auto use by making it more expensive to use regularly
- Add new inter-center transit linkages
- Link existing new social housing w/transit
Sustainable Human Settlements

- Bring private sector/non profits into social housing in conjunction with public transit - that is, “transit-oriented development” for the public
- Develop and enforce planning for new urban centers that have mixed uses and mixed income housing
- Provide community-based infrastructure to existing settlements to upgrade services
Sustainable Environment

- Regulate inputs into the two most important rivers in Jakarta metro- Citarum and Ciliwung
- Utilize river dredging not only to address flooding issue but also the create urban greenways and public parks
- Make waste management, solid and sanitary, the top priority for improvements in existing local in settlements
- Make clean cheap water accessible to all
Key Characteristics of the SMART CITY

- Data-driven decisions about planning and management of cities
- Inclusion of ecological values in planning and management decisions
- Urban experts connected to best practices globally
- Local power to innovate and implement
- A socially and economically inclusive planning and decision process
- Ensuring healthy and comfortable communities
- Linking the parts of the city together in an efficient way
"Surabaya offers all its municipal services electronically... Some services can be accessed through smartphones, such as issuing licenses or applying for birth or death certificates. However, the concept of a smart city does not stop there. The most important thing is how a city can make its citizens feel happy, peaceful and comfortable. In addition to creating parks and urban forests—as well as enforcing health and cleanliness in the kampongs so that the people can feel more comfortable—Surabaya has more than 1,000 libraries and more than 36 broadband learning centres, places where people can learn how to use information technology. I also believe that a smart city should be safe. For that reason we have installed CCTVs in various spots... so that the people of Surabaya can feel safe."
Asia Can Have “Smart,” “Green,” and “Sustainable” Cities For ALL
Thank You!