

# IUPWARE Alumni Event

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*The sinking Jakarta: The socioecological crisis of land subsidence and the flood infrastructure fix*

# Participant

- Bachelor: Geological Engineering, Gadjah Mada University, Indonesia (2015)
- Master: IUPWARE (2010-12)
- PhD: Integrated Water System Science, UNESCO-IHE & University of Amsterdam (2015-2019)

# Theoretical framework of urban crisis

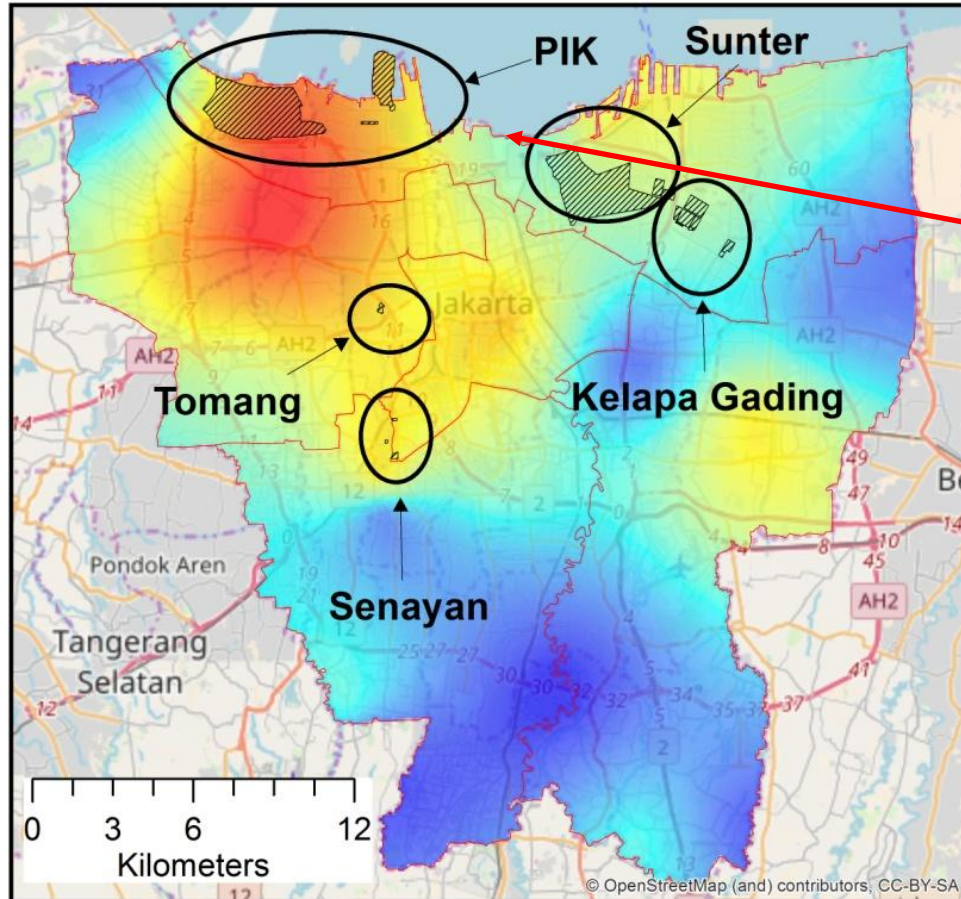
- Urban crisis of land subsidence due to the condition of underproduction (of geo-pressure, of groundwater head, minimum recharging)
- Sociospatial articulations of the causes: concentrated and extended urbanization
- Concentrated urbanization: the horizontal pattern of the city
- Extended urbanization: deep groundwater wells (urbanization of groundwater)

# New Order Authoritarian Regime of Indonesia 1965-1998

- Military regime
- Repressive control of freedom of expression with army and police
- Concentration of economic and political power

# I. Urban Crisis of land subsidence

## Land subsidence in Jakarta 1997-2005



Subsidence [cm]      Converted green area



Photo: Colven 2017

# I. Urban Crisis

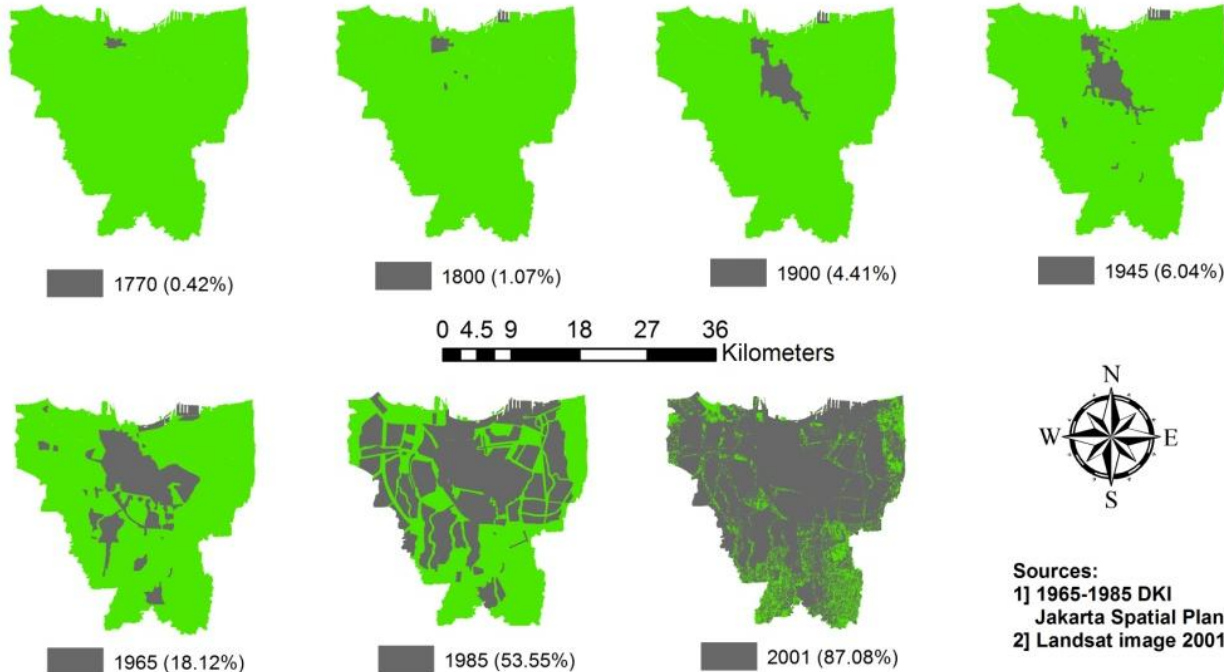
## ❑ Contested causes of land subsidence

1. Weight of buildings
2. Excessive extraction of deep groundwater
3. Tectonic activity
4. Soil compaction

# I. Urban Crisis: horizontal growth of the city

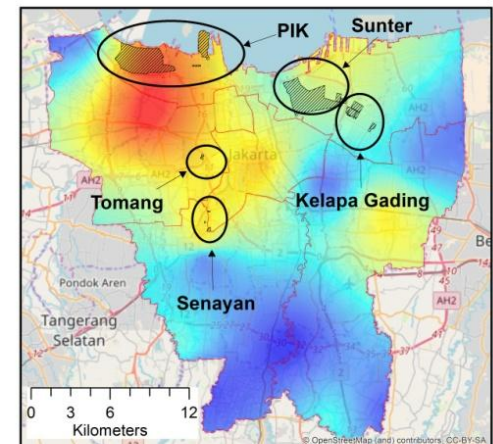
- Rapid expansion of built-up area, especially since 1965
- Conversion of around 4,000 hectare of green area by network of New Order crony capitalism
- New Order Indonesia: dictatorial regime 1965-1998

BUILT-UP AREA IN DKI JAKARTA, 1770-2001



Sources:  
1] 1965-1985 DKI  
Jakarta Spatial Plan  
2] Landsat image 2001

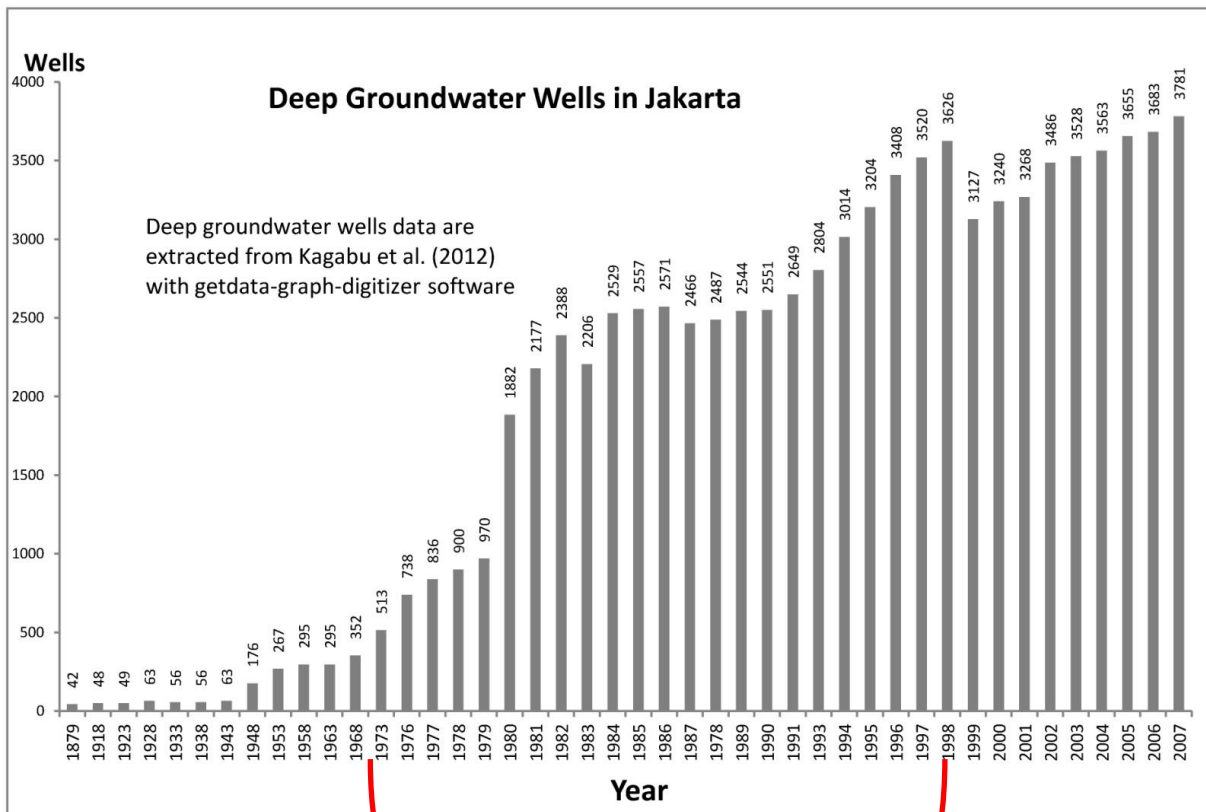
Land subsidence in Jakarta 1997-2005



Subsidence [cm] Converted green area

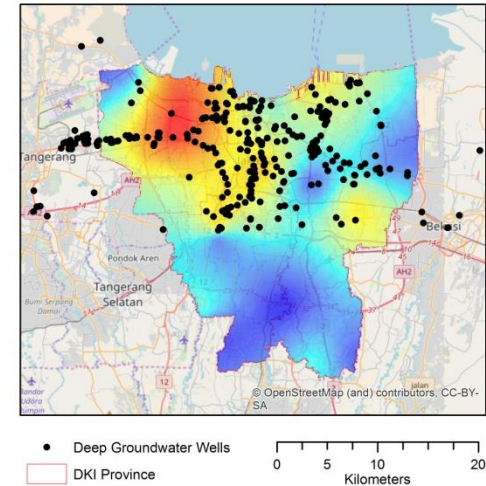


# I. Urban Crisis: deep groundwater extraction



New Order Regime

**Deep Groundwater Wells**



- Deep wells (> 40 m depth) cause land subsidence
- Deep wells are expensive
- The majority of deep wells are owned by commercial and government buildings



## II: Theoretical framework of urban fix

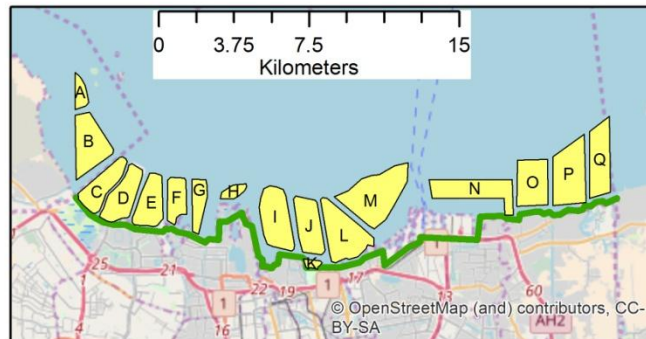
- In a time of socioecological crisis (of overaccumulation/overproduction, underproduction), spatial fix is a way to secure the condition of accumulation
- Spatial fix is geographical expansion, looking for new area for development, labour, and raw materials
- Flood infrastructure development is a sort of “spatial fix” (urban fix)

## II: Urban fix: flood infrastructure

### ❑ The solution (the fix):

- Giant flood infrastructure in Jakarta Bay accompanied by water treatment plant to supply drinking water and land reclamation
- Will evict around 50,000 fisher folks
- Requires around 330 million cubic meter filling materials (Cement, sand, rocks)

# II: Urban fix: flood infrastructure



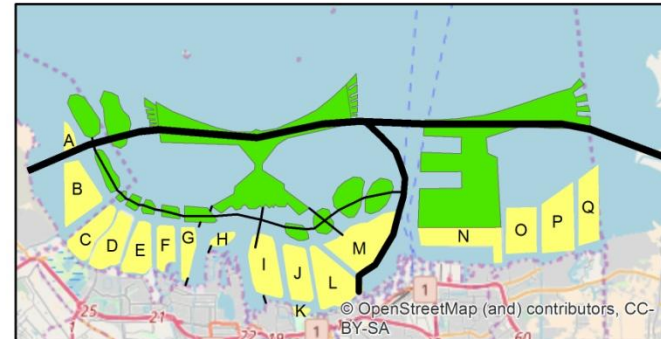
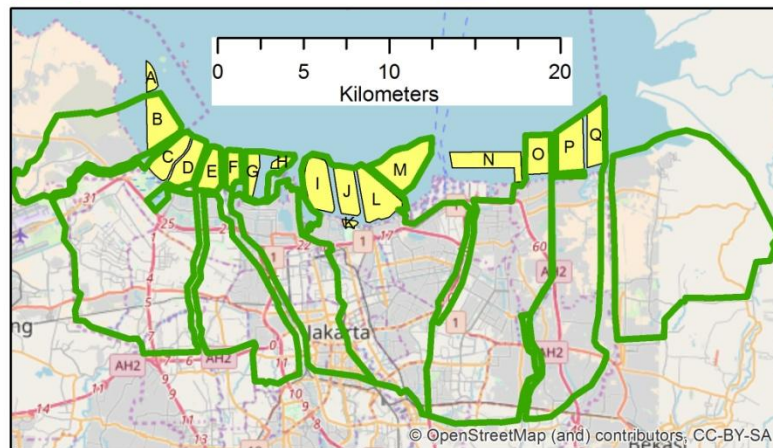
— Planned dike at JCDS Scenario 1 17 islands

Sources:

- 1) JCDS 2011
- 2) NCICD Master Plan 2014
- 3) Updated NCICD 2017
- 4) PT Taman Harapan Indah (2015: I-10)



— Extended polder at Updated NCICD 17 islands



17 islands NCICD's Reclamation — Sea wall

Island	Area [Ha]	Developer
A	79	PT Kapuk Naga Indah
B	380	PT Kapuk Naga Indah
C	276	PT Kapuk Naga Indah
D	312	PT Kapuk Naga Indah
E	284	PT Kapuk Naga Indah
F	190	PT Jakarta Propertindo
G	155	PT Muara Wisesa Samudra
H	63	PT Taman Harapan Indah
I	405	PT Jaladri Kartika Eka Pakci
J	316	PT Pembangunan Jaya Ancol
K	32	PT Pembangunan Jaya Ancol
L	447	PT Manggala Krida Yudha
M	587	PT Manggala Krida Yudha
N	411	PT Pelindo II
O	344	PT Jakarta Propertindo
P	483	PT Kawasan Ekonomi Khusus Marunda
Q	369	PT Kawasan Ekonomi Khusus Marunda

## II: Urban fix: flood infrastructure

- Most of involved developers are the same people from the circle of New Order crony who created the land subsidence (through the illegal conversion of green area in the city for commercial purposes)
- There are evolving interests of developers in the island reclamation
- Developers gain profit around 20 million IDR ( $\sim$  1200 Euro) per sqm of land reclamation
- Total area of land reclamation 5133 ha; total profit: 61.5 billion Euro
- The fix risk to perpetuate the crisis (adding burden to the soil/Earth, causing more subsidence)