



**Jakarta Research Council –
Indonesia**

Supported by



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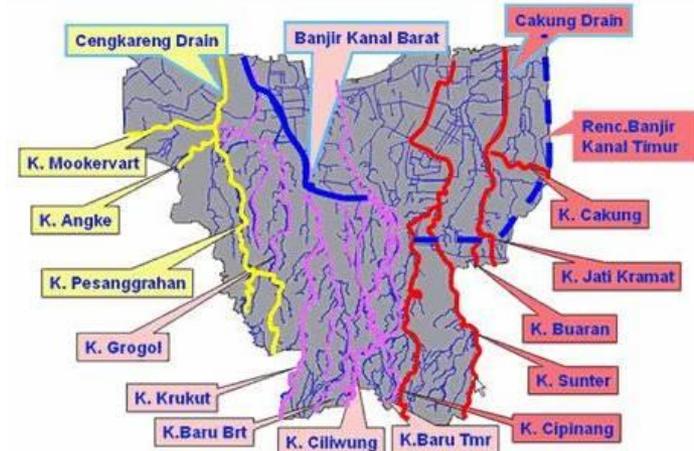
Hydrodynamic modelling for flood reduction
and climate resilient infrastructure
development pathways in Jakarta

**CTCN Advisory Board 10th meeting
Information Session
Copenhagen, 29-31 August 2017**

The Genesis of the CTCN intervention

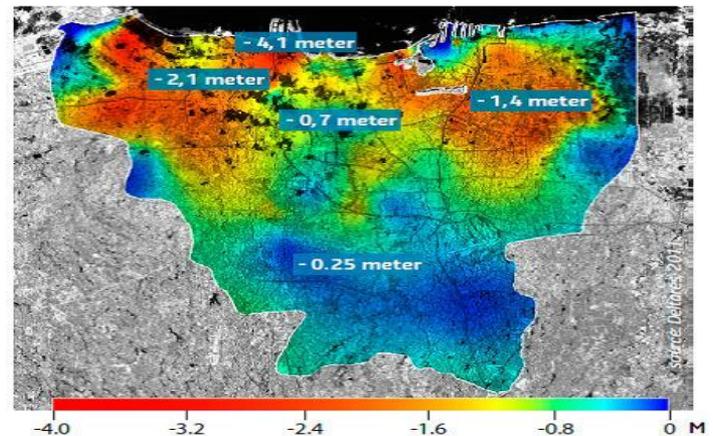
- Jakarta is threatened by flooding from combination of land subsidence, rising sea levels, higher river levels, spring tide cycle, etc.
- To face this challenge, CTCN was requested to assist (i) to better assess flood risks and hazards, and (ii) to design climate resilient pathways
- CTCN is capable to help in providing technology and knowledge to overcome flooding issue in Jakarta
- Jakarta Research Council is proponent as well as implementer of the CTCN project
- DHI Indonesia as the implementer network of CTCN in Indonesia

Jakarta is an estuary of 13 rivers



Source: Google

Land subsidence condition in Jakarta

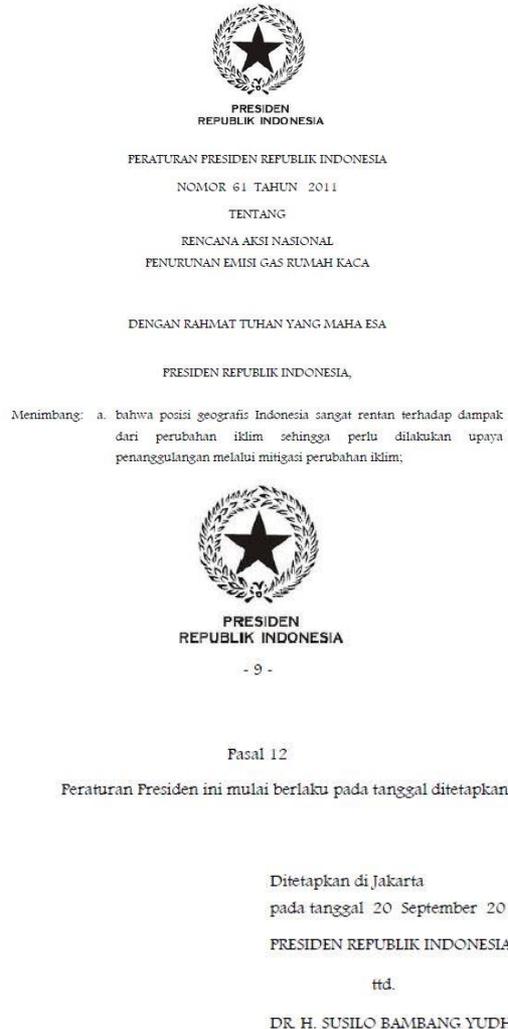


Land subsidence in Jakarta in period 1974-2010

Source: <http://www.ccop.or.th/>

The Genesis of the CTCN intervention

Cover of Presidential Decree 61/2011



Indonesia has high concern about climate change adaptation

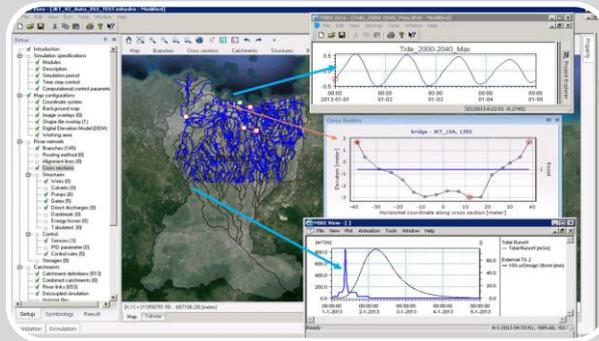


Manifested in Presidential Decree 61/2011 → National Action Plan for Green House Gases Emission Reduction



CTCN project can supports the implementation of national strategy in climate change adaptation and mitigation action particularly flooding issue

Main Activities of CTCN Project in Jakarta



Hydrodynamic modelling

- To develop a high resolution hydrodynamic model that is capable of producing flood levels under various climate and/or engineering scenarios



Sociocultural Risk Assessment

- To provide useful inputs regarding socioeconomic characteristics of the affected community into policy recommendation for flood risk reduction in Jakarta

The results of CTCN Project in Jakarta

Hydrodynamic modelling resulted, i.e.:

current flood model setup generates flood model consistent with increasing rainfall, tide and subsidence

Flood is caused more by increased rainfall rather than tide and projected sea level rise

Land subsidence significantly exacerbates flooding

Sociocultural risk assessment resulted, i.e.:

People are used to live with flood and their perception on flood risk is low

Most of households are resistant to the idea of relocation

Social resilience of the people is high

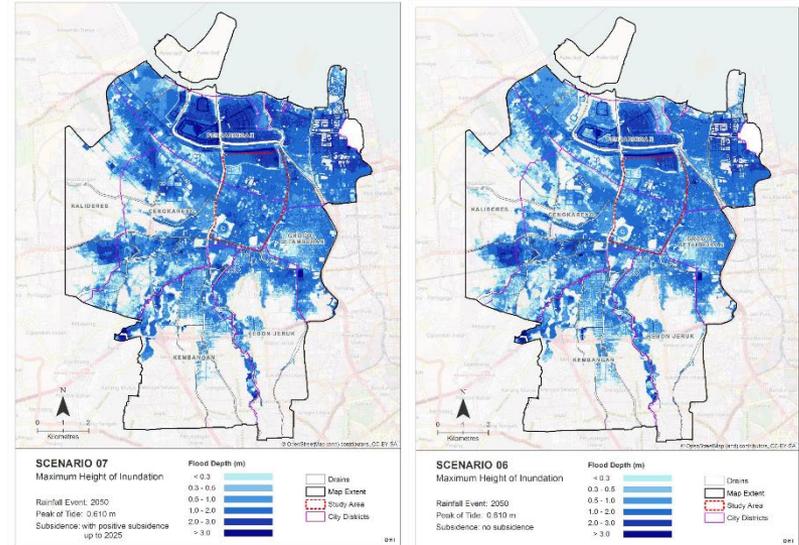


Table 6.1 Estimation of the retention pond capacity

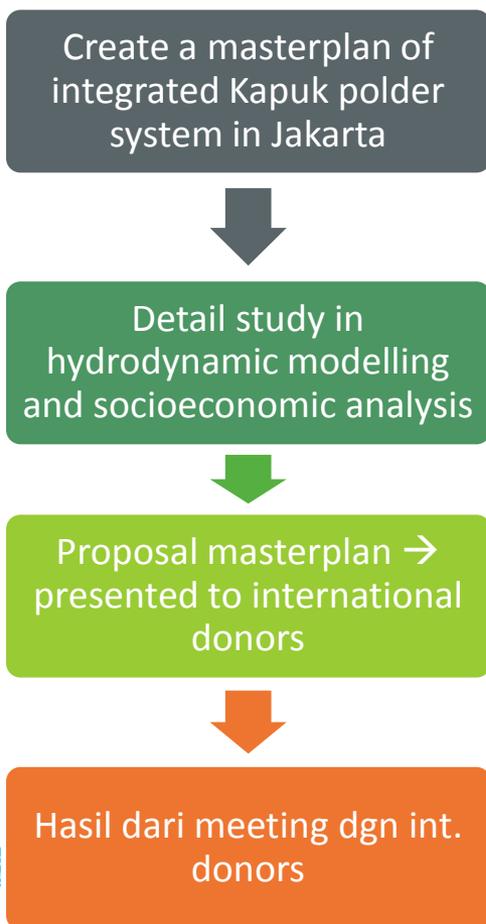
Year	Mean Flood Depth (m)	Pond Volume (m ³)	Depth in 200 ha Pond (m)
2007	0.84	7,463,854.30	3.73
2030	1.24	11,028,313.31	5.51

Table 6-2 Aggregate potential flood damage in each sub-district (Million USD)

Flood depth Outside house (Cm)	Potential damage (Million USD)			
	Kapuk	Kedaung Kali Angke	Kapuk Muara	Pejagalan
30	3.64	1.22	0.54	0.24
50	8.51	3.00	1.16	0.75
75	12.37	4.41	1.64	1.15
100	15.12	5.41	1.98	1.44
125	17.24	6.19	2.25	1.66
150	18.98	6.82	2.47	1.84
200	21.72	7.82	2.81	2.13

- A policy recommendation for Jakarta's government was resulted
- Head of Jakarta Regional Planning Agency asked to insert the policy recommendation resulted in this study into Jakarta's Mid-term Development Plan 2018-2022
- In Jakarta's Spatial Plan 2030, there will be developed 66 polder systems and 3 polder systems in this study are part of those 66 polder systems. The result of this study is expected to give more insights to the development of 66 polder systems
- In addition, the new elected governor of Jakarta has a concern on flood management. This policy recommendation is expected to support his concern towards flooding hazards in Jakarta
- During the project activities, collaboration between stakeholders have always been promoted. Therefore, a forum to unite the related stakeholders particularly Local Government Work Unit of Jakarta and the local communities is suggested in policy recommendation

Development of “Pre-Masterplan of Integrated Kapuk Polders Management System toward Adaptive and Climate Resilient Jakarta”






Hydrodynamic modelling

- Preliminary design
- Supported study:
 - Flood modelling
 - Sedimentation modelling
 - Water quality modelling
 - Groundwater modelling



Socioeconomic analysis

- Macro analysis
 - CBA
- Micro analysis
 - Land status and ownership analysis
 - Asset assessment of existing industries and households
 - Estimation of the willingness to accept for land acquisition compensation
 - Livelihood preference study

Concluding remarks

Received new knowledge in hydrological modelling with high resolution

Socioeconomic approach in this study gave insights and recommendation for Jakarta provincial government to implement the results

This study can be an example for development of other 66 polder systems in Jakarta and other provinces/regions in Indonesia

Notes about technology transfer in Jakarta : technology transfer couldn't be given directly to Local Government Work Unit since their main tasks are public services → there must be an intermediary who has technology competence



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www.ctc-n.org

ctcn@unep.org

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