OPTIMAL CLIMATE ADAPTATION POLICIES UNDER UNCERTAINTY AND IRREVERSIBILITY FOR REDUCING THE RISK OF FLOODING

Pini Wijayanti
Prof. Dr. Ekko v. Ierland
Prof. Dr. Akhmad Fauzi
Prof. Dr. Petra Hellegers, Dr. Xueqin Zhu
OUTLINE

- Problem Definition
- Research Objectives
- Research Questions
- Methodological Design
- Schedule
PROBLEM DEFINITION

- Big economic losses from floods in Jakarta
- Flooding occurs due to the natural and human activities
  - High Precipitation, Sea level Rise
  - Population, Ground Water Extraction, Land Subsidence
- Adaptations have been done by Private and Public (Government)
PROBLEM DEFINITION (CONT)

- Jakarta Government has a future plan for reducing floods, and it spends a huge budget.
- Investment in Flood control programs face uncertainty and irreversibility.
- There is limited information about the best policy from an economic perspective.
- Uncertainties and irreversibilities affect the best timing to adapt with future climate change.
- Development planning in Northern part of Jakarta.
RESEARCH OBJECTIVES

1. To study how water systems can be efficiently adapted to future climate change for reducing the risk of flooding in Jakarta.

2. To advance the economic theory to deal with this problem.
RESEARCH QUESTIONS

1. What is the value of economic losses due to climate changes in Jakarta in 30-40 years ahead?

2. What are the most prioritized policies in Jakarta from stakeholder perspective?

3. Based on general assessment of adaptation options, what should be the priorities? (upstream, middlestream, or downstream)

4. What are the cost and benefit of alternative adaptations in the presence of uncertainty, and what is the most efficient adaptation?
What is the value of economic losses due to climate changes in Jakarta in 30-40 years ahead?

- Assessment of direct and indirect economic losses combined with geographical information analysis of population and asset exposure

What are the most prioritized policies in Jakarta from stakeholder perspective?

- Multi-Criteria Analysis (MCA)
- Workshop with stakeholders
METHODOLOGICAL DESIGN (CONT)

RQ-3 Based on general assessment of adaptation options, what should be the priorities?

- Modelling approach

RQ-4 What are the cost and benefit of alternative adaptations in the presence of uncertainty, and what is the most effective adaptation?

- Advanced Cost Benefit Analysis (CBA) under uncertainty
- Cost Effectiveness Analysis (CEA)
## SCHEDULE

<table>
<thead>
<tr>
<th>Objectives</th>
<th>2012</th>
<th>2013</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>valuing of economic losses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>prioritized policies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General inventory assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the most effective adaptation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Thank You