DEMYSTIFYING PRIVATE ADAPTATION FINANCE*

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Adaptation as Exogenous Structural Change

Adaptation related activities:

as any activity which a private actor pursues which is performed differently compared to a counterfactual world without climate change
Relevant Economic Actors

Governments

Public Finance Institutions

Enterprises
e.g. SMEs, Corporates, Infrastructure

Private Financiers
Climate Adaptation Finance – towards an Actor Based Perspective

**ADAPTATION ACTIVITY**
- Risk
  - Operational
  - Construction
  - Technology
  - Regulatory

**Supply of Finance**
- Enterprises
  - e.g. SMEs, Corporates, Infrastructure
  - Increasing Resilience
  - Adaptation Business Opportunity

**Demand for Finance**
- Private Financiers
  - Different preferences
  - e.g. private individuals, banks, pension funds, venture capital funds, etc.
Topics addressed in the study

- How are private actors affected?
  - Adaptation measures → financing demand
  - Financing supply
- What keeps finance from flowing? (barriers)
- How can the barriers be overcome? (corrective policy instruments)

(Based on 28 case studies.)
Climate Impacts

- Water scarcity and drought
- Extreme heat events (including heat stress in urban areas)
- Increased flooding (including coastal flooding)
- Health-related climate risks
## Adaptation-related Activities: Cases

<table>
<thead>
<tr>
<th>Activity Type</th>
<th>Water scarcity and drought</th>
<th>Increased flooding</th>
<th>Extreme heat events</th>
<th>Health-related risks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SME/Corporate</strong></td>
<td></td>
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<tr>
<td>Upstream Supply Chain</td>
<td>Pest resistant crops</td>
<td>Index insurance</td>
<td>Planting shady trees</td>
<td>Medical equipment</td>
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<tr>
<td>Internal Processes (incl. employees)</td>
<td>Water efficient technologies</td>
<td>Seed banks</td>
<td>Energy efficient equipment</td>
<td>Manufacturing health products</td>
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<tr>
<td>Downstream market</td>
<td>Agriculture inputs</td>
<td>Early warning technologies</td>
<td>Landscape and urban design</td>
<td>Medical information</td>
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<tr>
<td><strong>Infrastructure</strong></td>
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<tr>
<td>Public infrastructure</td>
<td>Terracing</td>
<td>Coastal development</td>
<td>Spatial planning</td>
<td>Research facilities</td>
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<tr>
<td>Private infrastructure</td>
<td>Rainwater harvesting</td>
<td>Flood defence barrier</td>
<td>Green roofs</td>
<td>Mobile clinics</td>
</tr>
</tbody>
</table>

- **Activity Type:** SME/Corporate, Internal Processes (incl. employees), Downstream market, Infrastructure
- **Water scarcity and drought:** Pest resistant crops, Water efficient technologies, Agriculture inputs
- **Increased flooding:** Index insurance, Seed banks, Early warning technologies
- **Extreme heat events:** Planting shady trees, Energy efficient equipment, Landscape and urban design
- **Health-related risks:** Medical equipment, Manufacturing health products, Medical information

Additional activities include:
- Water efficient technologies
- Seed banks
- Energy efficient equipment
- Manufacturing health products
- Medical equipment
- Medical information
- Research facilities
- Mobile clinics
Adaptation related activities are financed using standard financing instruments.
A specific view on barriers

A lot of comprehensive work on barriers

e.g. CPI 2015; Vivid Economics 2015; Islam et al 2014; Barnett 2015; Jones 2010; PCIR 2012; Stenek 2013

Our working definition: Barriers to (adaptation-related) investments

“A friction that prevents socially optimal (adaptation-related) investments from materialising.”
# Mapping barriers to the investor perspective

<table>
<thead>
<tr>
<th>Economic</th>
<th>Externality</th>
<th>Imperfect capital market</th>
<th>Asymmetric information</th>
<th>Other market imperfections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investor</td>
<td>Public good provision</td>
<td>Technology externality</td>
<td></td>
<td></td>
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<tr>
<td>Reduced return</td>
<td>X</td>
<td></td>
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<tr>
<td>Risk / return</td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Output risk</td>
<td>X</td>
<td></td>
<td>X</td>
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<tr>
<td>Input factors risk</td>
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<tr>
<td>Labour force (input factor)</td>
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<tr>
<td>Liquidity risk</td>
<td></td>
<td>X</td>
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<tr>
<td>Regulatory &amp; policy risk</td>
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</table>
Illustrating the use of the mapping: Example – Lack of a market (price) for water

- Assume a country where demand for water exceeds supply for water due to bad water pipes

  No market price for water $\rightarrow$ market imperfection

**Option 1**
- Introduce a market price for water
  $\rightarrow$ Investment in water infrastructure will be more attractive

**Option 2**
- Keep ‘subsidised’ low water price
  $\rightarrow$ Investment in water infrastructure can be made more attractive (e.g. through concessional finance)
Information asymmetry

No climate data available → reduced demand & supply of adaptation related activities

Corrective policy instrument: Technical assistance grants for data collection, research or capacity building

SME / corporate
Technical assistance was provided as grant support for climate risk data collection and implement low-cost, no-regret adaptation measures

Infrastructure
IFC financed a feasibility study on climate risks to a port, creating demand for investment in resilience
Public good provision (externality) of adaptation activity

Maximisation of the own utility has a positive impact (externality) on the utility on another actor

Corrective policy instrument: Internalising the positive externality through incentivising the corresponding positive externality; subsidise efficient technologies

SME / corporate

Urban heat island effect: increased use of green roofs in cities has positive effects on others

Note: Negative externalities are also possible.
Imperfect capital market: Lack of liquidity in long-term debt market

Adaptation activities may face substantial payback periods \(\rightarrow\) lack of a liquid market for long term debt (supply of finance)

Corrective policy instrument: DFIs directly providing long-term debt; on-lending, in combination with senior debt to improve security for senior lender.

Infrastructure

\(\rightarrow\) A flood prevention barrier built around a private Industrial Estate: Government supplied a 15 year concessional loan
Imperfect capital market (insurance)

High (perceived) risks → Limited credit availability for new innovation/R&D
→ Limited insurance availability

Corrective policy instrument:
(i) Risk management tool that shares in credit risk; debt facility targeting innovation at different levels of development (e.g. targeting the classical SME financing gap).
(ii) providing guarantees; subsidising commercial (climate) risk insurance

SME / corporate
→ SMEs facing financing problems (mixture of capital market imperfections)
→ Not all climate risks are insurable. For some public institutions might provide insurance
Summary

- Adaptation is one example of exogenously imposed structural change.
- Financing adaptation-related activities is typically done using standard financing instruments.
- Public money for adaptation should be used to moderate and facilitate the structural change by tackling the barriers for financing supply and demand that stem from the market imperfections.