Property Developers’ Engagement in Adapting Urban Waterfronts to the Changing Climate

In Gothenburg and Dordrecht

by Caroline Nilsson
Overview

- Introduction
- Theoretical framework
- Research Approach
- Case studies
- Case study comparison
- Conclusion
Introduction
Background

Urbanization

Climate changes
Sweden and the Netherlands

Frihamnen

Stadswerven
Problem statement

Gothenburg and Dordrecht are developing adaptation strategies for the urban waterfronts.
Problem statement

Gothenburg and Dordrecht are developing adaptation strategies for the urban waterfronts. However in how far and why the property developers are involved in the adaptation process is unclear.
Research goal

The aim is to investigate the level of engagement of the property developers.
Research goal

The aim is to investigate the level of engagement of the property developers in the adaptation of the urban waterfronts.
Research goal

The aim is to investigate the level of engagement of the property developers in the adaptation of the urban waterfronts and what influences their engagement.
Theoretical framework
Willingness and ability to adapt

Receptivity theory:

- **Awareness** of the risks of the changing climate and the adaptation strategies.

Willingness and ability to adapt

Receptivity theory:

- **Awareness** of the risks of the changing climate and the adaptation strategies.

- **Association** of adapting the land and the buildings with benefits.

Willingness and ability to adapt

Receptivity theory:

- **Awareness** of the risks of the changing climate and the adaptation strategies.

- **Association** of adapting the land and the buildings with benefits.

- **Acquisition** of adaptation measures in the developments of the property developers.

Willingness and ability to adapt

Receptivity theory:

• **Awareness** of the risks of the changing climate and the adaptation strategies.

• **Association** of adapting the land and the buildings with benefits.

• **Acquisition** of adaptation measures in the developments of the property developers.

• **Application** of adaptation measures in the developments of the property developers.

Influences on behavior
Influences on behavior

Planning institutions

Institutions conditions
Influences on behavior

Economic conditions

Planning institutions

Institutions conditions

Theoretical framework
Influences on behavior

Economic conditions

Planning institutions

Institutions conditions

Physical conditions

Theoretical framework
Influences on behavior

Theoretical framework

Property developers' engagement in adapting urban waterfronts to the changing climate

Waterfront

Urbanization  Climate changes

Property developers
- Awareness
- Association
- Acquisition
- Application

Adapted waterfront

INTERNAL

EXTERNAL

DIRECT
- Planning institution

INDIRECT
- Economic conditions
- Institutional conditions
- Social conditions
- Physical conditions

Planning institution

Economic conditions

Institutional conditions

Social conditions

Physical conditions

Awareness

Association

Application
Research approach
Research questions

What influences the engagement of property developers in adapting urban waterfronts to the changing climate in Sweden and the Netherlands?
Research sub-questions

1. What features influences the behavior of property developers in adapting urban waterfronts to the changing climate?

2. To what extent are the property developers engaged in the adaptation of Frihamnen, Gothenburg and Stadswerven, Dordrecht?

3. What external features are dominant in influencing the property developer’s engagement in adapting the urban waterfronts in Gothenburg and Dordrecht?

4. Are the property developers differently engaged in the adaption of the waterfronts in Gothenburg and Dordrecht and what are the reasons here for?
Research design

Case study 1: Frihamnen

Case study 2: Stadswerven

Comparison
Research methodology

- Document analysis
- Semi-structured interviews
- Questionnaires
Research methodology

20 semi-structured interviews, whereof 13 in Gothenburg and 7 in Dordrecht.

Interview in Gothenburg

Interview in Dordrecht

Property developers’ engagement in adapting urban waterfronts to the changing climate
Research methodology

Analyzing of interviews:

Category: Engagement of property developers:

Category: Influences on behavior:
## Research methodology

### Analyzing of interviews:

#### Category: Engagement of property developers:
- Awareness
- Association
- Acquisition
- Application

#### Category: Influences on behavior:
- Planning institutions
- Economic conditions
- Institutional conditions
- Social conditions
- Physical conditions

<table>
<thead>
<tr>
<th>Engagement</th>
<th>Awareness</th>
<th>Association</th>
<th>Acquisition</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property developers' engagement in adapting urban waterfronts to the changing climate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Influences on behavior</th>
<th>Planning institutions</th>
<th>Economic conditions</th>
<th>Institutional conditions</th>
<th>Social conditions</th>
<th>Physical conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influence of awareness on behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence of association on behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence of acquisition on behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence of application on behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Research methodology

45 questionnaires, whereof 32 in Gothenburg and 13 in Dordrecht.
Case studies
Situation in Gothenburg and Frihamnen

Current situation (2008)  
Situation with 1 meter sea level rise and an extreme tide

Source: Cityplanner, Göteborg stad
Sweden | Frihamnen

Transformation of Frihamnen: First phase

Urban planners | Property developers

Consortium

Adaptation strategies

+ 2.0 m
+ 2.5 m

Ground level

1 000 apartments
Sweden | Frihamnen

Planned adaptation strategies

Higher parts: for rising sea levels.

Lower parts: for collection of rain water and transport to canal.
Sweden | Frihamnen

Engagement of property developers:

- They are **aware** of the flood risks and the adaptation strategies.

- They **associate** the adaptation of the waterfronts with benefits. However more focus on adaptation of the land than on the buildings.

- They are willing to **acquire** the adaptation measures to the land and the buildings.

- They are willing to **apply / implement** the adaptation measures to the land and the buildings.
Influences on the behavior of the property developers:

- **Planning institutions**: Partnership agreement with urban planners Älvstrandens developments. Property developers involved in the adaptation strategies.

- **Institutional conditions**: No focus on adaptation strategies, however are demanding more houses.

- **Economic conditions**: High housing demand and prices: Attractive for property developers to build and invest in adaptation measures.

- **Social conditions**: High housing demand: However not for adapted buildings.

- **Physical conditions**: Attractive location: near water and city center. Ground level to low: has to be raised and buildings adapted.
The Netherlands | Stadswerven

Situation in Dordrecht and Stadswerven

Normal situation

Situation with a (85 cm) tide

Source: Masterplan Stadswerven
The Netherlands | Stadswerven

Transformation of Stadswerven

750 dwellings and apartments

Ground level

+ 2.5 m
+ 3.5 m

Adaptation strategies

Urban planners

Property developers

3

Consortium
The Netherlands | Stadswerven

**Planned adaptation strategies**

*Higher parts:* for the tide and rising sea levels.

*Lower parts:* give place for water and citizens awareness.
Engagement of property developers:

- They are **aware** of the flood risks and the adaptation strategies.

- However they do not **associate** the adaptation of the buildings with any benefits. Focus on adaptation of land, done by the municipality.

- They do not **acquire** any adaptation measures to the land and the buildings. Choose to not develop the low-lying buildings.

- They do not **apply / implement** any adaptation measures to the land and the buildings.
The Netherlands | Stadswerven

Influences on the behavior of the property developers:

- **Planning institutions**: Partnership agreement with urban planners Municipality Dordrecht. Property developers have much influences on the adaptation and master plan.

- **Institutional conditions**: National and regional government not responsible for flood protection. Municipality, property developers and homeowners are.

- **Economic conditions**: Economic crisis in 2008/2009: housing prices dropped and master plan for Stadswerven had to be adjusted.

- **Social conditions**: Low housing demand: Housing prices have a limit: property developers do not want to invest in expensive adaptation measures.

- **Physical conditions**: Attractive area: near water and city center. However Dordrecht is not Amsterdam. Ground raised.
Case study comparison
Influences on engagement property developers

Business model | Cash flow

<table>
<thead>
<tr>
<th></th>
<th>Long term</th>
<th>Short term</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sales property</td>
<td>Acquisition property</td>
</tr>
<tr>
<td>Flood damages</td>
<td>Construction costs</td>
<td>Acquisition ground</td>
</tr>
<tr>
<td>Rents</td>
<td>Construction costs</td>
<td>Flood damages</td>
</tr>
<tr>
<td>Acquisition ground</td>
<td>Construction costs</td>
<td>Flood damages</td>
</tr>
<tr>
<td>Construction costs</td>
<td>Construction costs</td>
<td>Acquisition ground</td>
</tr>
<tr>
<td>Flood damages</td>
<td>Construction costs</td>
<td>Acquisition ground</td>
</tr>
</tbody>
</table>

DORDRECHT

GOTHENBURG

GOTHENBURG
Engagement of property developers

Partnership agreement | Consortiums

GOTHENBURG

DORDRECHT
Engagement of property developers

Economic conditions | Housing demand

High housing demand

Housing prices going up

Low housing demand

Housing prices going down

GOTHENBURG  DORDRECHT
Engagement of property developers

Economic conditions | Location

GOTHENBURG | DORDRECHT
Influences on the behavior

- Location
- Economy
- Master and zoning plan
- Housing demand
- National and regional governments
- Consortium (Urban planners, Property developers)
- Cash flow
- Time

Property developers’ engagement in adapting urban waterfronts to the changing climate
Conclusion
Research question

What influences the engagement of property developers in adapting urban waterfronts to the changing climate in Sweden and the Netherlands?
Connections

Property developers’ engagement in adapting urban waterfronts to the changing climate
Property developers’ engagement in adapting urban waterfronts to the changing climate
Property developers’ engagement in adapting urban waterfronts to the changing climate

Connections

- Public flood risk awareness
- Economic conditions
- Location
- Housing demand
- National and regional governments
- Business model
- Cash flow
- Master and zoning plan
- Partnership agreement

Adapted waterfront

Conclusion
Connections

Property developers' engagement in adapting urban waterfronts to the changing climate
Connections

Property developers' engagement in adapting urban waterfronts to the changing climate

- Public flood risk awareness
- Economic conditions
- Location
- Housing demand
- Business model
- Cash flow
- Adapted waterfront
- Partnership agreement
- Urban planners from the municipality
- Property developers
- Master and zoning plan
- National and regional governments
- Banks
- Insurance
- National and regional governments
- Economic conditions
- Location
- Housing demand
- Partnership agreement
- Urban planners from the municipality
- Property developers
- Master and zoning plan
- National and regional governments
- Banks
- Insurance
Property developers’ engagement in adapting urban waterfronts to the changing climate

Connections

Public flood risk awareness
Banks
Economic conditions
Location
Housing demand
Property developers
Adapted waterfront
National and regional governments
Master and zoning plan
Insurance

Business model
Cash flow

Partnership agreement
Consortium
Urban planners from the municipality
Property developers

Time

Conclusion
Recommendations

- **Select long term property developers**: business model.
- **Urban planners needs to have influence**: partnership agreement.
- **Flexible and adjustable adaptation strategies**: uncertainness with the changing climate and housing demand.
- **Divide project into several phases / land allocations**: more control on developments and creates incentives for the property developers to do their best.
- **Collaborate with insurance companies**: to ensure that the insurance conditions aren’t suddenly changed.
- **Increase public flood risk awareness**: demand for adapted houses and willingness to pay for this and an increased water tariff to protect areas from flooding.
Recommendations

• **Select long term property developers:** business model.

• **Urban planners needs to have influence:** partnership agreement.
Recommendations

• **Select long term property developers:** business model.

• **Urban planners needs to have influence:** partnership agreement.

• **Flexible and adjustable adaptation strategies:** uncertainty with the changing climate and housing demand.
Recommendations

- **Select long term property developers**: business model.

- **Urban planners needs to have influence**: partnership agreement.

- **Flexible and adjustable adaptation strategies**: uncertainty with the changing climate and housing demand.

- **Divide project into several phases / land allocations**: more control on developments and creates incentives for the property developers to do their best.
Recommendations

• **Select long term property developers**: business model.

• **Urban planners needs to have influence**: partnership agreement.

• **Flexible and adjustable adaptation strategies**: uncertainness with the changing climate and housing demand.

• **Divide project into several phases / land allocations**: more control on developments and creates incentives for the property developers to do their best.

• **Collaborate with insurance companies**: to ensure that the insurance conditions aren’t suddenly changed.
Recommendations

• **Select long term property developers:** business model.

• **Urban planners needs to have influence:** partnership agreement.

• **Flexible and adjustable adaptation strategies:** uncertainty with the changing climate and housing demand.

• **Divide project into several phases / land allocations:** more control on developments and creates incentives for the property developers to do their best.

• **Collaborate with insurance companies:** to ensure that the insurance conditions aren’t suddenly changed.

• **Increase public flood risk awareness:** demand for adapted houses and willingness to pay for this and an increased water tariff to protect areas from flooding.