Industry and Housing: Clash or Match?

A qualitative study into residents’ experience of living close to industry and how this affects their perception of nuisance and satisfaction.
PORT CITIES

Port and city different ideas about how space around waterfronts should be planned.

- Urban planning of Port Cities: A slow, costly and sometimes conflictual process
PORT CITIES

Mixed-use as outcome:
• A collaborative way of urban planning
• Space designed for all users

Literature study:
• Mixed-Use concept
• Focus on industry and housing
MIXED-USE

city functions
small scale
vertical and horizontal mix
fine urban structure

↔

city and industrial functions
large scale
horizontal mixed
gross urban structure
FINE GRAINED MIXED-USE

Literature study shows:
• Commonly used in practice
• Much focus on benefits
• Limited focus on drawbacks
FINE GRAINED MIXED-USE

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- Commonly used in practice
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FINE GRAINED MIXED-USE

Development time overruns
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FINE GRAINED MIXED-USE

Literature study shows:
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- Sustainability
- Synergy
- Liveliness
- Development time overruns
- Development cost overruns
- Low residential satisfaction
GROSS GRAINED MIXED-USE

**Literature study shows:**

- Typically avoided in practice
- **Much focus** on **drawbacks**
- **Limited focus** on **benefits**
- Mix industry and housing usually doesn’t last long

**Synergy**

**Safety-and-health risks**

**Legal complexity**

**Spatial mismatch**

**Knowledge exchange**

**Innovation**
GROSS GRAINED MIXED-USE

**Literature study shows:**
- Typically avoided in practice
- Much focus on potential drawbacks
- Limited focus on benefits
- **Mix industry and housing usually doesn’t last long**
RESIDENTIAL NUISANCE

low residential satisfaction

mix industry housing doesn’t last long

Managing residential nuisance is key!
RESIDENTIAL NUISANCE

Objective approach:
- **Calculation** environmental load
- Compliance environmental **norms**
- At-source **interventions**
- Protective **measures**

Nuisance source

<table>
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<th>Nuisance source</th>
<th>Nuisance receiver</th>
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Conclusion
RESIDENTIAL NUISANCE

Objective approach:
- Calculation environmental load
- Compliance environmental norms
- At-source interventions
- Protective measures

Critique on approach:
- Receiver’s experience underexposed
- Annoyance and health risks overlooked
RESIDENTIAL NUISANCE

Actual nuisance: **objective** level of nuisance actually **exposed** to the receiver

Perceived nuisance: **subjective** level of nuisance **perceived** by the receiver
RESIDENTIAL NUISANCE

**Actual nuisance:** objective level of nuisance actually exposed to the receiver

**Perceived nuisance:** subjective level of nuisance perceived by the receiver
**Conceptual Model**

**Introduction**

**Literature Study**

**Conceptual Model**

**Research Questions**

**Research Method**

**Data Collection**

**Research Findings**

**Conclusion**

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**Perceived Nuisance Factors**

- **Demographic & socio-economic**
  e.g. education level
- **Personal**
  e.g. nuisance tolerance
- **Social**
  e.g. image source
- **Situational**
  e.g. presence park

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**Actual Nuisance**

- Decibels
- Distance Industry
- Visibility industry

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**Perceived Nuisance**

- Surveys
- Complaint record
- Protests
- NIMBY-behaviour

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**Residential Satisfaction**

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*Strong relation*

*Weaker relation*

*Concepts paid most attention to in this research*
Main Research Question:

“How do residents, living in an area close to industry, experience their living environment regarding industrial nuisance,

what personal and situational factors could influence their perceived nuisance caused by industry,

and, what does this mean for the urban planning context?”
CASE: HOEK VAN HOLLAND

Hoek van Holland:
- At the end of De Nieuwe Waterweg
- Part municipality of Rotterdam
- 10,000 inhabitants, 14 km²
- Wide sandy beach
- Residential area close to industry
CASE: HOEK VAN HOLLAND

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Stenaline (international shipping transport)

Tweede Maasvlakte

Sandy beach

Renewi (waste composting)

greenhousing
RESEARCH DESIGN

Qualitative Study Methods:
- 2 focus groups with residents in Hoek van Holland
- 1 in-depth interview urban planner Rotterdam
- continuous desk-top research
- Validation and complementation
INDIVIDUAL AND COLLECTIVE

Individual exercises as springboard for collective discussion
WRITTEN, VERBAL AND VISUAL DATA
FINDING PARTICIPANTS

- Posting flyers
- Social media
- 2000 flyers
- Local newspapers
- Smart deals
- Ringing doors

Introduction

Literature Study

Conceptual Model

Research Questions

Research Method

Data Collection

Research Findings

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NOT PUBLISHED DUE TO PRIVACY

Hoe ervaren jullie het om in een industriële omgeving te wonen?
In Hoek van Holland is er ruimte voor wonen, recreatie en werk. Industriële bedrijvigheid is hier een belangrijk onderdeel van en ik ben heel benieuwd hoe jullie dit als bewoner ervaren.

Aan de hand van foto's, stellingen, teksten en zorgen, tevreden of zeker niet vereist) zullen we met elkaar in gesprek gaan. We proberen over wonen dicht bij industrie en over mogelijkheden tot ontspanning in de omgeving, zo stellen we bijvoorbeeld vast op welke plaatsen industriële overlast ervaren wordt en welke plekken in Hoek van Holland fijn zijn om te wandelen, picknicken, sporten etc.

Wie zijn welkom? De discussiegroep zal bestaan uit ongeveer 5 bewoners. Iedereen die ouder is dan 18 jaar en die langer dan 6 maanden in Hoek van Holland woont is welkom. Helpus kan per huiskindhoven maar 1 iemand zich opgeven.

Wanneer? De discussiegroep zal ongeveer 2 uur duren en er zijn vier avonden waarvoor u zich kan opgeven: dinsdag 3, woensdag 4, woensdag 11, donderdag 12 maart

Interesse? Stuur voor 24 februari 2020 een e-mail naar K.vandenBorgert@student.tudelft.nl

Als iemand het leuk lijkt door discussiegroep bij hem of haar thuis te organiseren zodat ik dat zo op prijs. Vanzelfsprekend zorg ik dan voor een hapje en een drankje.

Waarom meedoen?
- Denk mee over de combinatie van wonen en industrie in stedelijke planning
- Maak op een relaxte, maar actieve manier kennis met andere bewoners
- Bonnehapjes en pizza!
TYPES OF NUISANCE IN HOEK VAN HOLLAND

Vibrations  
View  
Noise

View  
Noise  
Orange-colored soot  
Black-colored soot

Light pollution

Smell

Traffic  
Holiday homes  
Neighbours  
Modern architecture
DISTANCE IS NOT ALWAYS EFFECTIVE ENOUGH
ACTUAL NUISANCE IS NOT PERCEIVED NUISANCE

Level of annoyance regarding black-colored does not depend on observation alone

Very annoyed  Very annoyed  Little annoyed  Little annoyed  Little annoyed
# Perceived Nuisance Factors

## Introduction

### Literature Study

### Conceptual Model

### Research Questions

### Research Method

### Data Collection

### Research Findings

### Conclusion

## Conceptual Model

![Conceptual Model Diagram]

## Table: Perceived Nuisance Factors

<table>
<thead>
<tr>
<th>Actual Nuisance Factors</th>
<th>Personal Factors</th>
<th>Situational Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observability nuisance in daily life</td>
<td>Habituation</td>
<td>Co-housing</td>
</tr>
<tr>
<td>Moment of time nuisance*</td>
<td>Feelings of familiarity, pride</td>
<td>Age friendly house</td>
</tr>
<tr>
<td>Duration nuisance</td>
<td>Intersubjectivity with living environment</td>
<td>A house that supports to do hobby’s</td>
</tr>
<tr>
<td>Permanence nuisance**</td>
<td>Experience past nuisance in current place of residence*</td>
<td>Hidden industry</td>
</tr>
<tr>
<td>Potential health risks nuisance</td>
<td>Previous place of residence*</td>
<td>Provided earplugs and eye masks industry</td>
</tr>
<tr>
<td>Potential safety risks</td>
<td>Places visited (during holidays)*</td>
<td>Holiday assurance</td>
</tr>
<tr>
<td>Operator of nuisance source*</td>
<td>Knowledge regarding nuisance source*</td>
<td>Parc-like, green natural environment</td>
</tr>
<tr>
<td>Esthetical quality nuisance source</td>
<td>Personal interest in nuisance source</td>
<td>No evaluation house</td>
</tr>
<tr>
<td>Controllability nuisance</td>
<td>Economic dependence on nuisance source</td>
<td>A holiday home in the woods</td>
</tr>
<tr>
<td>Predictability nuisance</td>
<td>The “busy bee” degree: Degree of enjoyment to do a lot of things and keep yourself busy</td>
<td>Optimal noise insulation</td>
</tr>
<tr>
<td>Presence of other types of nuisance*</td>
<td>Observant or intuitive personality: observant or Intuitive way of processing the environment*</td>
<td>Optimal energy insulation</td>
</tr>
<tr>
<td>Degree nuisance source offers entertainment</td>
<td>Personal sensitivity</td>
<td>Spatial house</td>
</tr>
<tr>
<td>Degree nuisance source supports economic growth</td>
<td>Presence (emotional) distraction*</td>
<td>Facilities and activities in the neighborhood</td>
</tr>
<tr>
<td>Trust government</td>
<td>Age friendly house</td>
<td></td>
</tr>
<tr>
<td>Previous experience government*</td>
<td>Greens areas nearby</td>
<td>Luxurious house</td>
</tr>
<tr>
<td>Personal expectations regarding nuisance in a particular place*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Coping Mechanisms*</td>
<td>Environmentally friendly house</td>
<td></td>
</tr>
<tr>
<td>General interest in living environment</td>
<td>Living environment supported by industry</td>
<td>Mediterranean public space</td>
</tr>
<tr>
<td>Personal criticalness regarding own living environment</td>
<td></td>
<td></td>
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* = weighted

** = moderate weighted
PERCEIVED NUISANCE FACTORS

Introduction

Literature Study

Conceptual Model

Research Questions

Research Method

Data Collection

Research Findings

Conclusion

ACTUAL NUISANCE FACTORS

Personnel sensitivity

Degree nuisance source supports economic growth

PERSONAL FACTORS

Actual nuisance factors

Situational factors

Situational factors

Situational factors
RESIDENTIAL SATISFACTION AND PERCEIVED NUISANCE

Weighing the **positive** and **negative** sides

**Satisfied** residents → Lower perceived nuisance

**Less satisfied** residents → Higher perceived nuisance
RESIDENTIAL SATISFACTION AND PERCEIVED NUISANCE

Weighing the positive and negative sides

Satisfied residents

Less satisfied residents

Lower perceived nuisance

Higher perceived nuisance
RESIDENTIAL SATISFACTION AND PERCEIVED NUISANCE

Residential satisfaction

Perceived nuisance
RESIDENTIAL SATISFACTION AND PERCEIVED NUISANCE

Residential satisfaction

Perceived nuisance

dualistic effect
NUISANCE AND URBAN PLANNING

Environmental agreements:

- Accepted growth (port/village)
- Location of noise contours
- Facade insulation measures
- Acceptation, customization, deviation of environmental norms
Area developments:

- Acceptation, customization, deviation of environmental agreements
Introduction

Monitoring environmental quality:

• Measuring
• Reporting
• participation

Literature Study

Conceptual Model

Research Questions

Research Method

Data Collection

Research Findings

NUISANCE AND URBAN PLANNING

ENVIRONMENTAL AGREEMENTS

AREA DEVELOPMENTS

MONITORING ENVIRONMENTAL QUALITY

Conclusion
NUISANCE AND URBAN PLANNING

Continuous conversation:

ENVIRONMENTAL AGREEMENTS

AREA DEVELOPMENTS

MONITORING ENVIRONMENTAL QUALITY

Research Findings

Gemeente Rotterdam

DCMR milieudienst Rijnmond

Port of Rotterdam
NUISANCE AND URBAN PLANNING

- ENVIRONMENTAL AGREEMENTS
- AREA DEVELOPMENTS
- MONITORING ENVIRONMENTAL QUALITY

Continuous balancing act:
- Villages vs. Port
- Environmental values vs. Socio-economic values
- Residents vs. Industries
CONCLUSION

• Industrial and non-industrial sources of nuisance

• When environmental norms are reached, residents could still experience feelings of annoyance

• Each person assesses its living environment in a different way

• Residential satisfaction and perceived nuisance

RECOMMENDATIONS

Consider and address...

- user incompatibility
- residential nuisance
- end-user experience
- feelings of compensation
- residential satisfaction

Act...

- in a holistic way
- with leadership
- in a creative way
CONCLUSION
Questions?