Post-disaster housing
The role of housing associations in the housing problem after a flood

Final research proposal

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Date: January the 10th, 2012
MSc Laboratory: Housing Policy, Management and Sustainability
## Final research proposal

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<th>Jermaine Michael Muller</th>
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| MSc Laboratory | Housing Policy, Management and Sustainability |

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Preface

This report consists the final research proposal, written on behalf of the graduation laboratory Housing Policy, Management and Sustainability at the Faculty of Architecture, Urbanism and Building Sciences of the Delft University of Technology. This final research proposal will describe why and how the role of housing associations in the housing problem after a flood should be more effective. This research proposal will be presented on Tuesday January the 17th 2012 at 01.west.640.

Gratitude will be shown towards drs. C. L. van der Flier and prof. dr. ir. V. Gruis and my main supervisor prof. dr. P. J. Boelhouwer for their assistance during the course AR3R10 Housing Policy, Management and Sustainability laboratory.

Rotterdam, January the 10th 2012

Jermaine Muller
Abstract

What will happen to evacuees in case of a flood? Most likely they will seek refuge at crisis center during the first 48 hours. But what actions will be taken if it takes weeks before they can move back to their residences? This research focuses on the role housing associations to the housing problem after a flood. Between local authorities and housing associations are currently no covenants regarding to post-disaster housing. The result of this research is to increase the role of housing associations, to respond effectively to the housing problem after a flood.

But in order to increase the role of housing associations, data will have to be collected at several stakeholders in order to form a theory that will be sufficient to compose a post-disaster housing instrument. This report elaborates on the research method to compose the post-disaster housing instrument.
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1 Research motives

1.1 Personal motivation
During the second semester of the academic year 2010-2011, I attended an exchange program in Singapore. During my stay two large natural disasters occurred in Japan and in New Zealand and while following all the news events during the aftermath, I got inspired to use disasters as a theme in my research subject. Before I went to Singapore, I was following the old master track Design and Construction Management and the starting point was to find a research subject about disasters within the DCM theme. After my exchange period in Singapore I have been travelling through Southeast Asia and Australia and was touched by the contrast between poverty and wealth in the Southeast Asian countries and even in a fully industrialized country as Australia. The confrontation with this phenomenon, motivated me to find a research subject that is focused on a more social level.

These two factors motivated and inspired me to conduct a research in the post-disaster field and combined with housing. My first intention was to conduct a research of three foreign disasters and compare it with the Dutch approach. But after searching for information about the Dutch response about post-disaster housing, there is only minimal information concerning response strategies to be found. Because of this phenomenon I adjusted my research about the foreign cases into a Dutch case about the response after a disaster. To still be strongly connected to the Faculty of Architecture and especially to the graduation laboratory of Housing Policy, Management and Sustainability, the role of the Dutch housing associations is incorporated in the research theme. How can they respond to the sudden housing demand if a disaster would occur in The Netherlands? To what extent can preparations be made? Or do the housing associations do not play a part at all?

1.2 Reader’s guide
This final research proposal will describe the research approach regarding to the research theme, “Post disaster housing: the role of housing associations in the housing problem after a flood.” Chapter 1 describes the relevance and the potential of the research theme. In the second chapter the problem will be analyzed and results in to a main research question. Chapter 3 elaborates on the research method, and the method of approach of the detailed research questions. In chapter 4 indicates the table of content of the final report. The last chapter will describe how the research will be planned between the P2 and the P4-examn.
2 Theoretical framework

2.1 Scientific relevance
To emphasize the scientific relevance of this research an explanation of the draft research proposal is required in order to understand the development of the scientific relevance of the research theme.

At the end of the first quarter, the P1 draft proposal that was submitted contains a research theme that was aimed on the response of housing associations to a flood. As there were misinterpretations of the aim of the research theme, that the research is focused on the organization and implementation of emergency plans within housing associations, it should be clearly stated that it is not the aim of this research.

Several housing associations were approached to inform if there are emergency response plans incorporated in the organization. Some of the housing associations responded that they have plans incorporated to respond on emergencies, these emergency response plans are based on threats that have a high probability to occur in the region where the housing stock is located.

The problem is not how housing associations should respond in case of an emergency, but the problem is on how to respond to the sudden housing demand after an emergency. In paragraph § 2.4 the analysis of the problem will be described more in detail.

The phenomenon of the demand and supply in dwellings is more related to the graduation laboratory Housing Policy, Management and Sustainability. What distinguishes this research theme from other themes and makes this an original research theme is that it is aimed on an underexposed and underrated phenomenon within the faculty namely, post-disaster housing.

The Netherlands is together with Japan and Chile extremely exposed to sea level rise and floods, this research might be very valuable when a flood or another disaster will occur in The Netherlands.

If the Dutch housing associations do not know how to respond to a large and in particular a sudden housing demand after a flood. Why would this research theme not be relevant and not interesting enough to research? It might sounds that this research does not add any value to science and in particularly to the domain of Real Estate and Housing. Scientific studies, journals and papers are discussing the increasing threat of floods. Experts in the field of civil engineering, meteorology and safety, acknowledge that the climate is changing and the chance of a flood is increasing.

If a flood will occur in The Netherland, how can housing associations respond on the housing problem? This seems a valid reason to conduct a research on post-disaster housing (Bundis Entwicklung Hilft, 2011).

2.2 Societal relevance
Mild winters, heavy rainfall and a Northwestern storm, a meteorological unfortunately concurrence of circumstances. This in combination with an already saturated soil leads to high water levels and flooded grasslands. A phenomenon that the villages of Woltersum, Wittewierum, Ten Boer and Ten Post near Groningen did not expect to happen on January the 6th 2012. Because of the high water level there was a risk that the dike would burst, in order of the mayor of Ten Boer 800 people were forced to evacuate their residences.
A day before the evacuation in Groningen, a dike was burst over a length of 200 meters near Grou. A number of 130 residents were evacuated and sought refuge in hotels. Due intensive effort of the dike boards and National Reserves, the situation was controllable on January the 7th 2012. The water level was descending, the water pressure was reducing and the 800 evacuees were finally aloud to return to their residences.

What would happen to the evacuees, if the dikes would burst? A dike burst would flood the area and the water level would rise to 1.5 meters. To control the water it would take weeks and not to mention the damage it will cause to the dwellings and to infrastructure. Refuging in crisis centers is a short-term solution, where will the evacuees go if it takes weeks to return to their residences?

![Figure 1 Collapsed road after the Wilnis dike burst (Gemeente De Ronde Venen, 2004)](image)

The societal potential of this research is to increase the role of the housing associations to the housing problem after a flood, or any other disaster type that results in to a sudden housing demand. Re-housing evacuees from crisis center to alternative housing is a responsibility that is appointed to the local authority, but the local authorities will need the assistance of housing associations. This research is aimed to increase the collaboration between the local authority and housing associations in case of sudden housing demands due to disasters.

### 2.3 Utilization potential

The utilization potential of the outcome of the research will indicate how the collaboration between housing associations and local authorities can be improved in the field of post-disaster housing. If the role of the housing associations is better defined within the emergency response plans of local authorities, both parties can respond more adequate to the housing problem after a flood.

The end result will not be directly applicable as it is a recommendation how both parties can improve their collaboration, it is up to Aedes and VNG to steer on the implementation.
2.4 Problem analysis

In the Netherlands we do have the expertise in the field of housing of large numbers of households. For example The Netherlands dealt with this phenomenon during the post-war era and recently with the housing problem with immigrant workers, asylum seekers and with the relocation of residents that are living in areas that are undergoing a redevelopment. But in the field of post-disaster housing there is minimal knowledge to obtain from Dutch disaster cases. The largest disaster in the history of The Netherlands where a large number of people needed to be evacuate and housed was the North Sea flood and dates from 1953.

At the end of the 20th century there were two prominent incidents that involved the evacuation of people. In 1992 there was the crash of El Al flight 1862, which crashed into an apartment building in a neighborhood that mainly consists of dwellings owned by housing associations. In 1995 there was a large evacuation in Rivierenland, a region in the province of Gelderland. This evacuation involved the 250,000 people that were forced to leave their original place of residence, because of an extremely high water level with the possibility of a dike burst. In the more recent disaster history there was the Enschede fireworks disaster (2000) and the Wilnis dike burst (2003).

In the cases of Wilnis and Enschede the population of the struck areas were evacuated and temporary housing was the solution for the loss of their original place of residence. With the help of local housing associations the victims were re-housed from the crisis center to alternative housing so the victims could continue their common domestic activities.

Acting upon instruction of the Dutch Ministry of Security and Justice, Taskforce Management Overstromingen (Taskforce Management Floods) composed a report with recommendations in case a flood will occur of the proportions of the North Sea flood of 1953. This report is completed with the additional report Nafase (post-phase) that elaborates on the composition an after-care strategy. This after-care strategy is aimed on the organization of post-disaster recovery, the reception of victims, temporary facilities, drainage of the flooded area and post-disaster reconstruction.

In the post-phase of the Enschede fireworks disaster, ad-hoc response of local housing associations made it possible that the victims were relocated from temporary housing to structural housing within a short period. In relation to the TMO report, the region of Twente is together with the region of Groningen interested in a research to act as a retreat in case of a disaster of national scale. This is an important step towards a national strategy for the post-phase in case of a flood.

But how is the awareness of such dramatic events on the local scale, are housing associations and local authorities prepared to respond to the housing problem in case of a flood? Are they aware of the role that housing associations can fulfill to the sudden housing demand? Is the national government aware of the Dutch housing model how it can be used as a measure in case of a housing demand after a flood?

The largest threat for The Netherlands regarding to natural disasters is the battle against water. What characterizes The Netherlands is that a large part of the country is located under sea level. Throughout the ages the Dutch responded by constructing dikes and reclaiming land that made them experts in the field of coastal and water engineering. Even though there is a large system consisting of engineering structures, dikes and dunes protecting The Netherlands for overflowing the country, there is still a possibility that the country will flow over because of environmental or human causes.
2.4.1 How large is the risk compared to other countries?

In 2011 the Bundnis Entwicklung Hilft published the World Risk Report, which describes the disaster risk for various countries and regions. The disaster risk is expressed in an index that is based on an indication in the following four components:

- **Exposure**
- **Susceptibility**
- **Coping capacities**
- **Adaptive capacities**

**Figure 2 Risk index components (Bundnis Entwicklung Hilft, 2011)**

**Figure 3 World Risk Index (Bundnis Entwicklung Hilft, 2011)**

The overall index is calculated by combining the four components. The vulnerability of a society (susceptibility, coping and adaption) will be combined with the exposure to natural hazards.
12. POST-DISASTER HOUSING: THE ROLE OF HOUSING ASSOCIATIONS IN THE HOUSING PROBLEM AFTER A FLOOD

The Netherlands is ranked as 12th most exposed country to natural disasters with an exposure rate of 29.24 percent. Due to a low vulnerability rate The Netherlands is ranked as 69th in the World Risk Index, even though it is still the highest ranked European country. Together with Switzerland and the Scandinavian countries, The Netherlands has a low coping and adaption rate in comparison to the other EU-27 countries.

Figure 4 Indices of the EU-27 plus Norway, Iceland and Switzerland (Bundnis Entwicklung Hilft, 2011)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
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2.4.2 Awareness of the risks of the Dutch government

The Dutch organization Rijkswaterstaat, which is part of the Ministry of Infrastructure and Environment, composed the report Veiligheid Nederland in Kaart with as purpose to gain insight on the probability and effects of floods in The Netherlands.

![Maximum water depths in case (Rijkswaterstaat, 2005)](image)

The figure above depicts the maximum water depths in The Netherlands, the white areas are the areas where the maximum water depth is 0.01 meter and the dark red areas are the areas with maximum water depth of 6.5 meter. All coastal provinces and regions along the main rivers will over flow if a flood of such large proportions will occur that the water level will rise to the NAP (Normaal Amsterdams Peil).

The Netherlands has been divided into so-called dike-rings, which are areas of land that are protected by an individual dike, dune or engineering structure. The economic effects of a flood varies per dike-ring, so is the maximum economic loss in Terschelling estimated on € 160 million, while the maximum economic loss in Zuid-Holland is estimated on € 300 billion (Rijkswaterstaat, 2005).
As much as the maximum economic loss varies does the probability vary as well. Each dike-ring has been assigned a safety norm that is determined by the population density and the economic value of the area. For example the probability of a flood in the coastal areas estimated at 1/4000 and the Randstad is estimated at 1/10,000. It will be interesting to research how the housing associations in an area with a probability of 1/1250 for example the region of Groot Salland is prepared if a flood will occur with a housing association in an area with a probability of 1/4000 like the province of Zeeland (Rijkswaterstaat, 2005).
2.4.3 What types of floods are threats to The Netherlands?
A flood occurs when an uncontrollable amount of water flows into the land, the cause can be a failure of an engineering structure, meteorological cause. A flood is a realistic threat to The Netherlands as:

• Large parts are located below sea level and protected by dunes, dikes and wave breakers, this is known as a sea flood
• The climate is changing, the sea level is rising and rain showers are more frequent and more intense and the current drainage system is incapable to process peak discharges, this is known as an urban flood
• There are large rivers in The Netherlands such as the Rhine and the Meuse, this is known as a river flood

The risk of river flood of the Rhine in 2030 will increase with 54 to 230 percent the increase is caused by two factors. The former and major factor is caused by climate change that brings more frequent rain showers and peak discharges as result of melting snow in The Alps. The latter is caused by social-economical changes and increasing prosperity, through which more often alongside rivers will be built (Te Linde, 2011).

2.4.4 The Aedes emergency response playbook
In 2001 umbrella organization for Dutch housing associations Aedes, released an emergency response playbook for housing associations. The purpose of this playbook is how associations can respond whenever a disaster will occur. In cooperation with NIFV, the Dutch institute for physical safety, and with housing associations from Enschede and Amsterdam, this playbook consists of recommendations and checklists from former disasters in such that housing associations do not have to reinvent the wheel in case of a disaster.

It seems that emergency response plans do not have priority within housing associations, which is not unimaginable as there are matters that have higher priority. The playbook of Aedes is not obligatory for housing associations but it is developed as a instrument to support the organization when a disaster occurs. Would this be the reason why housing associations have not implemented the emergency response playbook in the company policies or would there be other obstacles?

The Aedes playbook consists of two parts, the first part contains of checklists that can be used immediately by housing associations. The checklists contains of 120 recommendations and possible actions that housing associations can elaborate on during the first phase (intervention) and the second phase (after-care) after a disaster.

Intervention checklist
The intervention checklist describes actions that are expected from housing associations after a disaster.

• Alerting executives
• Rescue operations and controlling disaster (effects)
• Accessibility and drivability
• Evacuation
• Marking out and fencing off
• Medical care
• Accommodation and nursing
• Identification of deceased persons
• Information and communication
• Extern
• Intern
• Registration of victims
• Provision of primary necessities
  o Before the granting of dwellings
  o Granting of dwellings
  o Other
• Psychosocial assistance
• Preventive public health and medical-hygienic measures
• Criminal investigations
• Damage recording
• Points of interest and recommendations human resources, logistics and cooperation
  o Human resources and logistics
  o Cooperation between housing associations

After-care checklist
The after-care checklist consists of recommendations and actions that elaborates on the following aspects:

• Active approach towards the victims, this will bring goodwill.
• The emergency rental procedure moved to the to the regular rental procedure as soon as possible. The victims should be registered immediately to avoid the chance of losing their data by time.
• Victims should still be treated as urgent in the regular rental procedure and it should be possible for victims to apply for accommodation at all housing associations. Coordination between associations is necessary to avoid that victims will apply at various associations. So there should be a single file with the available dwellings for the victims.
• Organize meetings after the intervention phase with the original residents and involve them in the recovery and redevelopment of their old place of residence. This will help the victims to process the disaster.
• Be open and clear in information if there are environmental issues as asbestos.
• Contact external consultants regarding to juridical and insurance issues.

The second part of the Aedes playbook contains four chapters of general information and relevant information for housing associations regarding to disasters and disaster responses. The chapters describes the following topics:

• Social responsibilities during disasters
• Prevention and preparation
• Intervention phase
• After-care phase

Social responsibilities during disasters
In this chapter the playbook briefly elaborates on the Wet Rampen en Zware ongevallen (which has been replaced by Wet Veiligheidsregio’s since October the 1st 2010), it describes the definitions of disasters and calamities but also on the different types of disasters.
There is clear description of the up scaling of disasters in this chapter. A disaster will be indicated with GRIP that stands for Gecoördineerde Regionale Incidentenbestrijdings Procedure and functions as the standard for multidisciplinary incident control. GRIP will
comes into force at large-scale disaster relief operations, when one of the executives of the involved emergency services is in need of structured coordination. Any executive of the police force, the fire department or medical services can initiate this procedure. There are four GRIP-levels that are different in range.

**GRIP 1**
The first alarm level is the rectification at the source, a GRIP 1 incident is limited to only the location of the source for example an apartment building or a plant that is on fire. During this phase the CTPI (Coordinatie Team Plaats Incident) is engaged and consist of commanding officers of the fire department, medical service and police force. In this phase source measuring is optional, but if long distance measurements needed the GRIP level can be up-scaled to GRIP 2.

**GRIP 2**
The second alarm level is not only the rectification of the source but also controlling of the effects on the surroundings. For example in a plant are chemicals produced and hazardous particles will come down in the surrounding. A ROT (Regionaal Operationeel Team) will be formed in the RCC (Regionaal Coordinatie Centrum). The ROT consists of the executives of the fire department, executives of the medical services, executives of the police force completed by executives of the municipal services, executives of logistics and the press-officer. The mayor will be informed about the situation and will be consulted by one of the executives of the ROT. It is up to the mayor if it takes the function as the commander in chief, if the mayor will fulfill this function the alarm level will be automatically up scaled to GRIP 3.

**GRIP 3**
The up scaling to GRIP 3 means the effects of the incident expanded from the surrounded areas of the incident to the or a part municipality and affects a (large) part of the population. The mayor will function as the commander in chief and a GBT (Gemeentelijk Beleids Team) will be formed (the already formed ROT will be placed under command of the GBT). The mayor and the ROT will operate from a GCC (Gemeentelijke Coordinatie Centrum), where coordinated strategic decisions will be formed. The mayor is responsible for information services to the population and to the provincial governor and Ministry of Interior and Kingdom Relations.

**GRIP 4**
GRIP 4 is the highest alarm level and comes into force when an incident affects multiple municipalities. The coordinating mayor has now a supporting as a directing role in the coordination of the policy between the mayors of the other municipalities. In this task the coordinating mayor will be supported by a RBT (Regionaal Beleids Team), which consist of the executives of the regional operation services, an advisory officer, an advisor on behalf of the municipal services and if necessary the Chief Public Prosecutor. The coordinating mayor and the RBT operates from a RCC (Regionaal Coordinatie Centrum).

An incident does not have to pass all alarm levels, in case of the Enschede fireworks disaster the alarm level went from GRIP 1 immediately to GRIP 3.
2.4.5 Local authorities and housing associations

Physical safety is the oldest core task of the government and comprises crime control, the avoidance and as much as is possible the prevention of accidents and disasters and an adequate control of it. Nevertheless physical safety is not only a task for the government. Civilians, organizations and the business sector have certain responsibility in this.

Concerning housing associations, their task is expressed in the services that they can offer in the field of housing. When an incident occurs and there is a sudden demand in housing, the housing associations are pointed out to arrange alternative housing to their extent. Because most of the Dutch local authorities do not have a department that concentrates on housing and the majority do not own dwellings, this task suits well within the social responsibility of housing associations, to arrange housing for those that are not able to find it themselves. Local authorities are pointed out to the housing associations as they posses a large stock of dwellings. This means that housing associations have to participate in the preparations and establishment of response plans of disaster control in order to tackle the housing problem.

Oosting mentions in the evaluation report of the Enschede fireworks disaster that the post-disaster housing process would be more effective if the preparations were more structured. To this extend Oosting states that it is remarkable that in the emergency response plan of DMO (Dienst Maatschappelijke Ontwikkeling) there has no attention been given to the role of housing associations (Oosting et al, 2001).

Oosting recommends in the evaluation report:

“The Commission recommends the local authorities of Enschede and local authorities in The Netherlands, to examine in the emergency response plans to determine if collaboration with housing associations is useful and to pay attention to covenants with local housing associations.”

How would this collaboration be in other cities between local authority and the housing associations? Both parties do actively collaborate in urban redevelopment, livability and quality of post-war neighborhoods, achieving more social-economic mixed neighborhoods all of them are stated in so called achievement agreements. What agreements can there made between local authorities and housing associations regarding to re-housing households after a flood?

Also on regional level it seems that the role that housing associations fulfill is not defined, in the Regionaal Crisisplan of Veiligheidsregio Groningen. Collaborating partners are:

- 23 local authorities of Groningen
- Regional fire brigade Groningen
- GGD/GHOR Groningen
- Regional police force Groningen
- Openbaar Ministerie
- Province of Groningen
- Dike boards Noorderzijlvest, Hunze and Aa’s and Wetterskip Fryslan
- Defence
Why would housing associations not be a partner of Veiligheidsregio Groningen, if Oosting mentioned in the evaluation report of the Enschede fireworks disaster that the housing process would be more structured if the housing associations would be incorporated in the emergency response plans of the local authority?

2.5 Conceptual model
As local authorities cannot tackle the housing problem after a flood with dwellings in possession of the local authority, simply because they do not have sufficient dwelling or they do not own dwellings at all, local authorities will need the assistance of third parties. This leads obviously to parties that possess large amount of dwellings: the housing associations. With the problem analysis in mind, this will lead to the following conceptual model for this research:

![Conceptual model](image)

2.6 Main research question
The problem analysis and conceptual model results in the following main research question:

“In the aftermath of a disastrous event as a flood, evacuated households will need alternative accommodation. Local authorities will request the assistance of housing associations to respond to the housing problem. What role can housing associations fulfill in the housing problem after a flood?”
2.7 Research objectives and intended result
The research objective is to compose a recommendation for Aedes, the umbrella organization for housing associations and the VNG, Vereniging van Nederlandse Gemeenten. The aim of this recommendation is to increase the collaboration between local authorities and housing associations regarding to post-disaster housing. Both Aedes and VNG can spread the result of the research through their network of housing associations and local authorities. Chapter 3 will elaborate more on the research objectives and how these will be achieved.

2.8 Type of research
The type of research that will be conducted is a qualitative research. This qualitative research will have a grounded theory approach. In paragraph § 3.1 there will be elaborated more in detail on the research method.

2.9 Graduation organization

2.9.1 Supervisors
Main supervisor Prof. dr. P. J. Boelhouwer
Chair Housing Systems

A second supervisor has not been found during the composition of the final research proposal. Prof. dr. ir. J. W. F. Wamelink has been approached to function as the secondary supervisor but the request has been rejected. The second supervisor will be searched outside the Faculty of Architecture, namely at the Faculty of Technology, Policy and Management in the section of Safety Science Group. Before the P2-examination a second mentor will definitely be found.

2.9.2 Graduation company
As a part of the research needs the collaboration of a housing association, a graduation company will simplify the progress. During an orientating interview with Paul Biersteker from Ymere, he mentioned that they are not working on post-disaster housing strategies and especially not after a flood. But what they currently working on is a risk inventory of which potential risk are threatening the dwelling stock of Ymere. The largest risks are conflagration, asbestos, carbon monoxide poisoning and legionnaires disease. Floods do not have high priority in the risk inventory, but as Paul Biersteker mentioned if other could take the initiative to research this it would be very welcome. A formal request has been sent out now to several housing associations for an internship.
3 Research methodology

3.1 Research design
To be able to answer the main research question, the research has been divided into several segments. In this paragraph there will be elaborated on these segments and following figure visualized the segments into a research design.

![Research diagram]

3.1.1 Grounded theory
The main research method in this research in Corbin and Strauss grounded theory. In grounded theory, the research begins with an area of study and allows the theory to emerge from the data. Grounded theories, because they are drawn from data, are likely to offer insight, enhance understanding and provide a meaningful guide to action.

This intensive, open-ended and iterative process involves data collection, coding (data analysis) and memoing (theory building). Because it is an iterative process, theory will emerge not likely from the first take (Corbin et al, 1990)
3.1.2 Collection of general data
The purpose of the segments 'Orientating interviews', 'Detailed interviews' and 'Case: Enschede' is to collect data from various parties to form a general idea concerning post-disaster housing strategies.

Orientating interviews
The 'Orientating interviews'-segment has been executed in the period between the P1- and the P2-exam and had the purpose to define the problem. Two housing associations were approached, namely De Alliantie in Amersfoort and Ymere in Amsterdam, to find out how they would deal with sudden housing demands after disasters. De Alliantie has composed a emergency response plan together with Grontmij in which the largest threats that can occur in the region were worked out. The emergency response plan was not based on the Aedes playbook, simply because it is too general written and has not been written from the perspective of a housing association but more from the perspective of the NIFV. A second interview took place with Ymere, they working on a risks inventory for the largest threats to their housing stock as well. What could be concluded from both interviews is that the housing associations are not aware of how important they are for local authorities in their emergency response plans.

Detailed interviews
After the P2-exam more detailed interviews will be conducted with Aedes, VNG, Twynstra & Gudde, Veiligheidsregio Groningen, Veiligheidsregio IJssel and local authorities. The local authorities that will be approached could be the local authorities
from Amersfoort or from Amsterdam, but other as The Hague, Rotterdam or in perilous regions as Groningen, Dordrecht, Nijmegen or Arnhem will suffice.

Case study Enschede
The re-housing process after the Enschede fireworks disaster is a perfect example how to house large numbers of households. The purpose of this case study is to find out how this process was organized, what the different stakeholders can recommend in order to compose a post-disaster housing instrument and their perspective on the Aedes playbook.

3.1.3 Transfer of know-how
After the collection of general data, there should be sufficient knowledge obtained to compose a (concept) post-disaster housing instrument for a local authority and a housing association.

3.1.4 Collection of unique data
In collaboration with a housing association a post-disaster housing instrument will be composed, tailored to local circumstances and to the emergency response plan of the local authority. Composing a instrument with a housing association and a local authority should highlight the unique constraints of a post-disaster housing instrument.

Intern at organization
An internship at an organization would make the research theme less abstract, as it will be possible to approach the theme pragmatically. The purpose of the internship is to be able to differentiate general constraints of post-disaster housing instruments, which applies for every housing association and the unique constraints of a post-disaster housing instrument that only applies for a particular housing association or a particular region.

Evaluation
An evaluation will take place, to discuss the post-disaster housing instrument with other housing associations. The aim of the evaluation is to discuss what constraints of the instrument are unique for a housing association and which applies in generally for housing associations. This evaluation will generate data for the recommendations that will be written for Aedes and for VNG.

3.1.5 Comparison of general and unique data
Now that general and unique data are collected and discussed with stakeholders, to test if the data is general or unique. It will be discussed with the graduation supervisors, the local authorities and housing associations that were approached in the ‘Detailed interviews’-segment, ‘Evaluation’-segment and ‘Case: Enschede’-segment. By triangulating the data, it will support the credibility if it is general or unique data.
3.1.6 Conclusions and recommendations
After the credibility is tested, the main research question can be answered. This will lead to the recommendation that will finally be written for Aedes and VNG, how the collaboration between a local authority and a housing association can become more effective to tackle the housing problem after a flood.

3.2 Detailed research questions
Prior to answering the main research question, detailed research question have to be answered. These detailed research questions support the process to find the answer for the main research question and are linked to the different segments of the research design.

Research question A:
“Which measures has been taken by housing associations to respond to disasters and the following housing problem?”

Research question B:
“How was the post-disaster housing process organized after the Enschede fireworks disaster?”

Research question C:
“How can local authorities improve the role of housing associations in their emergency plans in such way, that housing associations can respond more effective to the housing problem?”
Research question D:
“As the umbrella organization for housing associations how can Aedes increase the collaboration between housing associations and local authorities in relation to post-disaster housing?”

Research question E:
“As the umbrella organization for local authorities, how can VNG increase the collaboration between housing associations and local authorities in relation to post-disaster housing?”

Research question F:
“How can local authorities and housing associations collaborate more effectively on post-disaster housing according to experts in the field of physical safety?”

Research question G:
“What are general constraints of composing a post-disaster housing strategy and what are unique constraints for a housing association?”

Each research question is linked to a segment with as purpose to collect data. All research questions consist of several themes, which have been divided into sub-questions.

3.2.1 Research questions in relation to the research design

Figure 11 Research questions in relation to the research design (author’s illustration)
3.2.2 Method of approach research question A

“How measures has been taken by housing associations to respond to disasters and the following housing problem?”

Purpose
The purpose of this research question is to find out what preparations have been taken by housing associations and in what form. This research question should answer the following aspects:

Emergency response plans
- Are there response plans available in the organization?
- If they are, are they familiar with the Aedes playbook and how did they implement it into their organization?
- If they did not implement the Aedes playbook, how did they compose an emergency response plan? What were constraints?

Response to the housing problem
- How do they currently respond to incidents?
- What preparations or agreements have been already established to respond to the housing problem?
- How do housing associations think to deal with waiting lists and friction vacancy, when the demand for housing became larger after a flood?

Research method
This research question will be answered by conducting interviews with two or three housing associations and a literature study.

- Interviews
  Housing associations that are located in the perilous regions will be interviewed about their current preparations to disasters and the following housing problem.

- Literature study
  The literature study will elaborate on the Aedes playbook and literature regarding to GRIP.
3.2.3 Method of approach research question B

“How was the post-disaster housing process organized by the local authorities and housing associations after the Enschede fireworks disaster?”

Purpose
The purpose of this research question is to evaluate how the local authority and housing associations in Enschede organized the re-housing process after the fireworks disaster. This research question should answer the following aspects:

Organization
• How did they deal with issues as the vacant stock and waiting lists?
• How was the allocation of dwellings organized?
• What were implications during the re-housing process?

Recommendations
• What can the ‘experienced’ housing associations recommend regarding to a post-disaster instrument?
• Which preparations do the housing associations have to take in order to assist the local authorities more efficiently?
• What kind of measures can the local authorities take, in such that housing associations can work more efficient on the re-housing process?

Aedes playbook
• The housing associations cooperated with Aedes to compose the Aedes playbook, how did they implemented the playbook in their organization after the Enschede fireworks disaster?
• What recommendations the ‘experienced’ housing associations give to other housing associations?

Research method
This research question will be answered by conducting interviews with housing associations from Enschede and the department DMO of the local authority.

• Interviews
To be able to answer this research question, the cooperation of the following housing associations is necessary:
  o Domijn, Enschede
  o De Woonplaats, Enschede
  o Gemeente Enschede

Alternative parties that might be able to answer the questions concerning the Aedes playbook are:
  o Site Woondiensten, Doetinchem
  o Ressort Wonen, Rozenburg
  o Woningstichting Vaals, Vaals
  o Rochdale (former Patrimonium), Amsterdam
3.2.4 Method of approach research question C

“How can local authorities improve the role of housing associations in their emergency plans in such way, that housing associations can respond more effective to the housing problem?”

Purpose
The purpose of this research question is to evaluate how local authorities are prepared for disasters and how they think they can improve the role of housing associations to respond efficiently to the housing problem after a flood. This research question should answer the following aspects:

Emergency response plans
• Are housing associations currently involved in emergency response plans of the local authority?
• How do local authorities think how they can assist housing associations more effective in the housing problem?
• How can the collaboration become more structured, so housing associations can respond more effective on the housing problem after a flood?
• How can housing associations be more efficient for local authorities?
• What kind of instrument would be effective for both parties in a post-disaster situation?

Research method
This research question will be answered by conducting interviews with local authorities of cities located in the perilous regions.

• Interviews
  Local authorities that are located in the perilous regions will be interviewed about their current preparations to disasters and the following housing problem.
3.2.5 Method of approach research question D

“As the umbrella organization for housing associations how can Aedes increase the collaboration between housing associations and local authorities in relation to post-disaster housing?”

Purpose
The purpose of this research question is to find out the importance of post-disaster housing within Aedes. This research question should answer the following aspects:

Emergency response plans
• What developments are there within Aedes related to post-disaster housing after the publication of the playbook?
• Why do housing associations have such a passive attitude towards post-disaster housing and how can it be changed?
• What kind of instrument would improve the role of housing associations regarding to post-disaster housing?

Collaboration
• How can Aedes increase the collaboration between housing associations and local authorities?
• What is needed to increase the awareness of housing associations and local authorities?

Research method
This research question will be answered by conducting interviews with Aedes, the umbrella organization for Dutch housing associations.

• Interviews
This interview will be conducted with Aedes, which might be a very helpful stakeholder in this research.
3.2.6 Method of approach research question E

“As the umbrella organization for local authorities, how can VNG increase the collaboration between housing associations and local authorities in relation to post-disaster housing?”

Purpose
The purpose of this research question is to find out the importance of post-disaster housing within VNG and if there is already has been thought of within the organization. This research question should answer the following aspects:

Emergency response plans
- What measures has already been taken by VNG in the field of post-disaster housing?
- What kind of instrument would improve the role of housing associations regarding to post-disaster housing?

Collaboration
- How can VNG increase the collaboration between housing associations and local authorities?
- What is needed to increase the awareness of housing associations and local authorities?

Research method
This research question will be answered by conducting interviews with VNG, the umbrella organization for Dutch local authorities.

- Interviews
  This interview will be conducted with VNG, which might be a very helpful stakeholder in this research.
3.2.7 Method of approach research question F

“How can local authorities and housing associations collaborate more effectively on post-disaster housing according to experts in the field of physical safety?”

Purpose
The purpose of this research question is to find how experts in the field of physical safety think how local authorities and housing associations can collaborate. This research question should answer the following aspects:

Collaboration
- How do they think the collaboration can become more effective to tackle the housing problem after a flood?
- How can we increase this, what steps should be taken and by who?
- What kind of means or instruments can increase the effectiveness?

Research method
This research question will be answered by conducting interviews with experts in the field of physical safety.

- Interviews
For these interviews the following parties will be approached:
  - Veiligheidsregio Groningen
  - Veiligheidsregio IJssel
  - Twynstra & Gudde, Leo Zaal section Law and Order and Security
3.2.8 Method of approach research question G

“What are general constraints of composing a post-disaster housing instrument and what are unique constraints for a housing association?”

Purpose
The purpose of this research question is to distinguish the differences between general and unique constraints of post-disaster housing. By interviewing other housing associations, the similar constraints as of the post-disaster housing instrument that has been composed with the cooperating housing associations could be categorized as general constraints. This research question should answer the following aspects:

General and unique constraints
These research questions will be formulated during and after the composition of the post-disaster housing strategy, as not all constraints are now already known. Questions that can be formulated so far are:

• Do other housing associations have to deal with similar constraints?
• Can the similar constraints be categorized as general constraints as it will be applicable for all housing associations in The Netherlands or are the similar constraints unique for the city or region?

Research method
This research question will be answered by conducting interviews with (partner) housing associations of the housing associations for which a post-disaster instrument has been composed.

• Interviews
There will be interviews conducted with housing associations that will be approached in a later stage. What might be a point of attention is to approach housing associations from various regions. By interviewing housing associations from various regions the general constraints will hopefully be more obvious. This goes as well for a selection of housing associations in the same city or region, the unique constraints will than be evident.
3.3 Selected case

For this research case material is fundamental to obtain general data regarding to post-disaster housing. The most prominent case study for this research is the Enschede fireworks disaster.

3.3.1 Enschede fireworks disaster, The Netherlands

The Enschede fireworks disaster was a catastrophic fireworks explosion that occurred at a fireworks depot in Enschede on 13 May 2000. This fireworks depot was located in the centre of the neighborhood Roombeek and destroyed more than a half of the total area (74 hectare). On January 1, 2000 the number of dwellings in Roombeek were approximately 1,400 of which 580 were owner-occupied and an equal number were owned by housing association. The remaining were dwellings hired out by private individuals. The explosion instantly destroyed two hundred dwellings and another three hundred were severely damaged and were declared unfit for habitation by the local authority. Also outside the disaster area numerous dwellings were damaged, the local authority of Enschede estimated that 1,500 dwellings from outside the disaster area were damaged. The fireworks disaster resulted in 950 wounded, 22 deaths and 1,250 persons lost their place of residence.

![Figure 12 Map of Roombeek with firework depot located in the center of the neighborhood (Oosting et al, 2001)](image)

In the aftermath of the explosion approximately 1000 evacuees, sought refuge at one of the appointed crisis centers. An unknown number sought refuge at family or acquaintances.
In the emergency response plan of the local authority of Enschede, it is stated that if household cannot return to their residence within 36 hours, alternative housing should be sought of such quality that common domestic activities could continue. The responsibility of this task is appointed to DMO.

In the evening of 13 May 2000 DMO initiated together with the housing associations of Enschede the preparations of the re-housing process. Within six weeks 560 households were re-housed into alternative housing. Despite a relative short re-housing process, there were still implications with the allocations of dwellings. DMO might be formally responsible for this process, the responsibility of the organization and execution of the re-housing process is appointed to the housing associations.

**Stakeholders**
To conduct this case study several stakeholders from the Enschede fireworks disaster have to be approached. The following stakeholders are from importance, to the housing associations requests for interviews has been send but nor replied. The local authority still needs to be approached for an interview.

*Domijn*
Gert-Jan Kamperman
No response yet

*De Woonplaats*
Tim Leusink
No response yet

*Gemeente Enschede*
The DMO-department still has to be approached.
### 4 Provisional table of contents of the final report

**Foreword**

**Abstract**

**Table of contents**

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5 Planning

5.1 Planning in relation to the research design
Following figure visualizes the planning in relation to the research design. The ‘Orientating-interviews’-segment runs until the P2-examn and sufficient input has been generated from these interviews to continue with the remaining research segments.

5.2 Planning until P3
Between the P2- and the P3-examn two segments are from importance, namely the ‘Detailed interviews’ and ‘Case: Enschede’. The expectation is that the analysis of these two segments and an additional literature study will not take a time span of ten academic weeks. These segments should be done, within a time span of five weeks. This means that in academic week 3.4 (calendar week 9 is an extra week) the ‘Detailed interviews’ and ‘Case: Enschede’ should be finished.

5.3 Planning until P4
As the expectation is that the segments ‘Intern at organization’ and ‘Evaluation’ will be more intensive, the remaining weeks of the third period will be useful to spend on these segments of the research. A time span of eleven weeks should be sufficient to elaborate on ‘Intern at organization’, ‘Evaluation’, ‘Compare data’, ‘Conclusions’ and ‘Recommendation’. The P4-examn could be planned for academic week 4.5.
Bibliography


Veiligheidsregio Groningen, 2011. Regionaal crisisplan
Appendix I List of abbreviations

CTPI          Coordinatie Team Plaats Incident
DMO           Dienst Maatschappelijke Ontwikkeling
GBT           Gemeentelijk Beleids Team
GCC           Gemeentelijke Coordinatie Centrum
GRIP          Gecoördineerde Regionale Incidentbestrijding Procedure
NIFV          Nederlands Instituut Fysieke Veiligheid
RBT           Regionaal Beleids Team
RCC           Regionaal Coördinatie Centrum
ROT           Regionaal Operationeel Team
VNG           Vereniging van Nederlandse Gemeenten
Appendix II Aedes playbook