Story of Hope

Experience, Educate and Empower
Building a more climate-resilient and prepared society

Master thesis
Aldo van Zee

List of Acronyms

CRF	Croix-Rouge Française
ICRC	International Committee of Red Crosses and Red Crescents
IA	International Assistance
IFRC	International Federation of Red Crosses and Red Crescents
IH	Internationale Hulp
M&F	Marketing and Funding
NBS	Nature-Based-Solutions
NCTV	Nationaal Coördinator Terrorismebestrijding en Veiligheid
NH	Nationale Hulp
NIPV	Het Nederlandse Instituut voor Publieke Veiligheid
NLRC	The Netherlands Red Cross
RfD	Research for Design
RtD	Research through Design
SDD	Strategic Design Direction
WCE	Water, Climate and Environment unit

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Preface

On the 13th of April 2025, I completed my first marathon. This was not a spontaneous decision, I prepared for it. I trained consistently, gradually increasing my distance to understand how my body and mind would respond. I educated myself on nutrition, endurance, and the mental challenges of long-distance running. By changing my behaviour and committing to this goal, I empowered myself to cross the finish line.

My motivation was clear: I wanted to finish the marathon. That clarity made it easier to adapt my lifestyle and build new habits. But what happens when the goal is not as immediate or tangible? What if we need to adapt not for a personal challenge, but for a future shaped by the uncertainties of climate change?

The effects of climate change are slowly unfolding, and many of us in the Netherlands have not yet experienced the full force of its consequences. Our current way of life still feels sufficient, comfortable, and safe. Without a clear and present danger or a well-defined goal, why would we change our behaviour?

In this thesis, I explore how we can encourage and inspire people in Dutch society to become more aware of the future, where climate-related disasters will occur more frequently, and encourage the Dutch society to start adapting today. My aim is to understand the behavioural shifts necessary for long-term resilience, even when the need for change is not yet urgent or visible.

Summary

As climate change increasingly impacts communities globally, societies must adapt to their new standards. While the impact of climate-related disasters for the Netherlands remains relatively modest, leading to a lower sense of urgency and limited public awareness or preparedness. This discrepancy presents both a challenge and an opportunity for the Netherlands Red Cross (NLRC).

This thesis introduces the Triple-E framework: Experience, Educate & Empower, as a strategic approach t enhance climate resilience and behavioural change in Dutch society. Despite the Netherlands being relatively unharmed by recent climate disasters, growing risks such as flooding, wildfires, and extreme weather highlight the need for anticipatory action. However, the lack of visible threats leads to low public awareness and minimal personal preparedness. The Triple-E framework is the way to bridge this gap as it introduces a design strategy grounded in behavioural science.

Experience
People have to be able to relate. Therefore, relatable simulations of future climate scenarios are proposed to build personal relevance and engagement.

Educate
Translate the experience into understanding by contextualization using real-world testimonials and clear, relatable information to build competence.

Empower
Provide actionable tools (e.g. emergency kits, working-with-nature) to enable autonomous, meaningful action.

The framework is based on behavioural theories such as the Self-Determination Theory, which emphasizes the need for autonomy, competence, and relatedness to drive lasting behavioural change. Field studies in Dutch communities (Herkenbosch and Valkenburg) reinforced the need for proactive communication and social engagement strategies, even when direct disaster experiences do not translate into preparedness.

This framework is designed to be adaptable to different audience segments, from the general public to people in a vulnerable position and scalable from low-tech board games to immersive VR experiences. It offers practical tools for the NLRC to integrate international expertise into national programs and to position the NLRC not just as a responder, but as a climate adaptation leader.

The thesis concludes that through emotional engagement, contextual education, and practical empowerment, Dutch citizens can be guided from passive awareness to proactive resilience, strengthening both societal preparedness and the NLRC’s humanitarian mission.

Table of content

Acknowledgements

Catelijne
Thank you for your support and providing directions on my research approach. You encouraged me to use the Research through Design method, which was new to me. This approach turned out to be the basis of my Triple-E-Framework.

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Het Nederlandse Rode Kruis
Thank you for welcoming me in the Red Cross family. I want to thank all colleagues, national, international, IFRC and The French Red Cross for the welcome feeling you gave me being part of the Movement. I carry a Red Cross and Red Crescent in my heart.

Introduction

As climate change continues to reshape our world, its impacts are becoming more visible and severe, particularly in regions already vulnerable to extreme weather events. Internationally, communities are adapting out of necessity, facing disasters more frequently and developing long-term strategies to reduce risk. In contrast, the Netherlands remains relatively untouched by the direct consequences of climate-related disasters, leading to a lower sense of urgency and limited public awareness or preparedness. This discrepancy presents both a challenge and an opportunity for the Netherlands Red Cross (NLRC).

This thesis explores how internationally acquired knowledge and practices, particularly around working-with-nature and climate adaptation, can be translated to the Dutch context. Central to this effort is the development of a design-led approach that motivates people to act before a disaster occurs, not after. The result is the Triple-E framework: Experience, Educate, Empower. A strategic model to help Dutch citizens, including those in vulnerable positions, become emotionally connected to future risks, informed about their options and equipped to take meaningful action.

The research is conducted in three phases.

Phase one involved an internal analysis of the NLRC. This phase is for internal use only, due to confidential information. However, the conclusion of this phase leads to a Strategic Design Direction, which forms the basis of the second phase.

In phase two, a Research through Design approach was used to understand how people might be inspired and empowered to proactively prepare for climate risks, despite not yet having experienced them firsthand. Drawing from behavioural theories and field research, this phase introduced the story of hope, a narrative that supports the framework by promoting voluntary preparedness through emotional engagement and future-oriented thinking.

Finally, phase three focused on the implementation potential of the framework, showing how it could be applied across Dutch society, adaptable to different communities and especially supportive for people in vulnerable situations.

This thesis argues that the Triple-E framework offers a practical, inclusive, and psychologically grounded path towards a more climate-resilient Netherlands. Where people are not only aware of future risks, but ready and able to face them.

Phase 1

Internal analysis

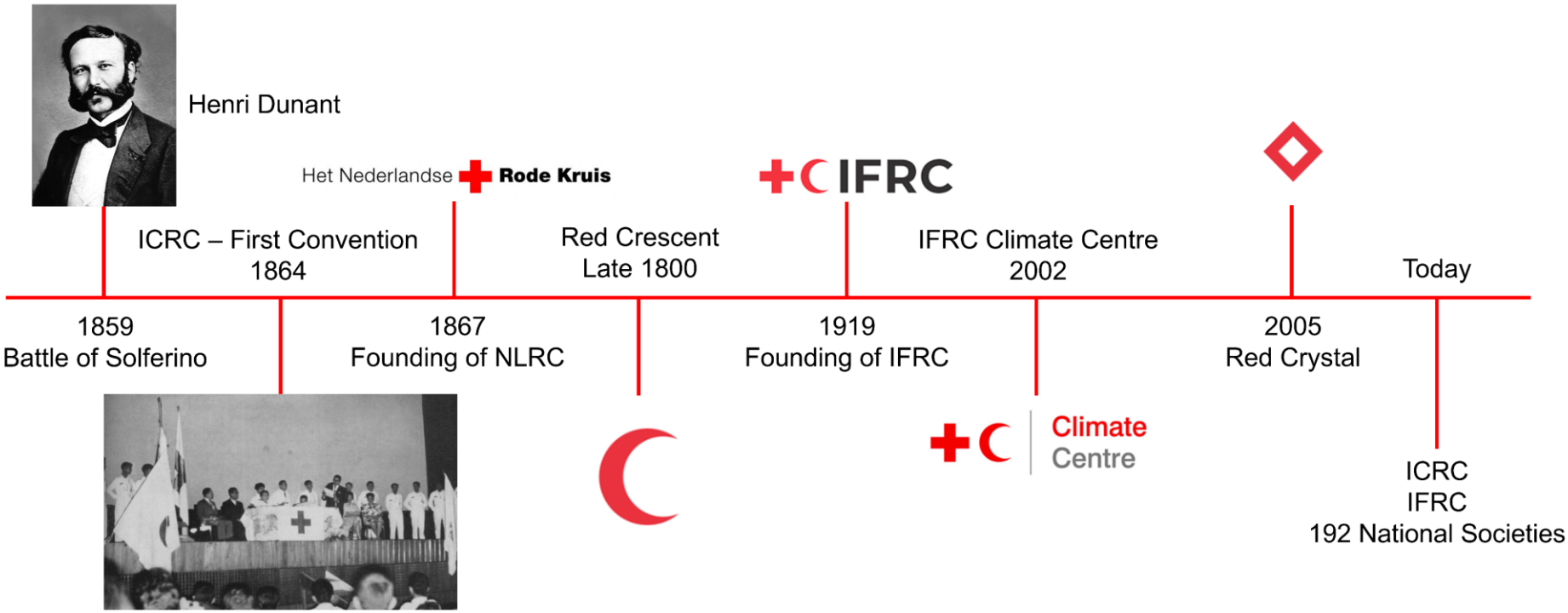


Figure 1: Timeline of the Red Cross and Red Crescent Movement

1. Internal analysis

To understand the scope and scale of this project, it is important to first understand The Netherlands Red Cross (NLRC). This chapter will first explain the organisation and its mission. It will then dive into the internal analysis of the NLRC, done by interviews and meetings with different departments. This analysis results in a Strategic Design Direction (SDD).

1.1 The Movement

1.1.1 History

The Red Cross Movement was founded in 1863 by Henry Dunant (figure 1), the year after his book ‘A memory of Solferino’. In this book Henry called for better care for wounded soldiers during wartime. One year later, in 1864, the first Geneva Convention was established, in which governments agreed on taking care for wounded soldiers, from all sides. It also introduced the emblem for this medical services, a Red Cross on a white background (International Committee Of The Red Cross, 2024).

The first national society was founded in 1863, in Germany. It took four more years till The NLRC was founded in 1867 by King Willem III. Its goal was to help anyone in need, inside and outside the Netherlands (Het Nederlandse Rode Kruis, 2023). Today, there are 191 National Societies connected to the Red Cross.

In the late 1800’s the Red Crescent was introduced, to avoid perceived religious implication of the Red Cross. In 2005 the Red Crystal was added. The Movement uses its official Movement logo. The logos are also displayed in figure 1.

1.1.2 ICRC

With the first Geneva Convention, the International Committee of the Red Cross (ICRC) was born. The ICRC’s objective is to ensure protection and assistance for victims of armed conflicts, encouraging the development of international humanitarian law (IHL) and promoting respect for it by governments and all weapon bearers (International Committee Of The Red Cross, 2020). The ICRC focuses on protecting the lives and dignity of victims of war.

1.1.3 IFRC

The International Federation of the Red Cross and Red Crescent Societies was founded in 1919 in Paris by Henry Davison. It believes that the compassion and expertise, shown by volunteers during wartime, could also be uses during peacetime, by improving the health of people in countries that had suffered during the first world war. The IFRC does not only focus of health after war, but also humanitarian aid after natural disasters, responsive and proactive. The IFRC has an overall coordination role (IFRC.org, n.d.). The headquarter of the IFRC is located in Geneva, Switzerland, and has several regional and/or country offices. The IFRC connects National Societies with knowledge on certain areas with the local National Society needing expertise on certain disaster.

1.1.4 National Societies

The IFRC consist of 191 Red Cross and Red Crescent Societies. The role of each individual National Society varies per country, but are united in the Fundamental Principles. Each National Society is not a governmental or non-governmental organisation. They are auxiliaries to public authorities in the humanitarian field (IFRC.org, n.d.). The National Societies have to support their public authorises with humanitarian services, during war and/or peace, while taking into account the Fundamental Principles of the Red Cross and Red Crescent Movement.

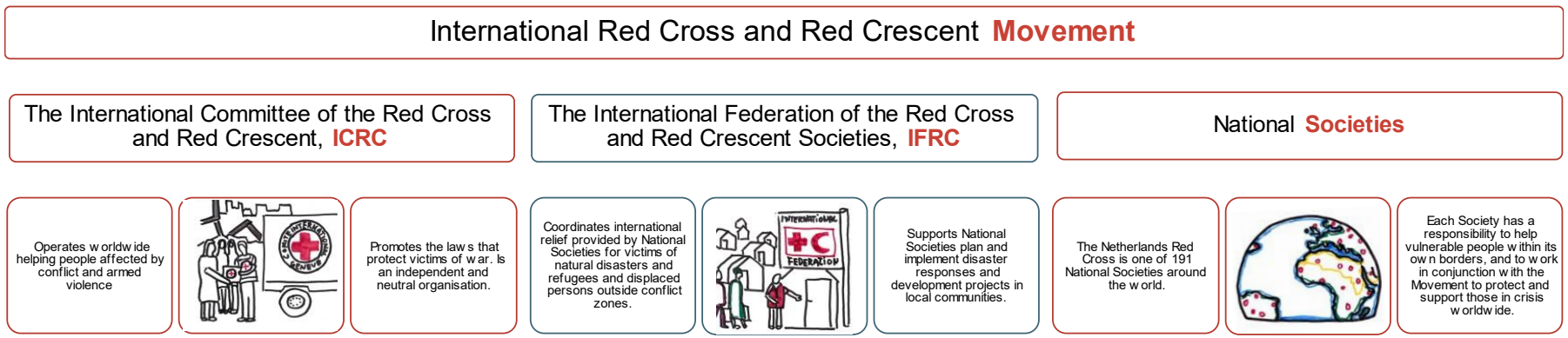


Figure 2: The Movement

1.1.5 The Fundamental Principles

The ICRC, IFRC and National Societies are united through seven fundamental principles, which are the ethics to support people in need during armed conflicts, natural disasters and other emergencies (IFRC, 2015).

Humanity
Help others regardless of who they are or what they have done.

Impartiality
The Movement does not discriminate on the basis of anything. Aid should be proportional, those in greatest need receive aid first.

Neutrality
The Movement never takes sides: political, racial, religious or ideological.

Independence
The Movement is independent. Although National Societies do have an auxiliary role in the humanitarian services of their governments, the Movement and the National Societies operate independent.

Voluntary service
The Movement does not prompt in any manner by desire for gain.

Unity
There is only one Red Cross or Red Crescent Society per country. The society needs to be open for all.

Universality
The National Societies have equal status, duties and responsibilities in helping each other.

Figure 3: The 7 Principles

1.2 The Netherlands Red Cross

The Netherlands Red Cross (NLRC) is one of the 191 National Societies. The NLRC's auxiliary role is to provide aid to people, who are victims of an armed conflict, disaster or other calamity. The NLRC has also a responsibility to help with the goals of the International Red Cross Movement. The NLRC works and implements activities and projects by themselves in the Netherlands, including the Caribbean part of the Kingdom of the Netherlands. Besides their domestic work, the NLRC supports other National Societies in their operations and ongoing programming.

The internal analysis is for internal use only and is therefore included in the confidential and client only appendix. Employees of the NLRC can find the full text of phase one in their intranet.

It is important to understand the difference between a disaster and a hazard. Therefore, the description provided by the United Nations (2009) is used:

'A hazard is a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.'

'A disaster is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.'

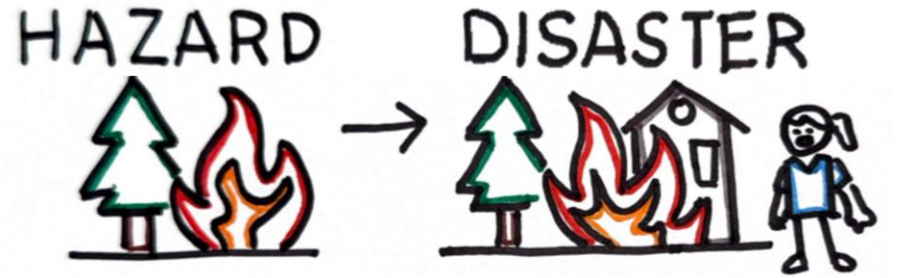


Figure 4: Hazard vs Disaster

In the interviews with different departments of the NLR a discrepancy between what citizens expect after a disaster, direct help from the government, and what the government expects, everyone is able to survive the first 72 hours, was found.

Internationally people not only prepare through emergency kits, they adapt. They take preventive, mitigation and adaption actions to minimize the impact of a disaster. They have to adapt, because climate change related disasters happen already. Climate change is strongly contributing to humanitarian crises, physical and mental health, as 83% of disasters worldwide are caused by climate change (IPCC, 2023).

Climate change related disaster do not happen in a frequent number in the Netherlands or the impact is not impactful enough to encourage the Dutch citizens to prepare themselves for the future. Only one out of four persons is prepared with an emergency kit (noodpakket) (Van Straaten et al., 2024).

This discrepancy and the difference between the national and international situation formed the basis for a design statement.

The internal analysis is used to formulate a Strategic Design Direction (SDD), which will be used as the starting point for the next phase.

"In order to strengthen the awareness and preparedness of Dutch Citizens for the increasing risks of future climate related disasters,

I wish them to take action and become equipped to respond effectively to future climate hazards,

by giving them the possibility to experience the increasing risks next to informing and engaging them."

Phase 2

Story of Hope

2. Story of Hope

In phase one, the following Strategic Design Direction (SDD) was formulated:

"In order to strengthen the awareness and preparedness of Dutch Citizens for the increasing risks of future climate related disasters, I wish them to take action and become equipped to respond effectively to future climate hazards, by giving them the possibility to experience the increasing risks next to informing and engaging them."

This SDD provides the foundation for the next phase of this project, which will be elaborated upon in this chapter. First, the chosen design method, Research through Design (RtD), will be introduced. This method resulted in the formulation of a primary research question, accompanied by three sub questions, which will be elaborated in this chapter. The outcome of this design approach serve as the foundation of the final framework design: Experience, Educate and Empower.

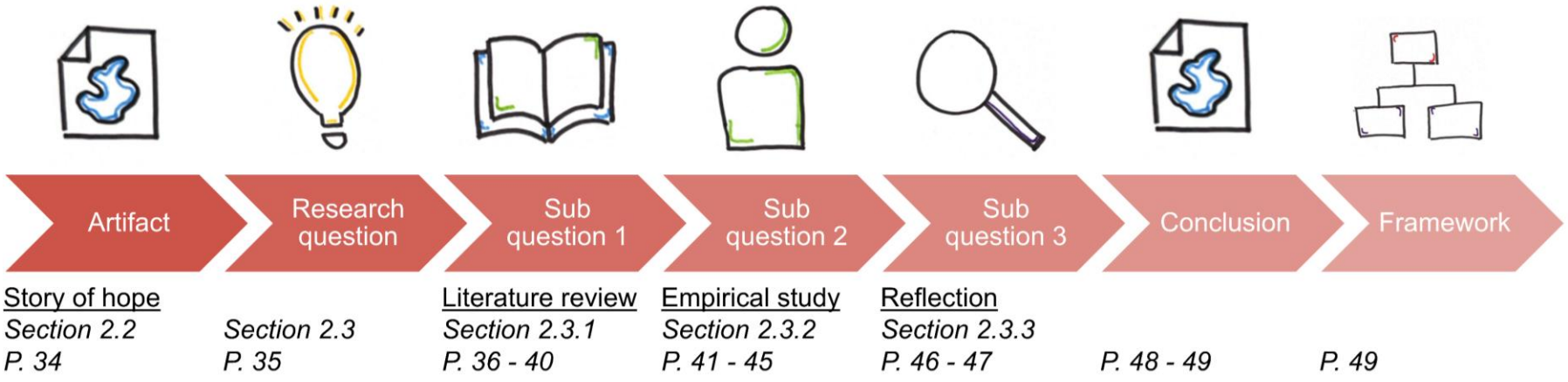


Figure 5: *Research through Design – approach*

2.1 Research through Design

Research through Design (RtD) is a design method where design itself is used as a method to generate new knowledge. Instead of only aiming to create a finished product, RtD explores possibilities, raises new questions and develops insights through the act of designing (Stappers & Giaccardi, 2014). This approach fits the SDD well, as the SDD does not predefine a possible solution. Creating concepts lead to new questions which lead to new knowledge. Unlike the Research for Design approach, where research is used to improve or support the design. According to Stappers & Giaccardi (2014), RtD processes involve collaboration with motivated stakeholders and/or participants. They are typically conducted as (large-scale) collaborative efforts rather than in isolation. This aligns with the findings of chapter one, as the national and international departments can be unified through a collaborative process, in which the lessons learned internationally are translated into the domestic context by raising awareness and applying a working-with-nature approach as a preventive measure against disasters caused by climate change. This shifts the focus from mere preparedness to a combination of prevention and preparedness.

Stappers & Giaccardi (2014) outline different ways to structure a RtD process. For this design process, a programmatic approach suits best. The SDD is defined a broad and overarching way.

The steps for a programmatic RtD approach are displayed in figure 5. First the area of exploration is defined through a research question, which guides the research project. The second step is to develop initial design probes. Stappers and Giaccardi (2014) call these probes artifacts. The research process revolves around the artifact. Artifacts are broader than prototypes. An artifact can take various forms. The artifact does not need to be a physical object, it can also be a blueprint, sketches or other conceptual representations. The third step, as differentiated by Stappers & Giaccardi (2014), is to conduct iterative design cycles, building on previous findings and refining the design inquiry. The next step involves identifying patterns and insights to develop design principles and a conceptual framework. Finally, the gained knowledge is communicated through various formats, like showcasing the artifacts.

2.2 Hope as an artifact

To create the artifact for this RtD method, I draw on the paradox identified during the interviews (phase one). When people are directly impacted by climate change through disasters, and when these disasters occur frequently, people become aware of climate change and are more likely to prevent or minimize the impacts on a longer term. However, those who have not yet experienced the impact of climate change in a disastrous way, tend not to prepare or take preventive action. This results in a paradoxical situation where a disaster is needed to raise awareness and hopefully change behaviour. The ultimate goal is to ensure people are as well-prepared as possible before the disaster happens. Ultimately making the NLRC redundant on responsive aid after a disaster and providing the opportunity to fulfil other mandates as requested by the government.

The international narrative is driven by hope rather than fear. Nationally, the focus is on preparedness, ensuring survival during the first 72 hours after a disaster. The international assistance department (IA) focuses, beside response, on prevention and mitigation, by adapting to new circumstances, with approaches like 'working-with-nature'. Through this approach, the impact of disasters can be minimized. This perspective is hope-driven: if everyone contributes, change and adaptation become possible and the impact of disasters can be minimized. This sentence of hope becomes the artifact for the RtD approach.

Figure 6: *The story of hope; Stop being sceptic, if we all do our bit, we can minimize the impact*

2.3 Inspire to prepare

The story of hope, the artifact, seeks to reinforce, encourage and inspire a change in behaviour. Dutch citizens struggle to take preventive measures, due to a lack of urgency. The disaster does not occur yet. This challenge leads to the following research question:

How can people be inspired and empowered to proactively prepare themselves for emergencies, without the occurrence of an actual disaster?

To answer this question, three sub questions are formulated:

1. *Which behavioural principles can effectively motivate people to adopt behaviours?*
2. *What barriers and motivators influence individuals' decisions to engage in emergency preparedness activities?*
3. *What communication strategies are most effective in inspiring long-term preparedness without causing unnecessary fear or anxiety?*

The following paragraphs will elaborate on each sub question individually. Section 2.3.1 will dive into sub question one, based on a literature review approach. Sub question two will be elaborated in section 2.3.2 on the basis of an empirical field research. Sub question three will be answered in 2.3.3, using a reflective method on sub questions one and two and literature.

2.3.1 Behavioural principles

In order to achieve behavioural change, it is essential to have first an understanding of human behaviour. This section will therefore explore and explain human behaviour. Kahneman (2011) states that we, humans, are not good at predicting events, particularly if the forecast are made within a short timeframe. Causing us to calculate and predict incorrect conclusions, but we make ourselves believe that our judgment was correct. It is important to understand what motivates people to adopt new behaviours. Human behaviour is a complex process. We fool our own, without realising it (Kahneman, 2011). Leading to the following sub-question

Which behavioural principles can effectively motivate individuals to adopt new behaviours?

How do we think?

Wendel (2020) distinguishes two ways of thinking namely, reactive thinking (system one) and deliberative thinking (system two). System one is fast and automatic, without being conscious. It uses past experiences and simple knowledge to give an intuitive evaluation, mostly on familiar situations. System two is complex. We rationalize and analyse the unknown situation, which limit the amount of information we can handle. Kahneman (2011) calls these types of thinking fast (system one) and slow (system two). System one covers most of our daily behaviour. System two acts when the results of system one are not the once expected. We believe that we are consciously in charge of our minds, all the time, which we are not (Wendel, 2020). According to Wendel (2020) decision-making is often driven by automatic heuristics, emotions and social influences. People rely on heuristics and cognitive shortcuts to make decisions.

How and why do we behave the way we do?

Heuristics and cognitive biases drive how we behave and our decision-making (Wendel, 2020). To understand these heuristics and biases, a few are differentiated. People draw conclusions about the unknown based on recognizable and familiar information. Gigernezer & Goldstein (2011) call this the recognition heuristic. If people recognize something, they trust it's important and make a decision (Gigerenzer & Goldstein, 2011). However, a person might not have an experience with a disaster. They do not recognize it as urgent, and therefore underestimate the need to change.

People tend to prioritize information that reinforces our existing perspectives, the confirmation bias (Wendel, 2020). Tversky & Kahneman (1973) identify in their research two heuristics building on this phenomena, the representativeness heuristic and the availability heuristic. The representativeness heuristic involves assessing the likelihood of an event based on its similarity to a known category or how closely it is conceptually related.

When an event closely resembles the key characteristics of a familiar category, people are willing to judge it as more likely, regardless of its actual statistical frequency (Tversky & Kahneman, 1973). In contrast, the availability heuristic is based on the ease with which examples or scenarios can be brought to mind. This reliance on availability has significant implications for real-world judgment. Such judgments, though intuitive, are exposed to systematic biases, particularly when memorable cases are not representative of the broader statistical reality. People simplify these scenarios to assess future events, leading to twisted judgement, especially in contexts of risk and uncertainty frequency (Tversky & Kahneman, 1973). Kates (1962) describes this in the context of flooding, stating that people depend too much on experience as the latest flooding experience sets the limit of expected loss and damage.

People prefer to maintain their current habit (Thaler et al., 2010) as people are likely to stick with the status quo (Wendel, 2020). If a person is confronted with many options, lacking time or energy to think them trough, people are most likely to not change anything (Wendel, 2020). Thaler et al., (2010) build on this by introducing the default option, the option that will effect if the decider does not make an active decision, whether this option is beneficial or not. It is important to indicate what happens if the decider chooses to do nothing. If nothing changes, the current situation continues as it is. If a person is in a familiar and recognizable situation and the situation is not changing yet, it is likely that this person does not take preventive action, as the current situation is recognized as safe. This lines up with Wendel's (2020) finding that people cannot forecast their feelings and behaviour in future situations. If people forecast their feelings, they overemphasize the probability of positives events over the probability of negative events (Sharot, 2011), known as the optimism bias. According to Sharot (2011) people change their assumptions on the future more on positive information than to negative information. People believe that disaster are unlikely to affect them personally. People focus on the most important thing, the present, even if these immediate needs put the future benefits at risk. Wendel (2020) describes this as the present bias.

How do we adopt new behaviour?

Behaviour change often begins with a decision, influenced by heuristics and biases, as discussed previously. People tend to adopt behaviours that feel familiar, require minimal effort or align with past experiences. Long-term behavioural adaptation depends on intrinsic motivation, self-regulation and well-being as described by Ryan and Deci (2000). In their self-determination theory (SDT) Ryan and Deci (2000) explain that people have an intrinsic motivation and tendency toward activity, curiosity, and psychological growth, but are also vulnerable to passivity and disengagement, depending on the social context. In their research Ryan and Deci (2000) provide three psychological needs which encourage behavioural change: people need to feel in control (autonomy), people need to feel capable to act (competence) and people need to feel connected to others (relatedness). When these needs are fulfilled or supported, people show higher motivation, greater commitment and better performance.

The social environment plays a critical role (Ryan & Deci, 2000) and is always in place (Sunstein, 2014). Nudging offers a practical tool for designing the environment (Sunstein, 2014; Thaler et al., 2010). Sunstein (2014) describes nudging as a liberty-preserving approach that guides people toward certain choices while still allowing them the freedom to choose otherwise. To achieve this freedom, Thaler et al. (2010) suggest to keep the nudges transparent and reversible by introducing default rules (Sunstein, 2014), as they can enhance perceived autonomy. To improve the sense of competence (Ryan & Deci, 2000), it is important to reduce cognitive overload and decision fatigue (Thaler et al., 2010), by simplification (Sunstein, 2014), clear feedback (Sunstein, 2014; Thaler et al., 2010) and reminders (Sunstein, 2014). The use of social norms by emphasizing what most people do (Sunstein, 2014) help with satisfying the need for relatedness, as it reinforces a sense of social connection and shared behavioural standards (Ryan & Deci, 2000). People need inclusion, membership or acceptance. Their need to belong needs to be fulfilled (Forsyth, 2014). However, nudging also presents potential risks if not implemented with care. Sunstein (2014) acknowledges that poorly designed or non-transparent nudges can become manipulative, paternalistic or undermine trust. Ryan and Deci (2000) warn that these externally controlled behaviour, even when successful in the short term, may fail to produce sustained motivation or psychological well-being. Nudging can serve as a powerful tool to facilitate self-determined behaviours, as long as they are paired with transparency, respect for individual agency and meaningful engagement.

Conclusion

For most of our daily behaviour, we act fast and intuitive, system one (Kahneman, 2011; Wendel, 2020). This fast and intuitive acting is based on heuristics and biases, such as past experiences, familiar situations and known scenarios. If our reaction did not provoke the outcome expected, we shift two our deliberative and slow thinking, system two (Kahneman, 2011; Wendel, 2020). We use our ratio to determine how to react in a future scenario. If we try to predict the future scenario, we are likely to predict it with optimism. We are bad at seeing risks we might face. If nothing needs to be changed now, we will not change, even if it impacts our future.

In order to activate and motivate people to change, people need to feel related, competent and autonomous, according to the self-determination theory (Ryan & Deci, 2000). If these needs are fulfilled, people might change their behaviour and adapt to a future scenario. Nudging would be a helpful tool to encourage people what to do and how to act, but it is important to always keep the nudges transparent (Thaler et al., 2010).

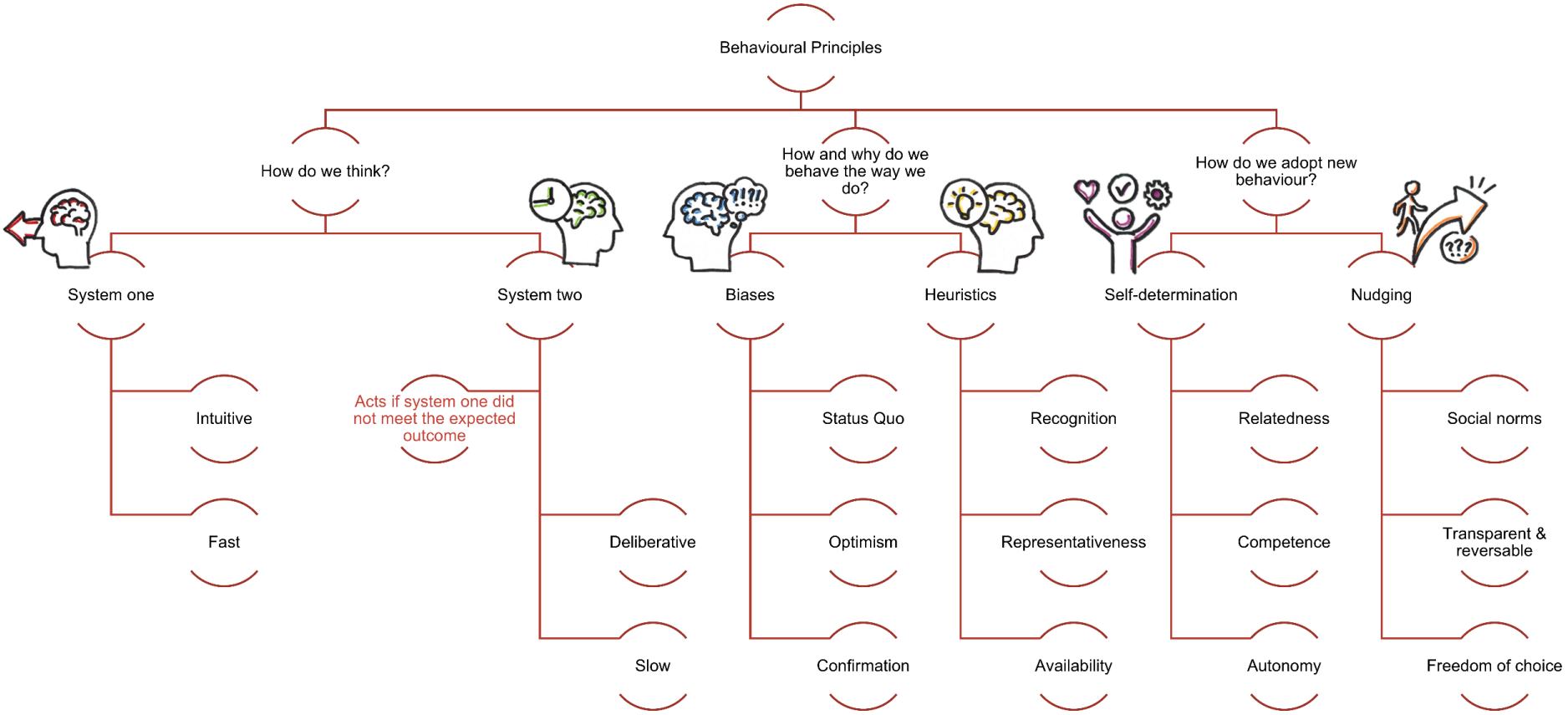


Figure 7: Behavioural Principles

Figure 8: *Herkenbosch 19 February 2025 [Photos: Aldo van Zee]*

2.3.2 Preparing for emergencies

The previous section studied the mechanisms and principles of behaviour and behavioural change, particularly principles influencing individual decision-making. People prefer to maintain their current habit (Thaler et al., 2010), but what if the status quo changes and people experienced a (potential) disaster, based on the availability heuristic, these experiences can shape future behaviour (Tversky & Kahneman, 1973). This resulted in the following sub-question:

What barriers and motivators influence individuals' decisions to engage in emergency preparedness activities?

To explore this question empirically, during February 2025, field studies were conducted in Herkenbosch and Valkenburg. Per case study, contexts will be introduced, followed by a detailed explanation of the research methodology and a presentation of the key findings.

Herkenbosch

One of the five biggest climate related threats in the Netherlands are wildfires, as discussed in phase one, *1.2.6 future scenarios*. This scenario occurred in Herkenbosch in April 2020, providing a concrete context for examining individual responses to emergency situations. In 2020, a wildfire developed in Nationaal Park De Meinweg, resulting in the evacuation of the neighbouring village of Herkenbosch. The fire was first noticed on Monday, April 20th. During the night of Tuesday, April 21st, to Wednesday, April 22nd, all residents were asked to leave their homes. As a result, 4200 individuals were unable to return to their residences for two days. The NLRC was also deployed in response, mobilizing 60 personnel (either volunteers or employees), 800 beds and four busses, to support the evacuation (Van Duin et al., 2020). This evacuation occurred during the start of the COVID-19 pandemic. Therefore, the news coverage of this event was low.

To gain deeper insights if this experience changed the individual perspectives on emergency preparedness, a qualitative field study was conducted. The aim was to understand how individuals perceive and respond to potential crisis situations, by exploring people's experiences, attitudes and awareness related to the evacuation of Herkenbosch. In this study eight individuals were approached for participation of which four agreed to share their experiences in semi-structured interviews lasting between 15 and 45 minutes. People who did not want to participate named that the experience impacted their lives and they did not want to think or talk about it. The conversations were audio recorded with the participants' consent. The data was later transcribed and analysed using thematic analysis. Recurring concepts were identified, which were then organized into themes, as identifying themes are one of the most important tasks in qualitative research (Ryan & Bernard, 2003).

After conducting the interviews and analysing the transcripts, several key themes emerged from the data. The summary of the interviews can be found in appendix A. These themes reflect participants' thoughts, concerns and behaviours related to this evacuation and current emergency preparedness. In the following section, the main findings are presented, organized by the central themes identified: the evacuation process, individual experiences and attitudes, perception of risks and the use of emergency kits. The results of this qualitative interview, per theme, can be found in table 1.

Table 1: Interview themes and quotes Herkenbosch

Theme	Summary	Quote (EN)	Quote (NL)
Evacuation process	Initial disbelief about the seriousness of the situation.	"At first, I didn't believe it. Only when the neighbour told us, I realized it was serious."	"Eerst geloofde ik het niet. Pas toen de buurman het zei, besefte ik dat het serieus was."
Evacuation process	Evacuation was calm, and most people left without panic.	"They told us to leave calmly. When we did, the streets were still empty."	"Ze zeiden dat we rustig moesten vertrekken. Toen we dat deden, waren de straten nog leeg."
Evacuation Process	Most went to stay with family instead of using the shelter.	"We called our son in Roermond and stayed there. No need for the shelter."	"We belden onze zoon in Roermond en zijn daarheen gegaan. De opvang was niet nodig."
Individual Experiences	No preparation was made before leaving.	"We didn't prepare anything. Just took a toothbrush and underwear."	"We hebben niks voorbereid. Gewoon een tandenborstel en ondergoed meegenomen."
Individual Experiences	The experience was strange, but not unpleasant.	"It was a bit strange, but not bad. I didn't find it really unpleasant."	"Het was even vreemd, maar niet erg. Ik vond het niet echt vervelend."
Individual Experiences	Damage from a past earthquake was much more impactful than the wildfire.	"The earthquake in 1992 was worse. We had serious damage to the house."	"De aardbeving in 1992 was erger. We hadden flinke schade aan het huis."
Perception of Risk	Main concern was smoke, not visible flames.	"You couldn't see the flames, just the smoke. That was the real danger."	"Je zag geen vlammen, alleen rook. Dat was het echte gevaar."
Perception of Risk	Residents identified changing wind direction as a critical factor in risk increase.	"The wind direction was different than usual, that's what made it dangerous in my opinion."	"De windrichting was anders dan normaal, dat maakte het volgens mij gevaarlijk."
Perception of Risk	No fear during the wildfire due to perceived distance and visible control by emergency services.	"I saw it during the day – it was far away and well controlled by the fire brigade."	"Ik zag het overdag – het was ver weg en goed onder controle bij de brandweer."
Perception of Risk	Underestimation of the danger	"We figured: the fire still has to cross the main road – it won't reach us."	"We dachten: die brand moet eerst nog de grote weg over – dat gebeurt niet zomaar."
Current Attitudes	Would not leave immediately unless the danger is clearly visible.	"Unless the flames are right here, I wouldn't rush. I'd take it easy."	"Tenzij de vlammen hier al zijn, zou ik niet haasten. Ik zou het rustig aan doen."
Current Attitudes	Would now check the municipality website for confirmation.	"Now I'd check the municipality's website sooner. We never did that before."	"Nu zou ik sneller op de website van de gemeente kijken. Dat deden we toen nooit."
Current Attitudes	Reflects on the experience as unusual but not traumatic.	"It was a strange experience, but not really unpleasant. Just something that had to be done."	"Het was een vreemde ervaring, maar niet echt vervelend. Gewoon iets wat moest."
Emergency kits	Still no real emergency kit in the house.	"We don't really have a kit. Maybe a few supplies, but nothing special."	"We hebben eigenlijk geen pakket. Misschien wat spullen, maar niks bijzonders."
Emergency kits	They didn't have a kit at the time but now have more awareness and supplies.	"Back then, we just took toothbrushes. Now we have more – documents, supplies, a checklist."	"Toen namen we alleen tandenborstels mee. Nu hebben we meer – papieren, spullen, een checklist."

Table 1 displays the themes, summary and a quote. The original quote was in Dutch (NL) and is translated to English (EN). The first theme that came up is the evacuation process. The participants underestimated the need to evacuate. A study by Van Duin et al. (2020) found that between 59% and 69% of citizens of Herkenbosch did not expect the need to evacuate. However, when their environment started to leave or repeated the message participants evacuated as well. One participant said: '*At first, I didn't believe it. Only when the neighbour told us, I realized it was serious.'* This is in line with findings of Ryan and Deci (2000), as they state that the social environment plays a critical role in how people behave, we have to feel related in order to act. All participants stayed with family during the time.

The next theme that came forward is the individual experiences, during the evacuation. The evacuation was not perceived as fearful. Although participants were not prepared for the immediate evacuation, people did not experience it as stressful. One participant said that a previous experience of an earthquake (1992) was more impactful than the evacuation.

This leads to the next theme, the perception of risk. The participants did not see the wildfires as a direct danger. *'We figured: the fire still has to cross the main road – it won't reach us.'* The danger was underestimated, which lines up with Wendel's (2020) finding that people often misjudge danger. One participant did see the danger, as the wind direction was unusual.

This introduces the next theme, their current attitudes. Participants underestimated the future danger. However, they will check messages provided by local governments earlier. *'It was a strange experience, but not really unpleasant. Just something that had to be done.'*

Leading to the last theme, emergency kits. None of the participants has an emergency kit present. Some had a few items ready, but not packed in one kit. Which lines up with the findings of Montaño and Kasprzyk (2008) that even after an event, people do not necessarily change their future behaviour.

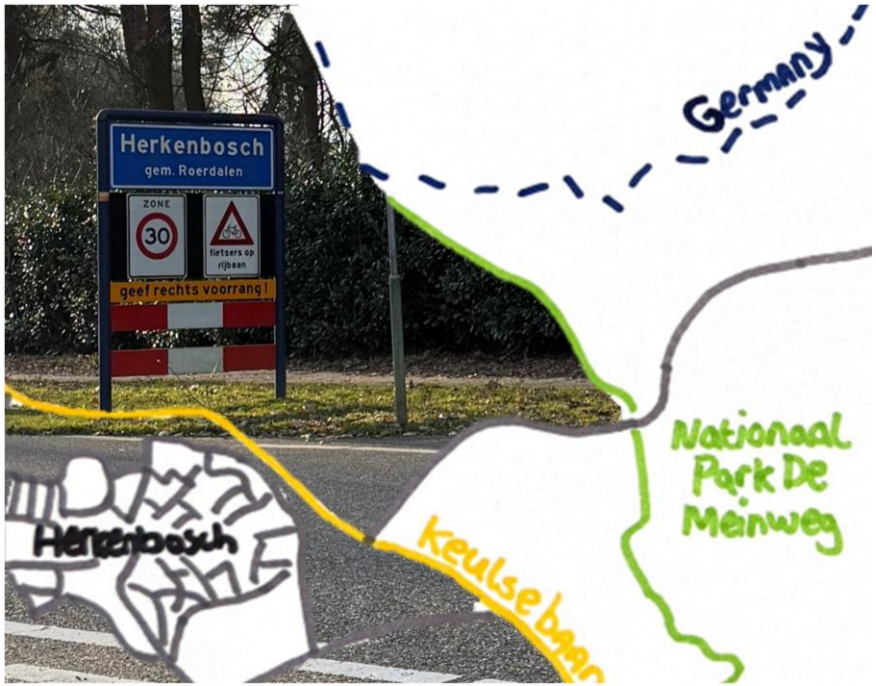


Figure 9: Situation of Herkenbosch, the main road (yellow) & Nationaal Park De Meinweg

Valkenburg

Another scenario discussed in phase one, *1.2.1.e future scenarios,* are floodings. Floodings are less likely to happen, but have a huge impact. In July 2021 large parts of Limburg where affected by extreme rainfall, resulting in record-breaking water levels and widespread flooding. The town of Valkenburg was among the most severely impacted areas (Van Heerlingen et al., 2022). Although floodings are less likely to happen, they are impactful.

To understand the impact of these floodings, a likewise qualitative field study was conducted. In the area hit by the floodings, five participants were approached to see if they wanted to participate in sharing their experience. However, only one participant was interested to share their experience. The other four did not want to participate. '*It has caused me a great deal of misery.'* and *'I want to forget it.'* were reasons for not wanting to participate in the study. The local tourist office advised to be cautious. *'You can always try, but people have already talked much about it. They appeared on television so many times.'* One person did participate in this research, resulting in a 15 minute conversation. This interview was recorded and the transcript provides insights in how this participant experienced the flooding. The themes that came forward are displayed in table 2.

The participant was not directly hit by the disaster, but did experience the impact of it, as friends and neighbours were directly hit. The event evoke feelings of panic and helplessness. *'It was really intense'*. The participant described this event as unpredictable, which forms a barrier to proactively adapt. However, after the event, people helped each other, which was perceived as pleasant.

Table 2: Interview themes and quotes Valkenburg

Theme	Summary	Quote (EN)	Quote (NL)
Experience during flood	There was chaos and fear during the flood event. The fear of water entering their home was real, although their house was on higher ground.	"It was really intense... we just saw the water rising more and more."	"Het was echt heel heftig... we zagen het water gewoon steeds hoger komen."
Emotional impact	The experience left a lasting emotional impact, that resurfaces whenever it rains heavily or the water level rises again.	"Then we already think, oh my God... not again."	"Dan denken we al van oh, mijn God... niet weer."
Lack of Preparedness and Doubts About Effectiveness	Despite their experience, the participant has not significantly prepared for future floods. They feel certain disasters are hard to prepare for because of their speed and unpredictability.	"You can't really prepare for it."	"Je kan je niet echt op voorbereiden."
Community Support and Solidarity	After the flood, the local community came together to help each other. There was mutual support, coordination with the fire department, and shared efforts to clean up and recover.	"Actually, everyone really helped each other."	"Eigenlijk heeft echt iedereen elkaar geholpen."
Government and Emergency Services Role	The fire department eventually helped by providing sandbags, but the water often came too quickly for those measures to be fully effective.	"They did get sandbags, but it was really at the very last moment."	"Ze kregen wel zandzakken, maar dat was echt op het allerlaatste moment."
Communication and Information Flow	Most updates come through social media and local group chats, which are used to warn each other when danger approaches. There's a strong informal network of communication.	"On Facebook... things are posted immediately."	"Op Facebook... worden meteen dingen gezet."

Figure 10: *Valkenburg [Photos: Aldo van Zee]*
Top: renovation in the city centre
Bottom: water levels – top bar: 69.80 M + NAP 2021

Conclusion

This study explored individual experiences, perceptions and behaviours during an emergency situation. The aim is to understand what factors influence engagement in preparedness activities. The findings reveal several barriers to being prepared for a disaster. A barrier was the low perceived risk. Participants underestimated the threat, especially during the wildfire. Participants relied on the physical cues rather than the official warnings. In both cases, the unpredictability of the event contributes to a sense that preparation is either unnecessary or ineffective. Resulting in the fact that none of the participants had a complete emergency kit ready. This suggest that being prepared is not part of their routine behaviour. This aligns with the idea that experiencing a crisis does not automatically result in long-term behavioural change (Montaño & Kasprzyk, 2008).

Besides barriers, several motivators are identified. Social influence played a critical role in the decision-making process. Participants only evacuated once neighbours did so, which is supported by Ryan and Deci's (2000) argument that relatedness is an important driver of action. The social support during and after the events, was perceived pleasant and supportive in both cases. This provides a feeling of hope. If we all do our bit, help each other and support, we can minimize the impact.

2.3.3 Communicating the message

The previous sections (*2.3.1 & 2.3.2)* examined the mechanisms behind behaviour and behavioural change. Experiencing a disaster can shift risk perceptions and potentially trigger behavioural change. However, the findings of the interview show that none of the participants actually changed their behaviour, even after experiencing a disaster. The self-determination theory as explained by Ryan and Deci (2000) provide three key psychological needs which encourage behavioural change: autonomy, competence and relatedness. Effective communication should allow people to see themselves in the story (relatedness), feel confident in their ability to act (competence), and maintain a sense of autonomy over the choices they make (autonomy). This raises the following question:

What communication strategies are most effective in inspiring long-term preparedness without causing unnecessary fear or anxiety?

In order to create a strategy for comminating the message and to empower people to change their behaviour, this section draws on the principles from the self-determination theory. The following sections will examine these conditions in more detail.

'Hey, that looks like my street'

People forecast their future too optimistic (Wendel, 2020) and the lack of experiences with disasters in people's own life, create a dangerous cocktail, as people might be too optimistic and believe that a disaster will not happen to them (Sharot, 2011; Wendel, 2020). When messaging about a possible disaster in the future, people need to recognizes themselves in the information they receive (Gigernezer & Goldstein, 2011). Relatability is key (Ryan & Deci, 2000), as people must feel that the message speaks to them, in their context and their community. In addition to making the message personal, making it social is also important, as people like to belong to a group (Forsyth, 2014). Montaño and Kasprzyk (2008) provide the Community Popular Opinion Leader (CPOL). The CPOL uses a popular opinion leader to promote behaviour change in groups, by educating the leaders and provide arguments to encourage trust and reduce emotional distance, normalizing the idea among peers. Moreover, people's individual behaviour can be seen as the consequences of the social norms and expectations of their in-groups (Niedderer et al., 2008). Messaging can build on this by introducing prevention, mitigation, adaptation and preparedness as a shared norm.

‘So, it can happen to me. But it is too big, I cannot do anything, can I?’

Even if people relate to a message, they are unlikely to act unless they believe they are competent (Ryan & Deci, 2000). People need actions in small, doable steps in order to feel competent. Perceived behavioural control is important in shaping intentions and action, according to Azjen’s (1991) theory of planned behaviour. Only if a person has met the requirements, resources and intends, that person will succeed. West and Michie(2020) provide a similar model, the COM-B model, emphasising that motivation is likened to a person’s individual actual and perceive capability and opportunity to act. Educating about self-control can encourage this belief and should be done in a clear, practical and encouraging way, using examples, visual tools, simple checklist or demonstrations.

‘It is me, I can do something, today!’

If people feel related and competent to act, it is important to provide them with the feeling of being in control or autonomy as Ryan and Deci (2000) named this need. People rather react to messages that respect their freedom of action and avoid coercion. Nuding can be a tool to preserve freedom of choice, as default nudges enhance perceived autonomy (Sunstein, 2014). Messaging should invite action, not demand it. Respect personal autonomy while activating planned behaviour, by framing actions as a personal choice, with flexible pathways, communicators can encourage intrinsic motivation and reduce resistance.

Figure 11: *Relate, feel competent and keep autonomy*

Conclusion

The aim of phase two was to create a foundation for the opportunity found in phase one. During the interviews in phase one it became clear that the Dutch citizens are not preparing themselves for future climate related disaster, as these disasters are not happening yet, or do not happen in a frequently or impactful way to encourage change. Internationally there is no option not to change, as the disasters happen in a more frequent way.

To tackle this paradox, the Research trough Design method was chosen. This paradox breaths hope, the artifact. This artifact is not tangible, but provided leads for investigation. Is hope a way to encourage people to change their behaviour and adapt on a future scenario, without the future happing? Resulting in the main research question: How can people be inspired and empowered to proactively prepare themselves for emergencies, without the occurrence of an actual disaster? This research question was tackled via a literature study, an empirical field research and a reflection combining both findings.

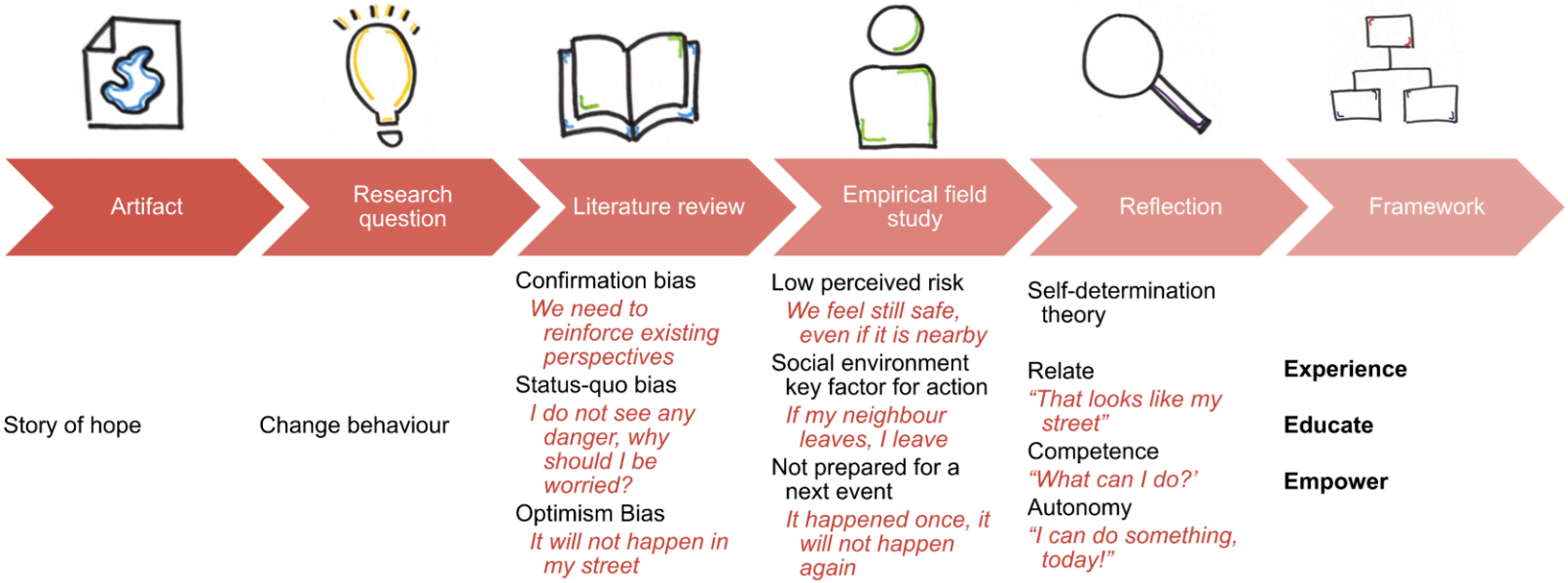


Figure 12: *Research through Design method with outcomes*

We, people, do not want to change our current behaviour if it is not necessary, and if we have to change, we forecast our future with optimism. The optimism bias, as described by Sharot (2011) was also found during the field study in Herkenbosch. Participants saw the smoke hanging above their houses, but did not feel the urgent need to evacuate, they felt still safe. People misjudge danger (Wendel, 2020). Participants only started to act after their neighbours and community did so. The social environment plays a critical role in how people behave (Ryan & Deci, 2000). Participants did not have an emergency kit at home. They are not prepared for a future evacuation. They do feel the urgent need for such a kit. However, the story of hope assumes that after an event people want change their behaviour and habits.

The self-determination theory of Ryan and Deci (2000) provides a template for behavioural change to build on. Climate change related disasters in the Netherlands feel remote, a distant reality. People cannot recognize themselves in images and stories of disaster happening outside of the Netherlands. They need to feel related to the future situation. After they feel related, they need perspectives on how to adapt. They need to understand the likelihood and impact of the situation. They need to feel competent to act. Only competence is not enough. They need autonomy. They must believe that they can and must act. They have to do it.

This is the essence of the story of hope. If we feel related, competent and in control, we are more likely to change and adapt to challenges ahead.

To encourage and empower Dutch citizens to proactively prepare themselves, people have to Experience the future, be Educated and feel Empowered. Resulting in the Triple-E framework:

Experience
People need to feel related. They have to start believing that a climate change related disaster can happen to them. They have to experience it, in a relatable and recognizable situation.

Educate
After experiencing it is important to immediately teach people about the risks, likelihood and impact of their previous experience. They need to leave this phase feeling competent to act. To achieve this, the international story and knowledge within the NLRC can be used conventionally. People around the world face likewise situations, they adapt and can handle the impact in a better way. Working with nature as a red tread.

Empower
In this stage, people know their future, they feel competent to act, but do not know how. The NLRC becomes the key player in bridging citizens with all available resources and options already existing.

Phase 3

Experience, Educate & Empower

3. Experience, Educate & Empower

The Research through Design approach of phase two resulted in three elements to tackle the strategic design statement. In order to encourage and engage people to prepare themselves for the future, people have to be able to relate themselves with the problem, feel competent to act, while keeping their autonomy. This resulted in a framework: Experience, Educate and Empower, displayed in figure 13. Phase three will explain the three elements of the framework, by providing design examples on how to implement each step based on two different target groups.

The target groups will be discussed first: the broad Dutch public and people who are in a vulnerable position, who are approach by the NLRC in a more direct way. Each target group has its own requirements, which will be elaborated in *3.1 Target Groups*. The elements of the framework will be discussed in order, starting with experience. Per element a short introduction, a list of design requirements per target group and a possible solution will be presented. This phase can be used as a guideline for the framework.

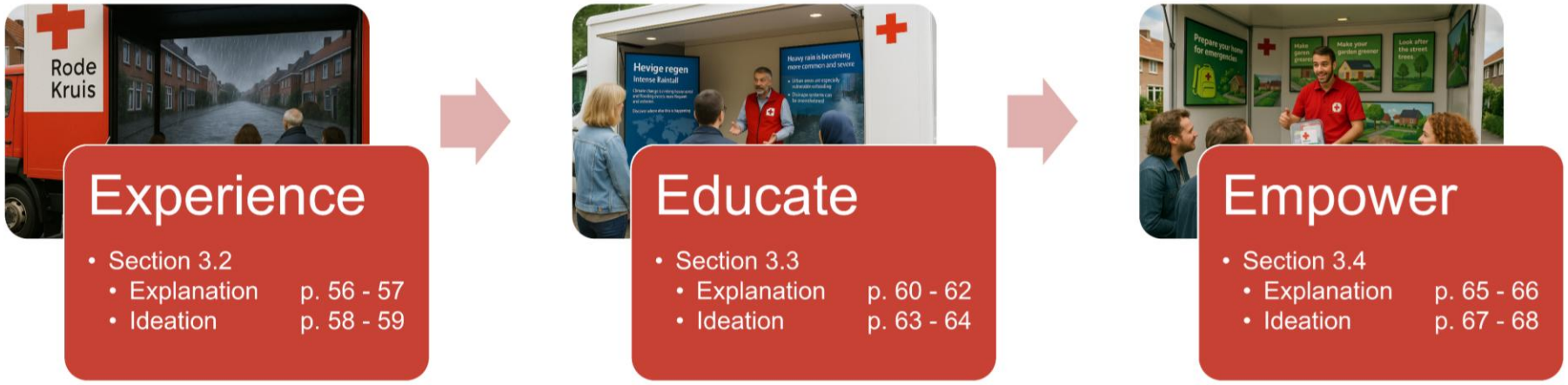


Figure 13: *Reading guide Phase 3*

Learning from the Movement

Experiencing to educate and empower is not something new within the movement. Croix-Rouge Française (The Frence Red Cross, CRF) has a experience based tool to make people aware and promote the need for an emergency kit. Their insights from *“Living in 2050: An Immersive Experience to Explore Climate Crises”* helps to outline the importance of the framework and form a good example of why experiencing a crisis can lead to make people eager to learn about their future and empower them to prepare. The summary of the interview with one of the designers behind the experience can be found in the confidential appendix C. This interview will be used in throughout this chapter, it provided beside requirements and guidelines for the framework, also insights in how effective experiencing can be.

Living in 2050

The "Living in 2050" experience developed by the CRF is an interactive, low-tech, physical exhibition designed to raise awareness about the future impacts of climate change in a relatable and engaging way. Participants are guided through a fictional scenario set in the year 2050, where they step into the role of climate migrants facing various challenges like floods, wildfires, and landslides. Through role-play, they assess their own vulnerability (based on living conditions, social ties, and financial capacity), pack an emergency bag under pressure, and make choices that affect their fictional journey. This creates a sense of urgency and emotional involvement. The experience ends by connecting the fictional future to real-world testimonials from people currently facing such crises, prompting reflection on what actions participants can take today. It's designed to be accessible, scalable, and emotionally impactful. Turning abstract risks into concrete, personal experiences.

The "Living in 2050" experience had several positive outcomes, including increased engagement, emotional connection, and a stronger sense of urgency among participants regarding climate risks. It successfully encouraged conversations about preparedness, with some local units using it to guide people in building their own emergency kits. The low-tech, adaptable format made it accessible across different regions (like Reunion Island) by customizing the content to reflect their local risks. However, there were also challenges. The tool’s reach depended on volunteer engagement, which varied by location, and follow-up actions were not always consistent. While the futuristic framing helped ease anxiety, the emotional weight of the topic still required sensitive assists. Overall, despite some limitations, the experience proved to be an innovative and impactful way to raise awareness and motivate preparedness.

3.1 Target groups

The NLRC wants to focus on the people who are the most vulnerable for disasters. However, the NLRC is also seen as trustful when the general Dutch citizen wants to prepare, as discussed in section 1.2.1.d Preparedness. Providing public information can benefit from this framework as well. Both target groups require different approaches within the framework. This paragraph will describe both target groups resulting in two sets of requirements and personas. The requirements are used to develop a guideline to use the framework.

3.1.1 Dutch society

The NLRC emphasizes the importance of informing and involving the Dutch society to build a more resilient and inclusive community (Het Rode Kruis, 2021). To reach this group, communication must be clear, fact-based and easily accessible. The Dutch society in general means that people have different backgrounds, such as educational level, cultures, religions or age groups. The language needs to be accessible for everyone, without jargon. However, it is impossible to reach the whole Dutch society at once. The content should always be adapted to the way it is presented, for example an exhibition in a museum attracts a specific group of people, whereas a safety fair at the local fire department, in which other emergency services also participate, reach a different audience. The setting of the experience, educate and empower framework varies. Each setting comes with its own challenges and requirements. Content should be adaptable, by keeping the goal to empower citizens to take meaningful action and providing a sense of shared responsibility. While emphasizing the diversity of Dutch society by being culturally sensitive and inclusive.

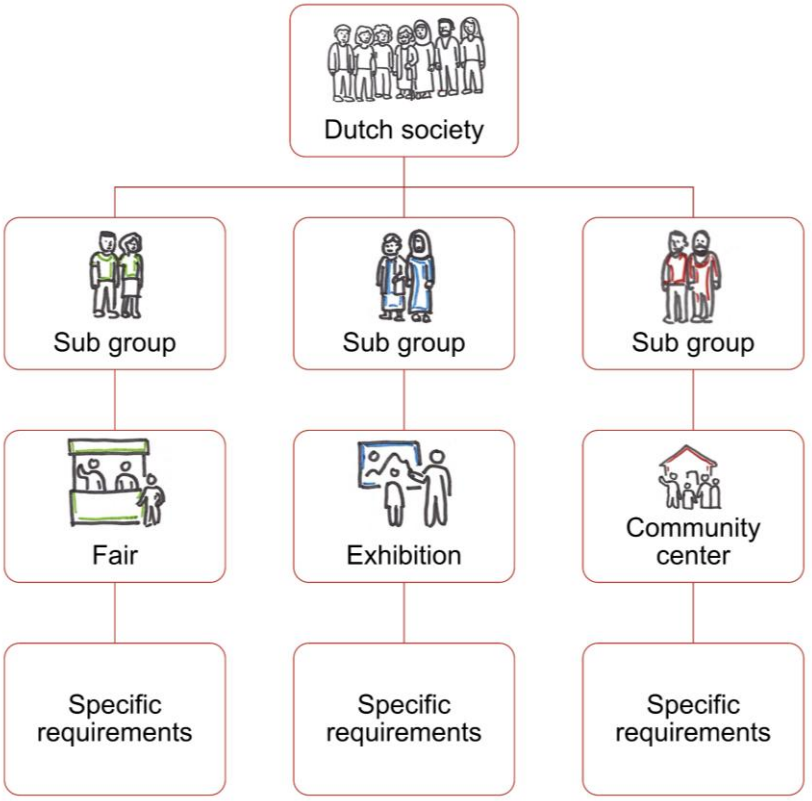


Figure 14: Decide who to reach and how to reach

3.1.2 People in a vulnerable position

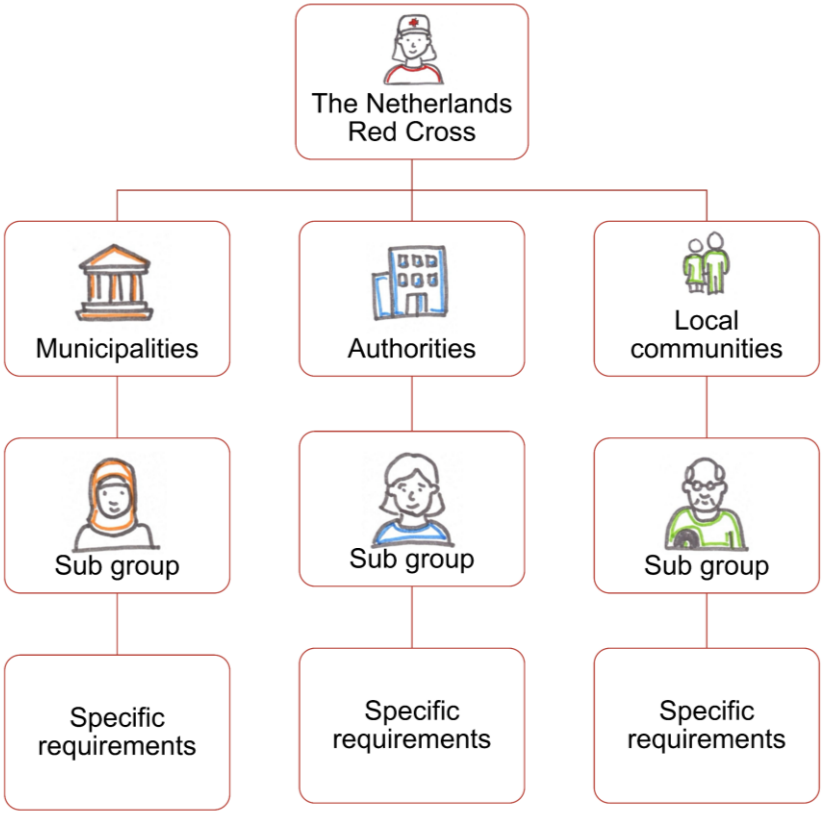


Figure 15: The NLRC reaches people in a vulnerable position through different ways

The NLRC describes in the Strategy 2021 – 2025 (Het Rode Kruis, 2021) the most vulnerable groups as individuals who lack access to basic necessities. These groups include (undocumented) migrants, elderly, people living in poverty and those affected by disasters or conflicts. Focusing on these groups is essential because they are often the first to suffer during crises and the last to receive assistance. By prioritizing aid to the most vulnerable, the NLRC aims to endorse human dignity and ensure that no one is left behind in times of need.

To support these groups, it is important to identify who they are, where they are and what specific needs they have. The NLRC works to map these communities using data, field observations, and collaboration with local partners such as municipalities, healthcare providers, migrant networks and community leaders (Het Nederlandse Rode Kruis, 2021). Reaching these groups requires a low-threshold approach: information should be clear, culturally sensitive and available in multiple languages. These individuals need to be seen, heard and helped in a more direct way, by using visual materials, trusted intermediaries and physical presence in neighbourhoods, for example through community centres or mobile teams. The setting for experiencing, educating and empowering would be in a small group to ensure a safe space.

3.2 Experience

People need to feel related (Ryan & Deci, 2000). They have to start believing that a climate change related disaster can happen to them. They have to experience it, in a relatable and recognizable situation. This paragraph will begin by forming a basic set of requirements for building such experiences and will then explore possible designs for both target groups.

People build on experiences. According to Tversky and Kahneman (1973) people use past experiences to act in situations, by the availability heuristic. However, when there is no past experience, judging how to act is hard. Therefore, you can argue that experiencing a disaster in a pre-set environment might be beneficial. However, emotions during an experience influence how that experience is perceived, remembered and acted upon (Apter, 1984). Desmet et al. (2019) found in their study that people's mood is not static, but moving. The momentary moods shape people's liking to interact with people, environments and objects. Based on Apter's (1984) reversal theory it is important to meet people in the right emotional state and frame the messages in an emotionally intelligent way. If someone is in a telic state and the message triggers anxiety, it may lead to avoidance or even paralysis. If the same message is presented to someone in a playful state, it might provoke curiosity or engagement. According to Desmet et al. (2019) mood awareness is relevant, as person's moods are dynamic, the perceived balance is shaped by the difficulties and motivators a person has recently experienced, is currently experiencing or anticipates encountering in the near future.

The CRF addressed this challenge using a small group or in person approach. Participants were required to make deliberative choices under time pressure. When people think deliberative, they will switch from fast thinking (system one) to slow thinking (system two). According to Wendel (2020) people will rationalize and analyse the situation better when thinking slow. Although the scenario was highly relatable, framing the disaster as a clear projection of the future helped to create a psychological distance. This allowed the participants to encourage reflections without being overwhelmed emotionally. Figure 16 displays quotes from the interview.

"We chose also to design a physical experience, because we think that social bond and social link can only happen if we are all together in the same room."

"We ask the participant to prepare their bag in a hurry so they can't choose everything. That way we create the feeling of emergency and the feeling of stress."

"We are playing in the future. It kind of makes people comfortable with the horrific scenario because it's not now. It's in the future. It's a spirit game. You're just playing with the future, but you're not experiencing it directly."

Figure 16: Quotes from the CRF interview

Design requirements

Based on literature and the interview the experience design should always meet the following requirements:

- Participants must experience a disaster in a relatable scenario.
    - The setting must represent a typical environment for the participant.
    - Settings must be adaptable for different locations.
- The experience must happen in a future scenario.
    - The future scenario needs to create a psychological distance.
- The participants needs to deliberative think about what they experience.
    - The experience must offer choices to the participant.
    - Different choices should have different consequences.
        - Consequences of choices must stay within reasonable causes.
        - The consequences of choices must never lead to the fictional death during the experience.

To start the exploration of potential solutions that meet these requirements, LoFi sketches were created (figure 17). This brainstorming session resulted in six possible solutions, which will be elaborated upon in the following section.

Figure 17: First ideation on experiences

3.2.1 Dutch society

Figure 24 displays possible solutions to let people in the Dutch Society experience a disaster.

Left top – An exhibition
Creating an experience in an exhibition would be a strong solution. It allows for a safe, controlled environment, sets the desired mood, and encourages social interaction among visitors. However, it can be costly, and attracting an audience requires effective communication efforts.

Right top – An augmented reality app
Augmented reality makes the disaster feel personal by placing it in the user's own street. However, it comes with risks: emotional impact, limited social interaction, and the potential for the experience to feel too realistic, which may be perceived negatively.

Left bottom – A movable experience
This solution resembles a mobile exhibition. Visitors enter the truck to experience the disaster in a safe, controlled environment. The truck is mobile and can be transported to various locations for example, NLRC volunteers would be able to use the truck during safety fairs or other activities.

Right bottom – Low-tech game
A low-tech game is cost-effective and easy to distribute, making it accessible for local districts and volunteers. It could be displayed on posters, guiding users through step-by-step choices. This playful, interactive format helps raise awareness about the disaster. However, ensuring relatability may be a challenge.

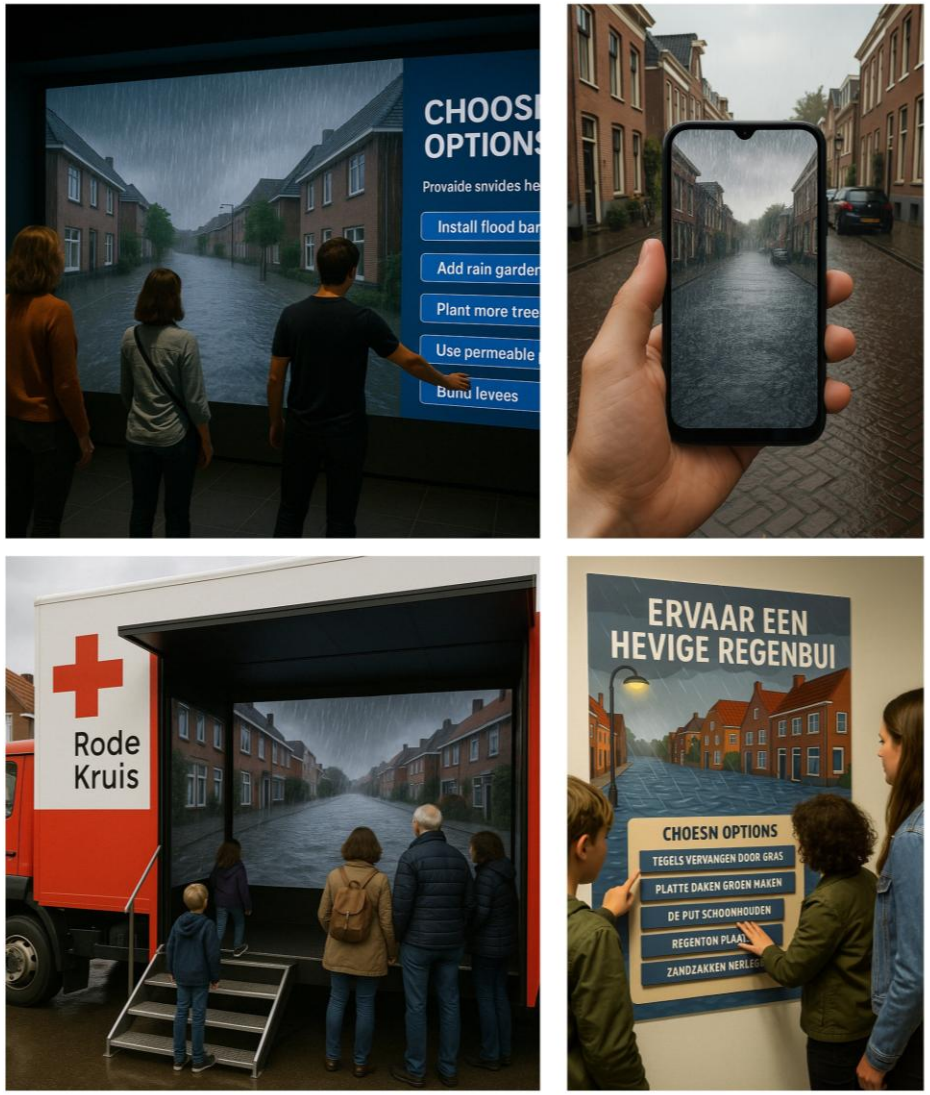


Figure 18: Different ways to let people experience heavy rainfall

3.2.2 People in a vulnerable position

Figure 19: Different solutions for people in vulnerable positions

Individuals in vulnerable positions will be approached more directly. The setting involves in-person interactions or small group sessions, with each group composed of individuals sharing similar characteristics. Therefore, an exhibition or application would not be beneficial.

Top – A (board) game
A game fits a smaller group. While its futuristic theme may seem abstract, role-playing helps participants relate to the scenario. The format is adaptable, easily translatable and encourages interaction. For larger groups, it can be split into smaller teams, each playing on separate boards.

Bottom – Virtual reality glasses
This solution is best suited for smaller groups, as setup takes time. A potential challenge lies in participants' varying levels of digital literacy. Once started, users can fully immerse themselves in the disaster experience. However, it remains important to maintain a futuristic approach. Further research is needed to determine the extent to which a VR experience is perceived as shocking.

Solutions from figure 18 and figure 19 can also be combined into one.

3.3 Educate

People experience a glimpse of their possible future, which helps them relate to the topic on a personal level. However, such experiences can feel overwhelming. According to Ryan and Deci (2000) people need to feel competent in order to motivated and capable of taking action. Therefore, it is essential to complement the experience with education that contextualizes the experience. Providing information about the nature of the disaster, including its risks, likelihood and potential impact, might encourage a sense of competence. This step is important: without understanding, the experience may lead to anxiety instead of empowerment.

International examples can play a key role in reinforcing this sense of competence and connectedness. They show that similar disasters are already happening elsewhere, and people around the world are learning to cope and adapt. Sharing these stories builds a sense of solidarity: you're not alone, and others are already taking action. One quote from a WCE interview captures this well: *"People have to adapt (…) they do not have a choice."*

By showing that adaptation is both possible and already in motion globally, people may think: *"If others can adapt, why can't I?"* This social comparison reinforces the belief that change is achievable and motivates people to take steps themselves.

The CRF guided participants back to the present by contextualizing what they just lived through. They used real-life testimonials from people around the world who already face similar climate-related crises. This helps participants to understand that the futuristic experience is not just fictional, but already a reality. They used this step to turn emotional reactions into informed awareness. Figure 20 displays some quotes from the interview.

"At the end, we return to the present. We ask people: What could you do if you're facing these types of events that are already happening somewhere else in the world?"

"They are using the exhibition as an appetiser to talk about the subject"

"We share testimonials from people who have experienced migratory journeys. They are based on real-life situation and this is where we ask people: What can you do to get prepared?"

Figure 20: Quotes from the CRF interview

Design requirements

The interview and literature form the foundation for requirements for the educational step.

- The experience must include a structured moment that transitions participants from the future scenario back to the present.
    - This transition should clarify that the scenario is based on real-world trends and existing global events.
- Provide clear, accessible information about the causes, likelihood, and potential impact of the featured climate risks.
- Provide knowledge and tools to help participants feel capable of taking action.
    - The content should reinforce that preparation is achievable and worthwhile.
- Integrate international examples or testimonials to show that climate-related crises are already affecting people elsewhere
    - Highlight how others are coping and adapting to encourage a sense of solidarity and shared responsibility.

Figure 21 displays a first-round ideation on how to move from experience to educate. These sketches are used to explore options for the same six ideas from the previous part experience.

Figure 21: First ideation on moving from experience to educate

3.3.1 Dutch society

Figure 28 illustrates various approaches to educating the Dutch public about disasters while promoting a sense of competence.

Left top – An exhibition
Create a symbolic passage between the experience and educational phase. Inform the visitors about the risks and impact of disasters. Use international examples and testimonials. Show how other people around the world adapt to their new situations.

Right top – An augmented reality app
Immediately after the experience, present facts and figures related to what just occurred. Transform the street into a representation of a street elsewhere, and tell the story of that location. What do the residents experience, and how are they coping with their new reality?

Left bottom – A movable experience
Volunteers at the bus should facilitate a transition from the experience to the present-day context. This can be achieved by using tangible examples, through storytelling by the volunteers themselves, to enhance relatability and reinforce key messages.

Right bottom – Low-tech game
After the experiential game, a reflection round follows. Participants are encouraged to consider: *What did I experience? Is this already happening somewhere in the world?* At this stage, international examples are used, as they provide real-world context and help participants connect their experience to current global realities.

Figure 22: Different ways to educate people about heavy rainfall

3.3.2 People in a vulnerable position

Figure 23: Different solutions for people in vulnerable positions

Individuals in vulnerable positions will be approached more directly. The setting involves in-person interactions or small group sessions, with each group composed of individuals sharing similar characteristics. Therefore, an exhibition or application would not be beneficial.

Top – A (board) game
Use the outcomes of the board game as a basis for reflection and further exploration. Then, draw on the knowledge from *Goed Voorbereid* and international examples to provide a broader perspective and to create a feeling that they, too, can take meaningful action.

Bottom – Virtual reality glasses
Building on the experience, an animation can guide participants back to the present. A menu could allow them to choose their own path: do they want to explore the underlying causes, or follow a personal story through the eyes of someone elsewhere in the world? When the simulation takes place in a group setting, with multiple participants using headsets, the volunteer or facilitator can guide the experience by determining the next steps. Use the knowledge from *Goed Voorbereid* and international examples.

Solutions from figure 22 and figure 23 can also be combined into one.

3.4 Empower

People are more likely to take action when they feel a personal connection to a topic and believe they are capable of contributing meaningfully. Creating this sense of competence is essential, but it must be accompanied by clear, actionable steps (Ryan & Deci, 2000). As Ryan and Deci (2000) argue, the feeling of autonomy, having a choice in how to act, is critical to encourage intrinsic motivation. Offering people multiple pathways to engage, such as preparing for a disaster or contributing to working-with-nature, empowers them to take ownership of their response.

Disaster preparedness

Promote the self-assembly of emergency kits. By using the existing checklists participants can be guided to assemble their own kit, based on their specific needs, living situation and risks. This not only increases engagement but also personalizes the preparedness process. It shifts the focus from passive reception to active participation.

Empowerment through working-with-nature

A practical and long-term empowering approach is to encourage working-with-nature, by providing small, tangible actions that individuals can take in their own environment. Examples include greening their gardens, participating in initiatives like tegelwippen (removing pavement to allow for better water absorption), or planting climate-resilient vegetation. These actions are low-threshold, immediately visible, and socially shareable, which reinforces both competence and relatedness (Ryan & Deci, 2000). Moreover, they contribute to larger systemic resilience while strengthening a personal sense of influence.

The role of NLRC as connector

To effectively support the Dutch society in these efforts, the NLRC must adopt a facilitating and coordinating role. It is important to emphasize that the NLRC, for the broader public, should not be seen as a direct provider of preparedness packages or subsidies. Its strength lies in being the connector, offering guidance, clarity, and pathways toward action by connecting citizens with the right local or governmental resources. In doing so, the NLRC can lower the threshold for action and encourage both autonomy and social connection, which are according to Ryan and Deci (2000) two drivers of long-term behavioural change.

The CRF found that experiencing and contextualizing the disasters created awareness and curiosity. Participants were eager to learn what they could do themselves. The CRF offered simple tools like checklists for emergency kits. This demonstrates that people who relate and feel competent are more likely to take action. Figure 24 displays quotes from the interview.

"The insight is that you lived the experience. they are using it to say: OK, I need to get ready."

"This is where we ask people: What could you do if you're facing these types of events that are already happening somewhere else in the world?"

Figure 24: Quotes from the CRF interview

Design requirements

Based on the previous study and the interview, the following design requirements should be met by the empowerment phase.

- The empowerment actions must reinforce confidence and social validation.
    - The actions must be framed positively.
    - Participants must gain self-relevant insights and motivation.
- Participants must be able to reflect on their personal situation.
- Provide clear and realistic examples people can take to prepare.
    - Provide clear follow-up options.
    - The actions must ensure people leave feeling capable, not overwhelmed.
- The NLRC must connect people to local initiatives or governmental subsidies.

Figure 25 shows the potential role of the NLRC to empower the Dutch society, by connecting the people to the different initiatives already existing.

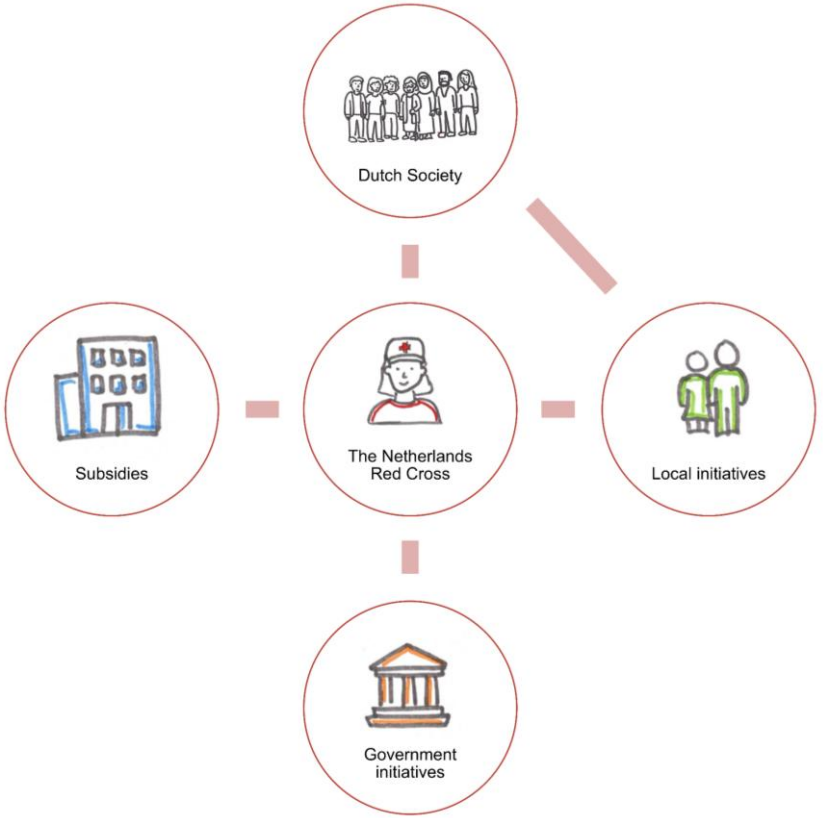


Figure 25: the NLRC as a connector

3.4.1 Dutch society

Figure 32 displays possible ways to empower people to take action.

Left top – An exhibition
After knowing that you can do something, showing clear and realistic actions are presented. Working-with-nature becomes a key player. The NLRC platforms on which people can find initiatives or subsidies for their own situation.

Right top – An augmented reality app
Combining augmented reality and the user's location provides the opportunity to show tailored actions. The actions feel really personal. However, the app needs to display multiple options, as it emphasizes the feeling of autonomy.

Left bottom – A movable experience
The volunteer can combine the educational part with empowering the visitors, by providing clear and simple actions people can take. A computer can help to connect people to local initiatives or subsidies.

Right bottom – Low-tech game
The last part of the game would simulate a new disaster. Participants choose different preventive, mitigation or preparedness measurements. Each action has its own beneficial aspects. This way, people learn what they can do already and how effective it will be.

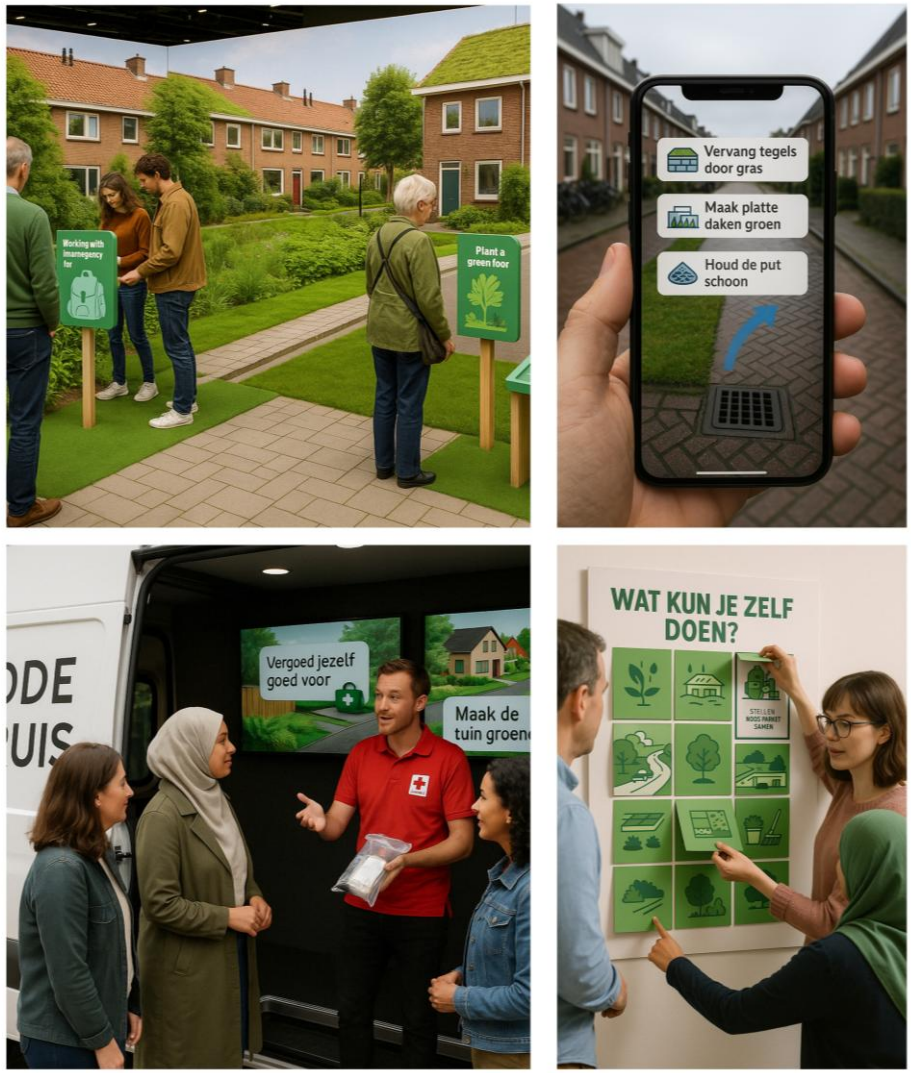


Figure 26: Different ways to empower

3.4.2 People in a vulnerable position

Figure 27: Different solutions for people in vulnerable positions

Individuals in vulnerable positions will be approached more directly. The setting involves in-person interactions or small group sessions, with each group composed of individuals sharing similar characteristics. Therefore, an exhibition or application would not be beneficial.

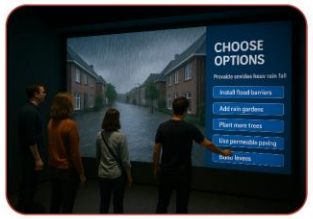
Top – A (board) game
After feeling the experience and educational phase, people receive the necessary resources directly from the NLRC. This may include a checklist, but also tangible items. Knowledge gained from programs such *as Goed Voorbereid* continues to offer significant value in this context.

Bottom – Virtual reality glasses
The VR-environment follows the same approach as the board game. After the experience and international examples, people will receive the necessary resources directly from the NLRC. This may include a checklist, but also tangible items. Knowledge gained from programs such as *Goed Voorbereid* continues to offer significant value in this context.

Solutions from figure 26 and figure 27 can also be combined into one.

Target group

- Identify the audience you wish to reach
- Determine methods and channels to reach them
  - Dutch society – define subgroups
  - People in a vulnerable position – through channels currently used



Experience

- Create a relatable environment
  - Adapt the setting per target group
- Create a psychological distance
  - Place the disaster in the future
- Offer choices
  - Encourage people to think deliberative
- Enhance and embrace social interaction

Educate

- Structure the transition from the experience (future) back to the present
- Provide clear information about the featured climate risks
  - Clarify that the experience is based on real-world events
    - Use the international real-life stories of people affected by similar disasters
- Provide knowledge and tools to help participants feel capable of taking action
  - Show how others are coping and adapting, to encourage a sense of solidarity and shared responsibility

Empower

- Become the connector between the society and government, local initiatives, subsidies
- Make sure that the actions feel capable of acting, not overwhelmed
- Provide realistic and feasible actions
  - Promote the self-assembly of emergency kits
    - *Goed voorbereid*
  - Provide follow-up actions
    - Working-with-nature

Figure 28: *Experience, Educate & Empower – Triple-E framework*

Conclusion

The *Experience, Educate and Empower* framework is an actionable and adaptable tool to enhance climate change disaster preparedness without the disaster occurring. The French Red Cross' Living in 2050 emphasizes that experiencing a future disaster, encourage people seek information and empower them to take action. However, the CRF did not name these steps. Therefore, creating a tool which emphasizes the importance of creating emotional, relatable and safe experiences as a gateway to learning and action is not only beneficial for the NLRC, but also for the Movement as a whole.

By first Experiencing a climate change disaster in the future, participants form an emotional connection and begin to perceive climate risks as personally relevant. However, it is important to create this experience in a safe space, by creating a psychological distance placing the experience in the future.

Following the experience phase, the Educate phase contextualizes the experience, providing knowledge and confidence to understand and act on the future risks. Using international examples and real-life testimonials is key to create a social connection. It outlines the capability of participants. If others can adapt and manage these challenges already, what is stopping me?

This question introduces the last phase Empowering. This phase offers tangible, low-threshold actions. These actions are tailored to each target group, reinforce autonomy, competence and social connection. The NLRC becomes the connector between citizens and options, initiatives or subsidies already existing. For people in a vulnerable position, the NLRC continuous its work with programs such as *Goed Voorbereid*.

The framework offers a flexible approach allowing it to be adapted across various settings, from high-tech and immersive to low-tech and personal. The requirements per phase of the framework can be found in figure 34. First, identify who you want to reach and determine methods or channels to reach them. Build the experience in a relatable, but future oriented way. Use international examples and provide clear information to educate people their capabilities to act. Empower people with concrete simple actions, either short-term preparedness (noodpakket) or long-term prevention (working-with-nature).

The framework seeks to activate people, turning passive awareness into proactive preparedness. By encouraging connection, understanding and creating means, the framework contributes to a more resilient and inclusive society, where everyone, regardless of their background is encouraged and empowered to prepare for the future.

Conclusion & Recommendations

Conclusion

Recommendations

Personal reflection

References

Conclusion

Lessons learned internationally are valuable and relevant for the domestic work of the NLRC, especially in the context of climate change awareness, adaptation and disaster preparedness. However, these lessons cannot be implemented directly to the Dutch context, as they need careful considerations of cultural, social and psychological differences.

Internationally, communities face climate change related disasters with increasing frequency. This frequent occurrence leads people to develop greater awareness and adaptive responses to the changing climate. In contrast, Dutch citizens often do not perceive climate risks as a threat or personal relevant, leading to a lack of proactive behaviour to prepare. This paradox resulted in the story of hope. A story in which people pro-actively choose to prepare before the disaster strikes, based not on fear or threat, but on a positive and empowering vision of the future. The story of hope aims to make the future feel relatable, provide people with knowledge and tools they need (competence) and empowers people to believe that they van and should act (autonomy). It frames climate preparedness not as reactive and fear-driven, but as proactive and hopeful. Emotional connection, psychological readiness and empowerment are crucial for adaptation, especially if a disaster has not occurred.

The story of hope forms the foundation of the Triple-E framework: Experience, Educate & Empower. This framework enables The Netherlands Red Cross to guide citizens from passive awareness to proactive preparedness with a relatable experience, in an educationally enriching and practically empowering way. To encourage a culture of resilience and self-reliance the NLRC needs to let people experience a future disaster in a relatable way, after which the NLRC educates and equipes people immediately with context and actionable tools.

The Triple-E framework is adaptable, inclusive and human-centred. Its adaptability makes the framework scalable across diverse settings and populations. For Dutch society the framework provides a structured way to create awareness and stimulate proactive preparedness by making future risks feel relatable, understandable and actionable. At the same time, it supports people in vulnerable situations by offering the opportunity to create a different design or tool to better correspond to the characteristics of the target group, while keeping the triple-e approach. The framework acts as a tool to come to different solutions for different target groups.

Experience – Make it personal and real

“Hey, that looks like my street.”

People are more likely to act when they feel that something could and might happen to them. By using simulations, storytelling or immersive media people can experience their situation in the future. Making the impact of climate change and climate change related disasters relatable and real. It is important to frame it in the future, as it creates a psychological safety.

Educate – From emotion to understanding

“So, it can happen to me, but it feels so big, what can I do?”

Feeling emotionally connected is the first step, it is the appetizer to make people curious about what they can do. People need to feel competent to act. Contextualize the situation and provide clear and factual information. Translate international lessons and experiences into relatable educational content. Realizing that others have adapted helps create a sense of capability through social proof.

Empower – Make actions possible and attractive

“It is me, I can do something, today!”

Even when people know what the future will be and feel it is important to act, they may still not act unless they believe they can. Creating autonomy is essential, people must feel they have freedom to act. However, where to begin can be difficult. People need a bridge between knowledge and action, a role suited for the NLRC. The NLRC must provide accessible options like checklists for emergency kits, working-with-nature solutions or preparedness programs like *Goed voorbereid*.

In conclusion, the NLRC holds a unique position to connect international insights with national needs. By implementing the Triple-E framework, the NLRC can raise awareness, build emotional and social engagement and empower Dutch citizens to prepare for a future shaped by climate change. This approach does not only enhance domestic resilience, but also strengthens the NLRC’s role as a forward-looking humanitarian organisation.

Recommendations

The recommendations are divided into two parts. The first part will discuss possible studies to improve the framework, the second part will dive into implementation and design solutions using this framework.

Framework

Target group-specific strategies
Identify and determine target groups within the Dutch society. Further research needs to be done on how various demographic groups respond to the experience and what forms of empowerment resonate best. This will help to create an even more adaptable framework to a specific groups.

Effectiveness of the framework
Test and evaluate the framework for the Dutch society. The CRF received positive feedback on their experience, but there might be cultural differences between the Netherlands and France. Testing and evaluating the framework helps to improve and refine the approach.

Psychological distance
There is a change to explore the role of the psychological distance in experiencing the disaster influences the behavioural change to actively prepare. How do different ways of presenting the future disaster (immersive tech versus narrative storytelling) influence people's willingness to act?

Interdepartmental knowledge transfer
Examine what barriers and enablers within the NLRC that influence on how international knowledge can be transferred and operationalized nationally. This knowledge can help to form a better understanding for the educational and empowerment phase of the framework. Facilitate structured knowledge-sharing sessions between NH and IH departments. A cross-departmental climate adaptation task force might be beneficial.

Implementation

Transition of the international lessons

Further research can be done on how specific international practices can be culturally adapted to resonate with Dutch citizens. This study might include communication styles, preferred media formats, local values. In addition to communication, studies can also be done on the working-with-nature approach and what solutions can be translated for the Dutch society or individual citizens.

Use volunteers

Start small, by creating a simple and moveable or printable experience. Train volunteers to facilitate sessions in local communities. When the momentum builds, think of introducing a new type of volunteer, the Green Climate Crosser. Environmentally conscious individuals contributing to a more aware and greener world, acting from within a neutral and independent organisation.

Start with a pilot

Roll out the framework in one district using immersive and relatable scenarios to test the effectiveness of the framework and chosen design. An alternative approach would be to implement the framework in an existing program as *Goed Voorbereid*. The target groups are more specific and knowledge about educating and empowering exists.

Personal reflection

Every project I worked on during my bachelor and master studies was unique, no project was the same. Making mistakes, learning new skills and exploring more than just Delft formed the basis for this project. I had the opportunity to gain 30 ECTS at the Loughborough University in England for my bachelor and 30 master ECTS at Chalmers University of Technology in Sweden.

In the project brief, appendix B, I was asked to state and motivate personal ambitions for my graduation project. I challenged myself to create a social impact on communities through design. During my time aboard in Sweden I completed two courses in marketing and communication. Something I did not learn in Delft, where I learned design skills, by doing, making mistakes, learn from these mistakes and improve. This graduation project offered me the opportunity to combine the knowledge and skills learned in Delft and aboard. Looking back at the project, something I managed to achieve this social impact, not in the form of a mass-produced tangible plastic product, but as a tool, a blue print to encourage people to adapt.

The project

The past six months have felt like a marathon. After my kick-off meeting, I was left with many questions and little idea of where to begin. The NLRC is a complex organisation. Once I started conducting interviews, I began to recognize recurring themes and started to see opportunities for mutual learning. I found my rhythm.

The shift toward a more academic approach, conducting research, went smoothly at first. But as I progressed, I hit a wall. I could not see the way forward. But in a marathon, giving up is not an option. You take a moment to stretch, adjust your pace, and continue. That's exactly what I did. I laid out the puzzle pieces in front of me and gradually started to see the bigger picture. Three key words emerged: you need to experience, educate, and empower. Phase three felt like the final kilometres of a marathon. Your legs are heavy, but the finish line is in sight. After phase two, I was in a good rhythm, and I knew this final loop would give the medal its shine . The framework came to life.

Phase one - The internal analysis

Phase one was new for me. I had to find a golden spot to connect different departments within one organisation. Interviewing individual departments gave me valuable insights in how the organisation works, but having a session with multiple departments attending started the conversations. I started each session by presenting my findings I obtained thus far, which often resulted in long conversations between all attending. I hope my framework will encourage the dialogue and interaction within the organisation, functioning as both a initiator of discussions and a point of reference.

Phase two – Research through Design

Phase two highlights the uniqueness of each project and emphasizes the exploration of design approaches that are new to me. Before this phase, I had never worked with the Research through Design (RtD) method, although I did recognize elements from familiar approaches. This recognition helped me identify a starting point. Typically, RtD requires an artifact, often something tangible. However, I chose my own unique approach. I worked with something intangible, the story of hope. Despite its abstract nature, the story provided me guidelines and tools to start a research process. Through the story and by engaging in research, I developed my framework. I had very limited knowledge of human behaviour. Throughout the research process, I gained greater insight and was able to substantiate why the experiential component is essential in motivating individuals to initiate change.

As part of my research, I was required to conduct empirical fieldwork. Approaching people on the street or ringing doorbells was well outside my comfort zone. I had to step out into the fields. However, I am glad I did. People were incredibly kind and open to about their experiences. I was even invited into their homes, to sit and talk at the kitchen table. I learned that if you approach people with kindness and clearly explain what you're researching and why, they are genuinely willing to help.

Phase three – exploring the framework

Phase three brought me closer to my existing knowledge of design. In this phase, I had a clear starting point. I was able to conduct research to formulate design requirements, and based on these, generate ideas. I applied the more traditional Research for Design (RfD) method here, where research serves to underpin the design process by providing concrete requirements and guidelines. The ideas developed during this phase remain conceptual, but I confidently leave their further elaboration to the Netherlands Red Cross.

Phase three began after I received the green light. My supervisors challenged me to complete a third iteration, allowing me to fully engage with the entire design process, a challenge I accepted. Looking back, it taught me a great deal. This additional loop enabled me to refine my framework and equip it with actionable tools for further application.

Every project is unique, fun, difficult, complex, and at times exhausting. If I were to do it all over again, I would lay out the puzzle earlier and start writing it as a coherent narrative sooner, rather than working in fragments. This would have helped me keep a broader overview and made the wall I hit feel less high. I look back on this unique project with great satisfaction, as this thesis contributes to my personal growth.

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Figure 1

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Figure 8 – houses in Herkenbosch

Figure 9 – entering Herkenbosch

Figure 10 – Valkenburg

Drawings — Van Zee, A. A. T., 2025

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 11

Figure 12

Figure 13

Figure 14

Figure 15

Figure 17

Figure 21

Figure 25

Figures generated by AI	OpenAI. (2023). ChatGPT (GPT-4) [Large language model]. https://chat.openai.com/

Figure 18

Top left promt:	“maak een afbeelding voor een tentoonstelling waarin deze hevige regenbui ervaring plaats vindt, een herkenbare nederlandse straat en mensen staan in de tentoonstelling, het is interactief”
Bottom left promt:	“maak nu een bus/truck, herkenbaar van het Rode Kruis die op de opendag van de brandweer staat, waar mensen ook in een hele herkenbare straat dit kunnen ervaren”
Top right promt:	“ik wil mensen een hevige regenbui laten ervaren, doormiddel van een app. Op de afbeelding zie je een nederlandse straat en een telefoon die naar de straat kijkt, op de telefoon is de straat te zien met hevige regen en ondergelopen”
Bottom right promt:	“maak nu een zelfde ervaring maar heel low-tech, een een soort rollen spel, maak de poster wel in de real life style, en mensen hebben een interactie ermee”

Figure 19

Top promt:	“maak nu een groep die een bord spel/rollen spel spelen en zo de hevige regenbui ervaren, maak de taal zowel Nederlands, als Engels en Arabisch en maak de groep inclusiever”
Bottom promt:	“Maak nu een kleine groep die deze regenbui ervaren doormiddel van een VR-bril”

Figure 22

Top left promt:	“Hi chat, kan je die tentoonstelling deel 2 maken, hier krijgen mensen uitleg over de hevige bui en ook internationale voorbeelden, het gaat er om dat mensen leren wat er gebeurd en dat ze hetgevoel krijgen dat ze competent zijn om iets te doen”
Bottom left promt:	“maak nu een zelfde informatie, maar dan voor de truck (zet er bijvoorbeeld een rode kruis vrijwilliger bij die uit leg geeft)”
Top right promt:	“maak nu die zelfde app, ipv de ramp laat het nu informatie zien, waarom gebeurd dit? waar moet ik zelf op letten? het geeft uitleg over wat ik zie en ervaar (onderwijzen)”
Bottom right promt:	“maak nu een tweede poster voor uitleg”

Figure 23

Top promt:	“maak het zelfde voor het bord spel, na het spel krijgen mensen uitleg over wat ze net hebben meegemaakt”
Bottom promt:	“maak nu een zelfde afbeelding voor de vr bril, waar een kleine groep mensen over de gevaren leren, (afbeelding landscape)”

Figure 26

Top left promt:	“maak een tentoonstellingsruimte voor deel 3, hier krijgen mensen empowerment, ze leren wat ze zelf kunnen doen en waar ze terecht kunnen. met duidelijke working-with-nature voorbeelden, denk aan de straat groen maken, tegelswippen.”
Bottom left promt:	“maak het nu voor de bus, de vrijwilliger laat voorbeelden zien wat mensen thuis al kunnen doen, een noodpakket. de schermen geven aan dat de tuin groener maken handig is.”
Top right promt:	“maak de afbeelding van de app in de straat, maar nu staan er concrete dingen die je kan doen (tegels vervangen door gras, platte daken groen maken, de put schoon houden)”
Bottom right promt:	“maak het nu voor het poster spel, mensen kunnen vakjes omvouwen en zo de maatregel zien, maak het visueel aantrekkelijk, maak de afbeelding verticaal. Hang hem aan de muur en laat mensen er mee interacten”

Figure 27

Top promt:	“maak nu deze afbeelding maar dan voor de bordspel groep, de vrijwilliger deelt hier concrete pakketen uit en checkt deze met mensen”
Bottom promt:	“maak nu de laatste afbeelding voor de VR bril groep, ook hier zien ze empowerment stappen, concrete voorbeelden wat ze nu al kunnen, ook dit faciliteert het RK”
Figure 13	Images same as bottom left figure 18, bottom left figure 22 and bottom left figure 26
Figure 28	Images same as top left figure 18, top left figure 22 and top left figure 26

Appendices

Appendix A	Interviews Herkenbosch and Valkenburg
Appendix B	Project brief

Appendix A – interviews Herkenbosch and Valkenburg

Herkenbosch

Did not want to participate reactions:

- It happened, I don't want to talk about it anymore
- It had a very bad influence on me personally, I don't want to participate, but try over there (points at house)
- I was on holiday
- I don't want to think about it again, maybe try someone else

Evacuation Process:

- Warnings often came through neighbours or friends, rather than through official channels.
    - Now – I will check the site of the municipality more often to see if there is danger
- The evacuation itself proceeded calmly, without panic or chaos.
- Most residents chose to stay with family or friends, rather than using the official emergency shelters that had been set up.
    - 'I stayed at my son's house, he lives nearby luckily'
- After two to three days, residents were allowed to return to their homes.
- The fire was not directly visible from the village, but smoke and air quality concerns were the main reasons for evacuation.

Experiences:

The evacuation was seen as reasonable and carefully managed, even though the fire never directly threatened the houses in the village.

- Communication from the municipality was cautious but sufficient.
- At the time, very few residents were prepared with emergency supplies or "go-bags".
- The wind was blowing towards the town, it was different than we are used to have. I took the message very serious (90+ years old now, then late 80s)

Current Attitudes:

Although most residents still do not have a full emergency kit, awareness has increased:

- Some now keep basic supplies like water, medication, flashlights, and batteries on hand.
- However, a pragmatic attitude remains common: "If it happens again, I'll just grab a few things and go."

Experiences with Past Disasters

Earthquake of 1992:

- Described as more impactful than the wildfire
- Despite the experience, it did not cause more fear during later incidents like the wildfire.

Awareness and Climate Change

There is a growing sense among residents that extreme weather events are becoming more common and more intense:

- Concerns were voiced about the increasing risk of wildfires and flooding.
- Climate change is acknowledged as a contributing factor, with comparisons drawn to events in Spain, Italy, and Los Angeles.

Valkenburg

Initial Experience

- Sudden flood warnings received via phone and social media.
- Evacuation to higher areas with family cars.
- Witnessed water rising rapidly in the area.

Emotional Impact

- Panic and fear, especially seeing friends' homes flood.
- Lingering trauma, anxiety during heavy rain or rising river levels.
- Feelings of helplessness during the event.

Preparedness

- No personal emergency kits or structural modifications in place.
- Belief that floods are too fast to fully prepare for.
- Some supplies like food are kept, but no specific flood measures taken.

Community Response

- Strong mutual support among villagers.
- Joint cleanup efforts after the flood.

Role of Emergency Services

- Sandbags provided by fire department, but often too late.
- Efforts were overwhelmed by the speed and volume of the water.

Communication and Information

- Reliance on Facebook and local group chats for real-time updates.
- No official early warning system mentioned beyond initial phone alert.
- Community maintains close contact for future risk monitoring.

Aftermath and Recovery

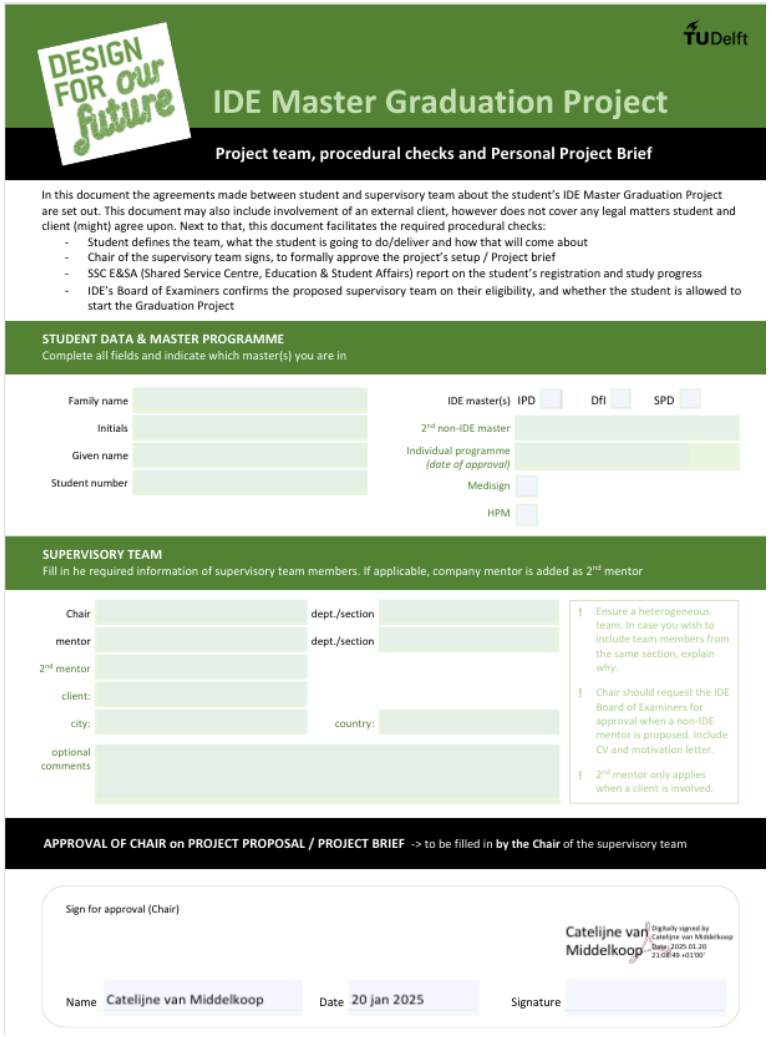
- Focused on removing water and drying homes/restaurants.
- Long recovery due to sponge-like marl construction materials.
- Ongoing use of dehumidifiers even long after the event.

Future Outlook

Acknowledgement of the likelihood of future floods.

- No major preventative action taken since.
- Increased awareness and quicker response anticipated, but structural readiness remains low.

Appendix C – Project brief



DESIGN FOR our future

TU Delft

IDE Master Graduation Project

Project team, procedural checks and Personal Project Brief

In this document the agreements made between student and supervisory team about the student's IDE Master Graduation Project are set out. This document may also include involvement of an external client, however does not cover any legal matters student and client (might) agree upon. Next to that, this document facilitates the required procedural checks:

- Student defines the team, what the student is going to do/deliver and how that will come about
- Chair of the supervisory team signs, to formally approve the project's setup / Project brief
- SSC E&SA (Shared Service Centre, Education & Student Affairs) report on the student's registration and study progress
- IDE's Board of Examiners confirms the proposed supervisory team on their eligibility, and whether the student is allowed to start the Graduation Project

STUDENT DATA & MASTER PROGRAMME
Complete all fields and indicate which master(s) you are in

Family name
Initials
Given name
Student number

IDE master(s) IPD Dfl SPD
2nd non-IDE master
Individual programme *(date of approval)*
Medisign
HPM

SUPERVISORY TEAM
Fill in he required information of supervisory team members. If applicable, company mentor is added as 2nd mentor

Chair dept./section
mentor dept./section
2nd mentor
client:
city: country:
optional comments

! Ensure a heterogeneous team. In case you wish to include team members from the same section, explain why.
! Chair should request the IDE Board of Examiners for approval when a non-IDE mentor is proposed. Include CV and motivation letter.
! 2nd mentor only applies when a client is involved.

APPROVAL OF CHAIR on PROJECT PROPOSAL / PROJECT BRIEF -> to be filled in **by the Chair** of the supervisory team

Sign for approval (Chair)

Catelijne van Middelkoop

Name Catelijne van Middelkoop Date 20 jan 2025 Signature

CHECK ON STUDY PROGRESS
To be filled in **by SSC E&SA** (Shared Service Centre, Education & Student Affairs), after approval of the project brief by the chair.
The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total EC
Of which, taking conditional requirements into account, can be part of the exam programme EC

	YES	all 1st year master courses passed
	NO	missing 1st year courses

Comments:

Sign for approval (SSC E&SA)

L. Boot

Name Lisette Boot Date 20 jan 2025 Signature

APPROVAL OF BOARD OF EXAMINERS IDE on SUPERVISORY TEAM -> to be checked and filled in by IDE's Board of Examiners

Does the composition of the Supervisory Team comply with regulations?

YES	★	Supervisory Team approved
NO		Supervisory Team not approved

Comments:

Based on study progress, students is ...

★	**ALLOWED** to start the graduation project
	NOT allowed to start the graduation project

Comments:

Sign for approval (BoEx)

Monique von Morgen

Name Monique von Morgen Date 28 Jan 2025 Signature

DESIGN FOR our future

TU Delft

Personal Project Brief – IDE Master Graduation Project

Name student | **Student number**

PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT
Complete all fields, keep information clear, specific and concise

Project title Too Much, Too Little, Poor Quality: A Solution for Water Issues in the Netherlands

Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

Introduction

Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)

The Netherlands Red Cross (NLRC) has expertise in water management and emergency aid, with a primary focus on Nature-Based Solutions (NBS). Operating in the humanitarian and environmental domains, the NLRC supports projects in collaboration with local communities both domestically and internationally to address critical water-related challenges.

These challenges include too much water (flooding), too little water (drought), and poor water quality. The NLRC specializes in emergency response, such as aiding communities during floods in Limburg or the Philippines, and in heatwave prevention, exemplified by projects like Limitless. Moving forward, the organization aims to adopt a more preventive approach to water-related issues, strengthening community resilience before crises occur. Effective communication about their efforts is key to achieving this preventive role.

The success of these initiatives lies in cross-sector collaboration, involving local communities, international experts, and government bodies. By integrating local knowledge, international expertise, and governmental support, the NLRC ensures that the solutions are sustainable, scalable, and tailored to community needs.

Key stakeholders include the NLRC, international Red Cross partners, local governments, and the communities they serve. Together, they work to implement Nature-Based Solutions that not only tackle immediate water emergencies but also build long-term resilience.

This project fits within the Human communication and information domain.

→ *space available for images / figures on next page*

DESIGN FOR our future

TU Delft

Personal Project Brief – IDE Master Graduation Project

Problem Definition

What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice.
(max 200 words)

The Netherlands Red Cross (NLRC) is engaged in various Nature-Based Solutions (NBS) projects worldwide, yet it currently lacks a comprehensive overview of its ongoing and completed initiatives. This absence of clarity hinders communication among colleagues and limits opportunities for collaboration. This research seeks to establish a framework that supports the development of design proposals.

Mapping NLRC Projects and investigating thier internal communication (50 days +-):
The first step is to create a detailed overview of all NLRC projects related to NBS. This involves mapping these initiatives and contextualizing them within broader water management strategies.
What are the main objectives and outcomes of each project? What valuable lessons can be drawn from these initiatives? - Mapping the internal communication between international, national, m&f & communication.

Communication Strategy (50 days +-):
Once the projects are mapped, the next challenge is to effectively communicate NLRC's initiatives to Dutch citizenssponsors, and other stakeholders.
Developing clear, engaging messages that highlights the benefits and impacts of NBS projects

Assignment

This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence)
As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the green text format:

Design/Investigate/Validate/Create) a (what will be the deliverable -> prototype/ roadmap/process/ intervention/approach/ guideline/strategy/...) to (what should it do -> create/ understand/evaluate/validate/improve/execute/analyse/...)
(the objective -> experience/ value/process/product/...) for (whom -> target group/ client/...) in (what context).

Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)

Objective:
Design a product that addresses water-related challenges in the Netherlands, focusing on Nature-Based Solutions (NBS), international cooperation, and community connectivity, by identifing how lessons learned from our international context could potentially be translated to our work domestically, and how NLRC promote and raise awareness (both on internally and externally) on Nature-based Solutions and ecosystem based adaptation.
Scope of Research:
Given the broad nature of this assignment, the design can begin with one of three core areas: excess water (flooding), insufficient water (drought), or poor water quality. The proposed solution should be applicable within the Dutch context, enhancing urban resilience and sustainability.

This design proposal aims to integrate NBS into the urban landscape of the Netherlands, fostering awareness, collaboration, and community engagement. By addressing water-related challenges through innovative and sustainable solutions, we can enhance the resilience of Dutch cities and create a sense of connection among residents.

Project planning and key moments

*To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a **kick-off meeting**, **mid-term evaluation meeting**, **green light meeting** and **graduation ceremony**. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).*

Make sure to attach the full plan to this project brief.
The four key moment dates must be filled in below

Kick off meeting	13 Nov 2024
Mid-term evaluation	
Green light meeting	
Graduation ceremony	2 May 2025

In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project

Part of project scheduled part-time	
For how many project weeks	
Number of project days per week	

Comments:

Motivation and personal ambitions

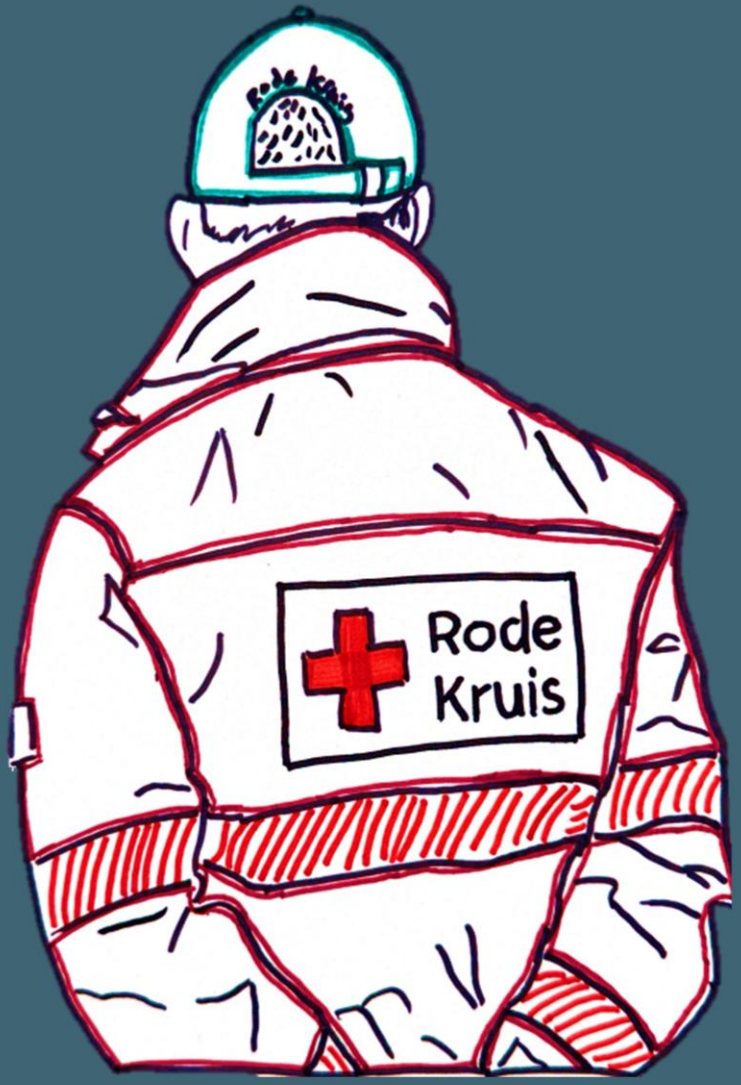
Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five.
(200 words max)

Industrial Design is not only about creating products that can be mass-produced. We, as designers, are creatives who can broaden one's perspective and provide different views on projects and processes. The project for the NLRC tests this skill set, especially during the initial research phase.

For my master electives, I went to Sweden, where I completed two courses in marketing and communication. Communication through design inspires me. This project combines the design skills I learned during IPD and the communication skills I acquired in Sweden—something I aspire to bring into practice.

I want to learn how to create a social impact on communities through design. I met the NLRC during the final of the HEMA design contest in 2022, where an employee of the NLRC and I both participated. She invited me to do my graduation project at the NLRC. Since then, it has always stayed in my mind. I believe the NLRC is an organization that strives to make a social impact through design.



Master thesis
Aldo van Zee

MSc Integrated Product Design
Faculty of Industrial Design Engineering
Delft University of Technology

Delft University of Technology
Catelijne van Middelkoop – Chair
Natassia Jacobs – Mentor

Het Nederlandse Rode Kruis
Joey de Hamer
Michel Becks

Rode Kruis

TU Delft