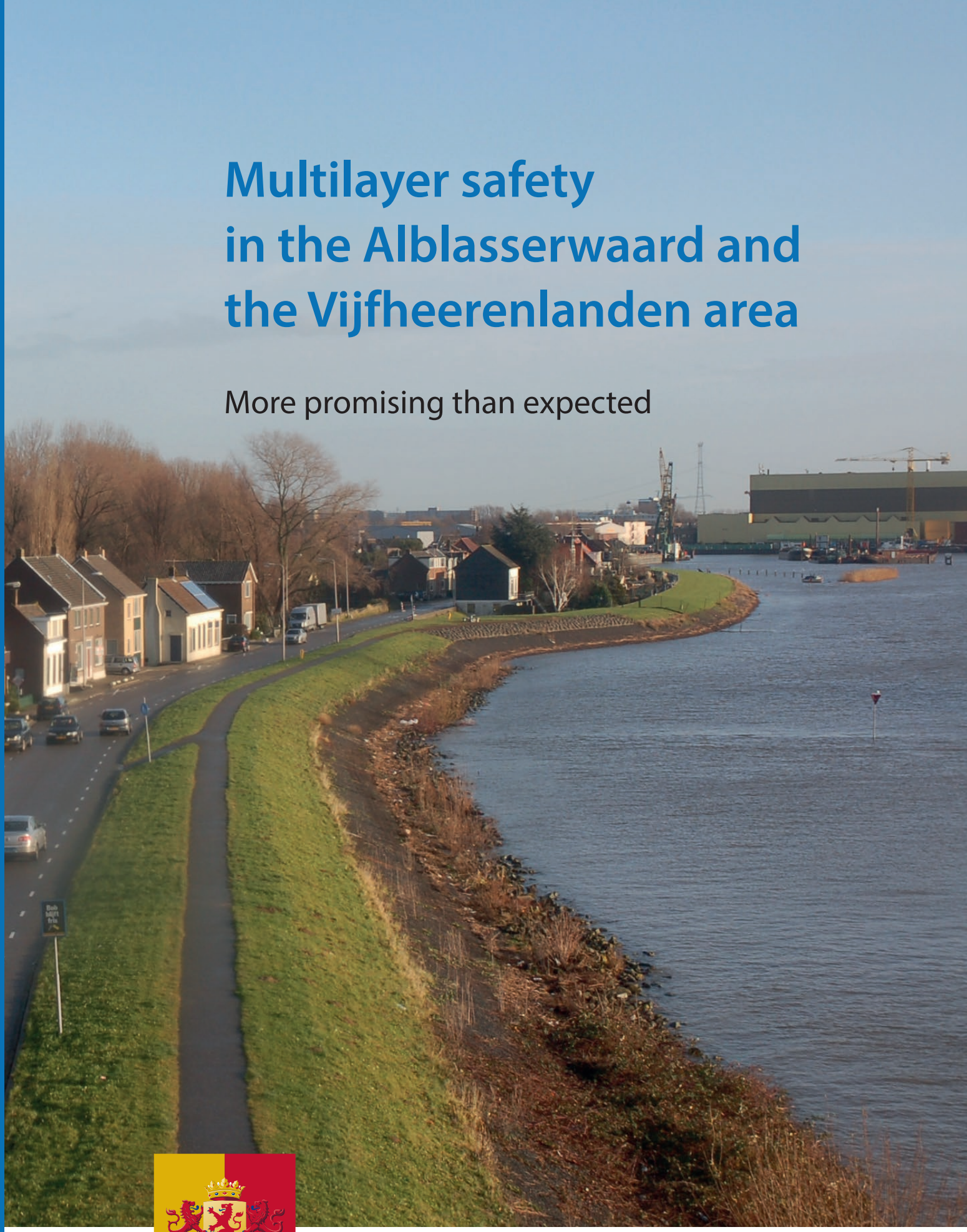
Multilayer safety in the Alblasserwaard and the Vijfheerenlanden area

More promising than expected



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0 Introductory summary

FRAMES study of the neglected opportunities offered by MLS

This publication bundles the results of the FRAMES study into Multilayer Safety (MLS) in the Alblasserwaard and the Vijfheerenlanden (A5H) area together with a translation of these results into general policy recommendations. The report is therefore of interest to all those currently involved, or interested, in MLS: the province of South Holland, stakeholders in the region (municipalities, water boards, Rijkswaterstaat and the Safety Regions), national stakeholders and international partners.

MLS is a promising concept in which different parties work together coherently to improve water safety. It is based on a risk assessment approach which includes consideration of the likelihood of flooding as well as its consequences. The concept demonstrates that water safety is not simply a question of prevention, but that spatial planning and effective crisis management can also make important contributions. This is why provincial policy – the Omgevingsvisie ('Regional Environmental Vision') – includes the MLS concept as the foundation of its water safety policy.

Working with MLS in practice has, however, been less fruitful. A strong focus on prevention (Layer 1) has meant that spatial planning, crisis management and recovery (Layers 2, 3 and 4) have remained somewhat neglected topics. Many executive bodies in the area have been convinced that these layers offered little additional value.

This means that opportunities have been missed. Our dikes may be robust, but we need a Plan B in case things should ever go wrong. Adopting appropriate measures in the various layers can both reduce the risk of flooding and reduce the number of victims and the amount of damage that flooding causes.

More research was needed, and in 2016 a perfect opportunity to do so appeared. The province of South Holland was able to participate in a European study (FRAMES, see box) into the application of MLS and what this meant for policy. In the Alblasserwaard and the Vijfheerenlanden area the province is already working with the municipalities and Water Board within the Gebiedsraad A5H (A5H Area Council) in order to link water and water safety to spatial development. The province therefore selected this area as a pilot area for FRAMES.

What is FRAMES?

FRAMES (Flood Resilient Areas by Multi LayEred Safety) is a European project whose aim is to improve the flood resilience of areas, communities and authorities by applying the concept of multilayer safety. Partners from the Netherlands, Belgium, Germany, Denmark and the UK are working on pilot projects in fifteen areas (see map). The province of South Holland has selected the Alblasserwaard and the Vijfheerenlanden area for one of these pilots.

FRAMES gives its partners an opportunity to examine how they could apply the concept of MLS and what this would mean for policy. Policy recommendations are delivered at the end of the project. FRAMES is part of the European INTERREG North Sea Region, a transnational programme to promote cooperation between a variety of parties in different countries around the North Sea. The province of South Holland is part of this North Sea Region. The programme is funded by the partners and the EU.

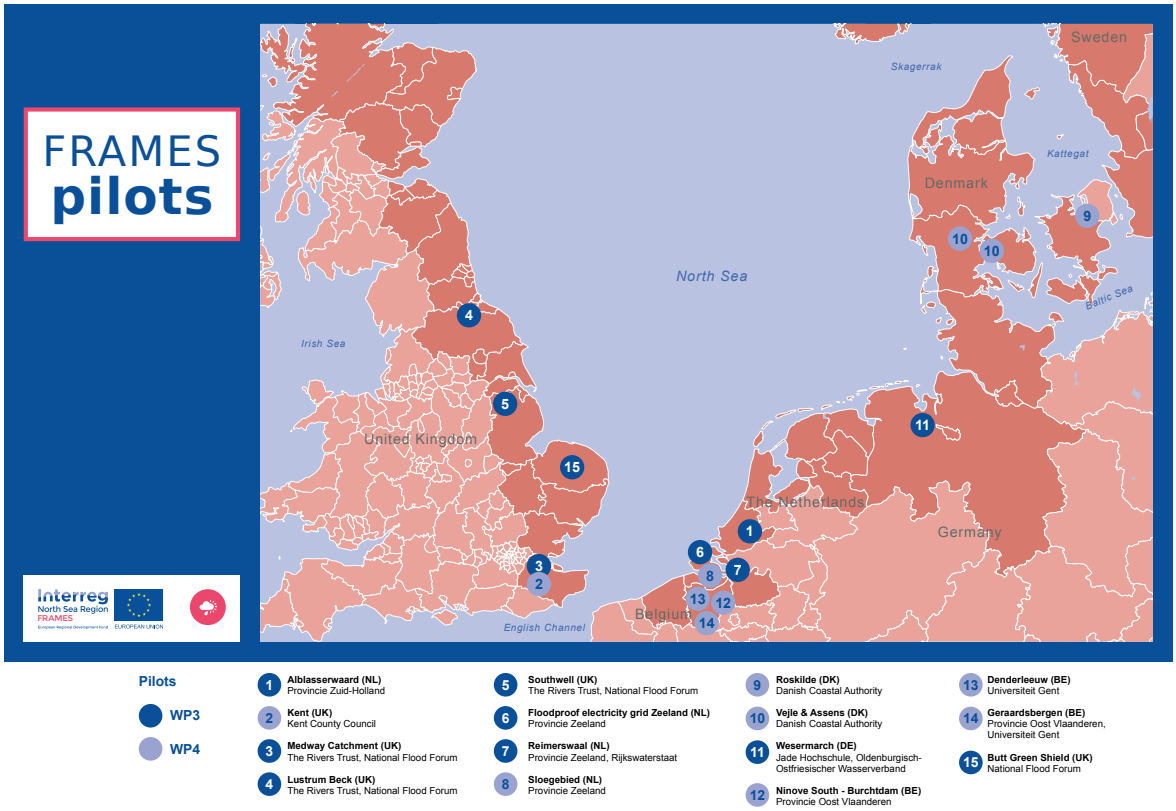


Figure 1: FRAMES pilot areas.

A number of separate research projects were carried out within FRAMES: a literature review, an expert session and research into the community capacity for spontaneous assistance ('Helping Hands'). The literature review yielded a clear definition and a shared picture of MLS. The expert session revealed how spatial planning (Layer 2) can assist evacuation and crisis management (Layer 3), namely by promoting traffic control and exploiting differences in elevation. The principal results of both these research studies have already been cited in the 2018 Perspectievennota A5H ('A5H Perspectives Memorandum'). More recently, the 'Helping Hands' study yielded guiding principles for steering and channelling community capacity, as well as some practical recommendations.

Experiences were also exchanged with the other European participants. The results, conclusions and recommendations of all the FRAMES studies were discussed with stakeholders, experts and the other FRAMES partners, and finally translated into the following policy recommendations:

- Make MLS a shared task.
- Exploit moments of synergy (linking opportunities).
- Approach financing as a collective responsibility.
- Be open to help from unexpected sources.
- Continue investing in water awareness.
- Align decisions and activities at the area level.

The thread running through all this advice is therefore 'look beyond your own layer'. The region is now in a position to use this policy advice to start making MLS a reality. Authorities in the area can continue to work closely together; through the Rijnmond-Drechtsteden Delta Programme, the results can be disseminated more widely; and the province can play an important linking role in scaling up the results.

Document structure

Chapter 1 briefly examines the background of the area itself, administrative cooperation and the concept of MLS. Chapter 2 describes the FRAMES study: its problem definition, aims, scope and approach. Chapter 3 describes its conclusions and recommendations, and Chapter 4 details its policy recommendations. Chapter 5 looks at the next steps to be taken, and closes with a reflection by FRAMES project leader Lucy Smeets.

1 Background

This chapter sketches the characteristics of the Alblasserwaard and the Vijfheerenlanden area, looks at administrative collaboration in this area and gives a definition of the concept of multilayer safety

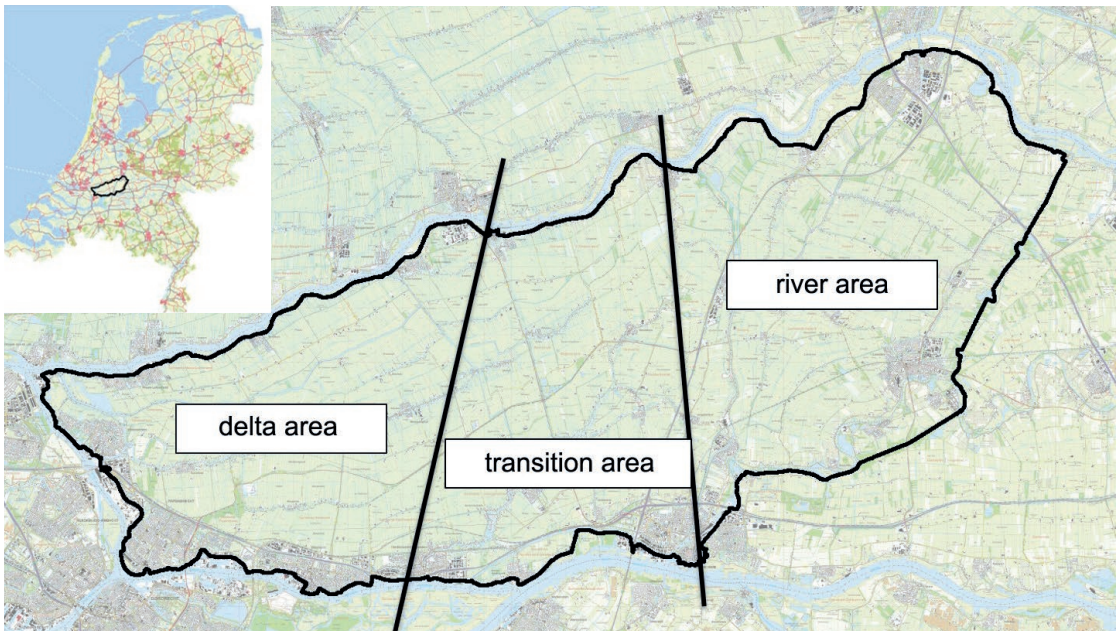
1.1 The Alblasserwaard and the Vijfheerenlanden area: a vulnerable area

The Alblasserwaard and the Vijfheerenlanden (A5H) area lies in the Rhine-Maas delta. Before dikes were constructed in the 13th century this area was strongly influenced by these large rivers, with regular flooding as a result. The dikes put an end to this flooding, but dikes do not offer a 100% guarantee of protection. The risk of flooding in this area remains high because it is vulnerable to both sea and river water levels.

Extremely high water levels in the Rhine could break through a dike – a risk that is highest at the area's eastern border. At the western end of the Alblasserwaard, sea levels affect water levels. A storm at sea could push water levels up so high that the western dikes might fail.

The area is also vulnerable because of its elevation level contours in relation to NAP (see Figure 3). The A5H is a kind of bathtub surrounded by rivers (the Lek, Noord and Merwede). In the event of flooding, the area would quickly be inundated to a considerable depth.

Figure 2: The location of the pilot area in the Netherlands, and its division into flood risk areas.



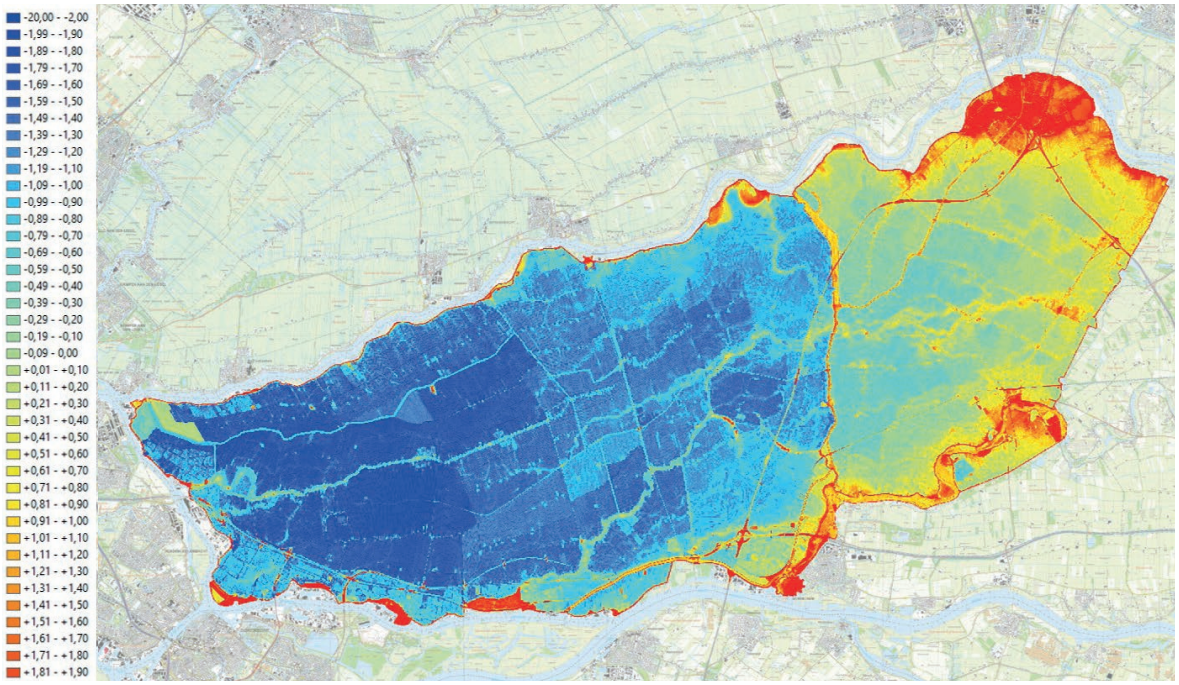


Figure 3: A5H ground levels in relation to Amsterdam Ordnance Datum.

1.2 Administrative collaboration in A5H and existing attention for MLS

By no later than 2050, dikes in the Netherlands will have to meet stricter standards. For the Alblasserwaard and the Vijfheerenlanden area this will be a complex undertaking. The raising and/or widening of dikes has a profound influence on the residential, working and living environments of the inhabitants and companies in this area. For this reason, in 2014 national and regional authorities initiated an 'area process' aimed at improving the mutual coherence of water safety measures and other projects in the area. A MIRT study (Meerjarenprogramma Infrastructuur, Ruimte en Transport) (Long-term Infrastructure, Spatial and Transport Programme) was carried out to this end. The Gebiedsraad A5H (A5H Area Council) was set up to supervise the study; this council comprised representatives of the Ministry of Infrastructure and Environment, the province of South Holland, the municipalities in the area, the Rivierenland water board and Rijkswaterstaat.

In 2016 the Area Council presented a final MIRT report, entitled Volop verbindingen tussen water en ruimte ('Plenty of links between water and space'), a report which still left the issue of multilayer safety comparatively neglected. The Area Council then started taking action based on the conclusions of this report, including launching the Water en Ruimte Verbinden ('Linking Water and Space') programme. In 2018 the results were bundled in the Perspectievennota A5H ('A5H Perspectives Memorandum'). Multilayer safety is mentioned in this memorandum, which contains the first conclusions from the FRAMES study, as this was already underway at that time.

1.3 A closer look at multilayer safety

Multilayer safety takes a risk-based approach which includes consideration both of the likelihood of flooding and of its consequences. The first principle of MLS is that water safety is not just a question of prevention (the first layer), but that spatial planning can limit the consequences of flooding (the second layer) and that effective crisis management (the third layer) can limit the number of victims and the amount of damage caused. A fourth layer is now also

under consideration: that of recovery and rebuilding after the event.

MLS was introduced in the National Water Plan in 2009 as a concept for a sustainable water safety policy on flooding in the main water system. The concept was incorporated into the Delta Programme and the National Water Plan 2 (2016–2021). In provincial policy, laid down in the Omgevingsvisie ('Regional Environmental Vision'), MLS forms the foundation of water safety policy.

Thus far, work in the Netherlands has concentrated on limiting the likelihood of flooding by strengthening dikes (prevention, Layer 1). Using spatial planning to limit the damage caused by flooding (Layer 2) has been given little attention. Crisis management (Layer 3) has been adopted by the Safety Regions.

Facilitating recovery work in the wake of flooding (Layer 4) has so far received no attention at all.

Responsibility for these layers has come to lie with different authorities. Layer 1 is the domain of Rijkswaterstaat (the Department of Waterways and Public Works) and the water boards, Layer 2 lies with the provinces and municipalities, Layer 3 lies with the Safety Regions and municipalities, and Layer 4 (recovery) is a general responsibility. Collaboration between these various authorities is therefore a prerequisite for MLS.

In the Netherlands, MLS is focused on flooding from the main water system. Other European countries (and therefore also the FRAMES pilots in those countries) have also applied the concept to flooding from heavy rainfall.

Table 1: Definition of multilayer safety and examples of measures in each layer.

Layer	Examples of measures
 **Layer 1 - Prevention** Measures that attempt to reduce the likelihood of flooding to a certain level.	• Dike reinforcement • River widening • Coastal defences • Storm surge barriers
 **Layer 2 - Spatial planning** Also known as 'water-robust' planning. Limiting the consequences of flooding through spatial planning in vulnerable areas.	• Measures taken to protect vulnerable and vital infrastructure such as electricity, the gas network and drinking water supply • Evacuation routes in spatial planning • Shelter locations in spatial planning
 **Layer 3 - Crisis management** Measures that raise awareness (in the 'cold' preparatory phase) and facilitate crisis management before and during flooding (horizontal and/or vertical evacuation).	• Raising awareness of flood risks in the area and on escape routes • Engaging self-reliance
 **Layer 4 - Herstel** Measures that contribute towards rapid recovery after a flood.	• Facilitating disaster recovery in existing vulnerable and vital infrastructure • Facilitating disaster recovery in project plans (housing, roads, companies, etc.)

Summary of the definition of multilayer safety; the complete overview of all measures and research studies can be found in the Literatuuronderzoek Meerlaagsveiligheid A5H ('A5H Literature Review of Multilayer Safety'), Procap 2017.

2 The FRAMES study: three research projects and policy recommendations

This chapter covers the problem definition, aims, scope and approach of the FRAMES study of multilayer safety in the Alblasserwaard and the Vijfheerenlanden area.

2.1 Problem definition: a strong focus on prevention

The Alblasserwaard and the Vijfheerenlanden area is particularly vulnerable to flooding, as described in Chapter 1. This has given the area a strong focus on prevention. The safety standards for the dikes surrounding this area are high. This has reduced the likelihood of flooding, but should the dikes ever fail, the consequences would be very serious because the area would be rapidly flooded to a considerable depth. About 200,000 people live in the area, as well a great many cows, sheep, horses, chickens, etc. The time available in which to decide on evacuation is short: in the event of imminent seawater flooding from a storm surge this is one or two days, and in the event of imminent river water flooding this is still only three or four days. The evacuation options in the area are limited; there are only a few roads that lead out of the area. Vertical evacuation options (more elevated locations, e.g. higher ground or tall buildings) in the area are also limited, and represent a solution only to a small part of the population. It is therefore important to give attention to the other safety layers, should anything go wrong.

2.2 Aims: bringing MLS a step closer

The aim of the FRAMES study in the A5H was to examine the opportunities for multilayer safety and to formulate broadly applicable policy recommendations in order to bring the MLS concept a step closer.

2.3 Scope: Ring Dike 16, trans-provincial

The FRAMES study in the A5H focused on Ring Dike 16. This dike ring crosses different provinces; part of the area (the Vijfheerenlanden municipality) lies in the province of Utrecht, and a very small part (the municipality of Lingewaal) lies in the province of Gelderland. The study examined the area as a whole, as floods do not respect administrative borders. The study examined the situation of flooding from the main water system, and did not look into pluvial flooding, as was done in other countries.

The province of Utrecht is doing its own research into limiting the consequences of flooding. This research is in line with the FRAMES study, and the knowledge, experience and outcomes arising from the two studies are being exchanged.

2.4 The approach

Together with the stakeholders of the A5H we examined where there were opportunities to improve safety in the area and to reduce the damage caused by flooding. This was done by means of a literature review, an expert session and a research study into the community capacity for spontaneous help during a flood. Policy recommendations were then drawn up on the basis of the results of these studies and exchanges of knowledge.

Literature review: what do we already know?
At the beginning of the study the stakeholders in the area had the idea that much was already known

about MLS, and did not expect the concept to add much to water safety strategy in the area. However, an overall picture of existing studies on the subject was absent, so a literature review was conducted. Key questions were: 'what do we already know about MLS measures in the Alblasserwaard and the Vijfheerenlanden area' and 'what are the starting points for further research?'

Expert session: how can spatial planning improve evacuation?

The literature review showed that spatial planning measures (Layer 2) in relation to crisis management (Layer 3) had been comparatively under-researched. Stakeholders indicated that opportunities may therefore have been missed. An expert session was accordingly held in order to examine how spatial planning measures could improve evacuation.

Community capacity: how can it be steered in the right direction?

The Safety Region of South Holland South needed a study of the community capacity for spontaneous help. A flood is a large-scale disaster that the government cannot deal with alone. How can best use be made of the assistance invariably volunteered by society? And how can this help be steered in the right direction? The 'Helping Hands' study was carried out in order to answer these questions.

International knowledge exchange and the translation to policy recommendations

The outcomes of the three studies were discussed in meetings with officials and administrators. The project leader also attended FRAMES meetings held by several partners abroad. The knowledge and experience gained in these meetings was shared with the stakeholders and incorporated into the research results. In early 2019 a German delegation from the Jade Hochschule in Oldenburg paid a visit to the Alblasserwaard and the Vijfheerenlanden area. Both partners exchanged knowledge during a field visit and a meeting.

All the results of the studies and knowledge exchanges were finally translated into broadly applicable policy recommendations for the stakeholders in the A5H, the province of South Holland, national stakeholders and international partners..

"The German Red Cross is very interested in the research into community capacity"

"Our visit to the Alblasserwaard and the Vijfheerenlanden area was an interesting experience," reported the project leader of the FRAMES pilot in the Wesermarsch (Germany). "Together with the stakeholders from our area, in February 2019 we paid a visit to the Alblasserwaard. Many of the dilemmas there resemble our own. Evacuation is a challenge for us, too, and there are few opportunities to take spatial planning measures. We were surprised, however, by the area's multifunctional dikes. In the Wesermarsch we have almost no buildings on the dike, as this makes dike reinforcement work much simpler. And the German Red Cross is very interested in the research into community capacity. They think that the outcomes of this research could also be of use to them.

3 Conclusions and recommendations: multilayer safety offers unexpected potential

This chapter describes this study's principal conclusions and results; the detailed findings are in the original reports *. The overall conclusion is that multilayer safety offers considerable unexpected potential.

3.1 Literature review: a shared picture

The literature review examined 25 research studies and reports. The most significant outcome was that this led to a collective definition and shared picture of MLS. The definition has been included in a table explaining the functions of the different layers in the MLS concept, and examples of such measures (see Table 1 in Chapter 1).

The review also gave rise to a shared picture of the circumstances in the polder during a flood, e.g. where the principal threats come from. These findings are now more widely known by the stakeholders, and were also used during the expert session and the research into community capacity. For the sake of clarity they are summarized again below.

- The geographical characteristics of the Alblasserwaard and the Vijfheerenlanden area influence the course of a possible flood.
  - The eastern part lies highest, the western part lies lowest.
  - A flood would inundate all infrastructure except for the dikes.
  - If the threat came from a storm surge at sea, then only the western part of the area would be at risk and flooding would only affect this western area.
  - If the threat came from high water levels in the rivers, then the eastern part of the area would be most at risk. However, if a dike were to fail in the eastern area, floodwaters would affect the whole area, because the land inclines downwards from east to west. It would nevertheless take several days for the floodwaters to reach the western edge.
  - The number of locations that are suited as shelters for vertical evacuation is limited by a combination of considerable floodwater depth and the small number of high-rise buildings.

A second group of conclusions concerns the possibilities for taking measures in a given safety layer.

- Measures such as the adaptation of buildings or raising the land inside the dike-ringed zone are not financially viable in the Alblasserwaard and the Vijfheerenlanden area. Opportunities for such measures are present, however, outside the dike-ringed zone.
- The reports mention no damage-limitation measures for infrastructure and businesses.
- With regard to preventative evacuation, assumptions have been made about how many people can be evacuated (evacuation percentages). The expectation is that improved preparation will raise this percentage.
- The literature contains little information on Layers 3 and 4.
- The relationship between MLS and climate adaptation has been little researched thus far.

* *Literature study Meerlaagsveiligheid in de A5H, minutes of expert session Meerlaagsveilgheid Alblasserwaard Vijfheerenlanden, report Helping hands during a flood.*

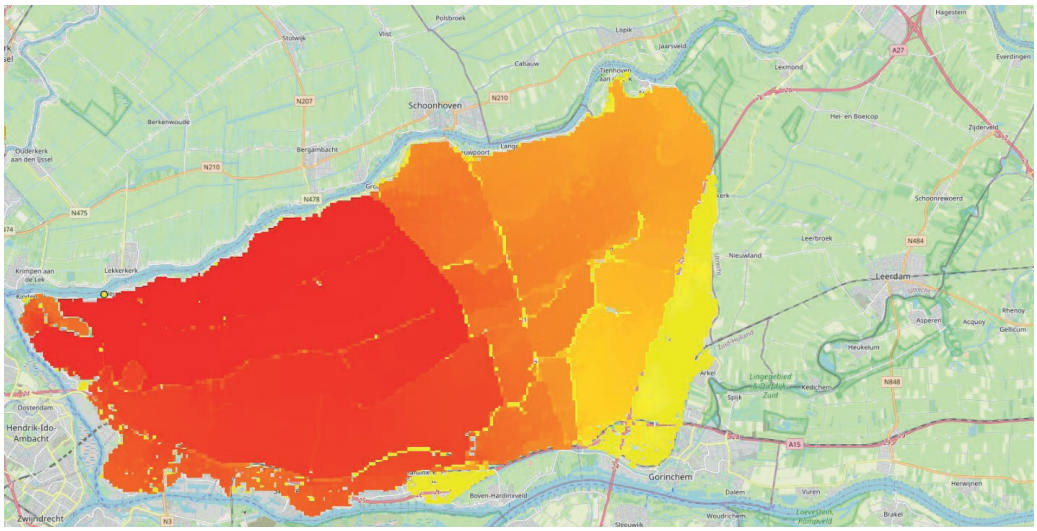


Figure 4: Scenario 1 dike breach near Kinderdijk.

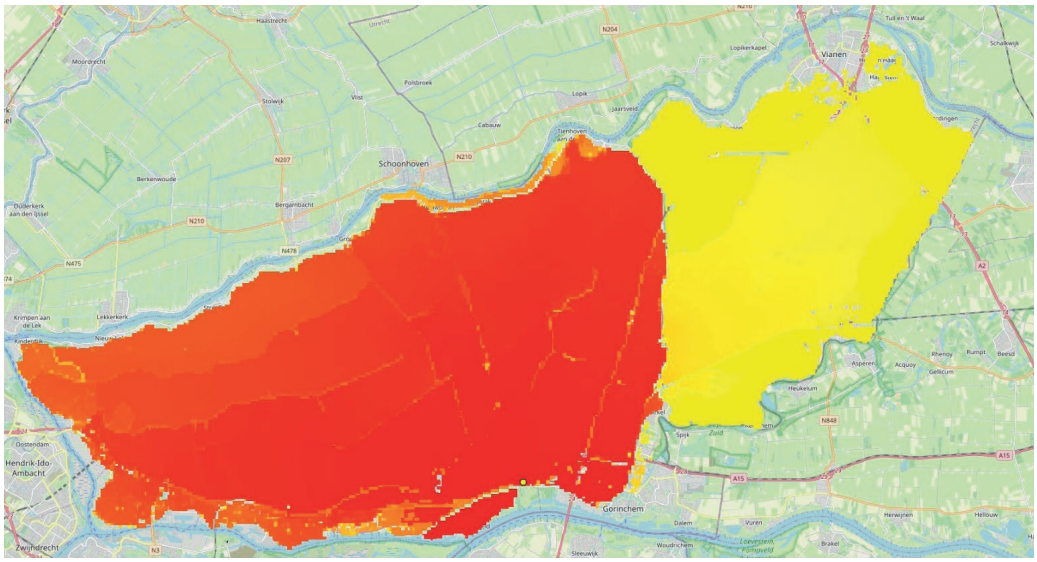


Figure 5: Scenario 2 dike breach near Hardinxveld.

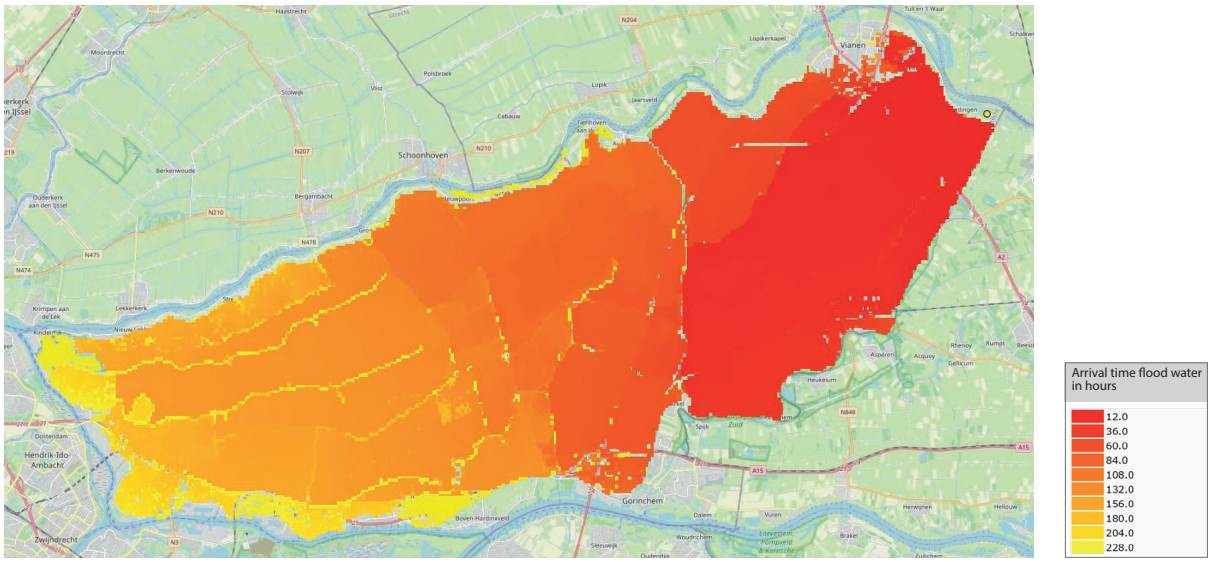


Figure 6: Scenario 3 dike breach near Everdingen.

3.2 Expert session: spatial planning can facilitate evacuation

Spatial planning measures (Layer 2) can contribute towards improved evacuation and, therefore, crisis management (Layer 3). How exactly this could be achieved was the subject of an expert session. Its participants represented the municipalities, the Safety Region, Rijkswaterstaat, the water boards and the province.

The session examined three different flood scenarios and evacuation. The central question addressed was: what kinds of obstacles and bottlenecks are encountered during an evacuation? When we know where these are, we can devise solutions in advance. For each scenario the session identified opportunities, threats and solutions. The solutions turned out to lie in improving traffic movement (networks and flows) and in exploiting differences in elevation. These recommendations have been presented to local and regional authorities. They are not so concrete that they could be turned into immediate plans, and are therefore chiefly agenda-setting in nature.

3.3 Community capacity: make the most of it!

The 'Helping Hands' study examined how the capacity for spontaneous help offered by the community and the emergency aid capacity provided by government could strengthen one another. It

Table 2: Spatial planning solution approaches and measures to facilitate evacuation. Source: Perspectievennota A5H ('A5H Perspectives Memorandum') Sweco 2018.

Focus	Spatial solution approach	Spatial/network measures
I. Ensure that *traffic networks* facilitate preventative evacuation	1. Improve evacuation options (routes and refuges) for the northern Alblasserwaard	A. Improve north-south accessibility
		B. Improve east-west links on Overslagvrije Lekdijk
	2. Use opportunities to link spatial developments with improved evacuation options	A. Use widening of the A15 (by Rijkswaterstaat)
		B. Use maintenance and development of infrastructural projects
II. Ensure that traffic networks optimise *traffic flow*	1. Improve traffic situations and flows in the Alblasserwaard-Vijfheerenlanden area	A. Interconnections at roundabouts, crash barrier crossings to improve accessibility for emergency services, improved junctions, etc.
	2. See I.2	B. See I.2 A&B
III. Use the *elevation differences* in the area for temporary or permanent evacuation and refuge purposes	1. Ensure that the Vijfheerenlanden area stays as dry as possible and continues to function (utilities and emergency services)	A. Develop Vijfheerenlanden utilities independent of Alblasserwaard
		B. When the Alblasserwaard-Vijfheerenlanden water management system is renovated, ensure that 5H can be drained independently of Alblasserwaard
	2. Develop/improve higher-elevation area in Alblasserwaard	A. Multifunctional dikes for villages (as at Streefkerk); non-overtopping dikes
		B. Build/develop along the Waal/Merwede rivers so as to create dry 'safe havens' and keep dikes passable (roofs, multifunctional dikes, more elevated areas outside the dikes)
		C. Co-develop areas outside the Alblasserwaard dikes as temporary evacuation locations

included a literature review and interviews with the representative of social organizations, such as the chairman of a football club and church leaders. The outcomes were collated and discussed with experts to identify opportunities for synergy.

Four principles

The study revealed that the community capacity for spontaneous assistance rests on four general principles:

1. Mutual self-reliance: community capacity begins with the acknowledgement that communities are mutually self-reliant, and that the resilience offered by this mutual self-reliance is indispensable when flooding is imminent.
2. Leadership: personal leadership, whether in government or in society, increases community capacity through clear decision-making and the communication of authoritative information.
3. Unambiguity: a clear, unambiguous message gives direction to community capacity, and creates opportunities for society to contribute towards this direction.
4. Partnership in responsibility: the structures and professionalism of government capacity, and the dynamics and power of community capacity, strengthen one another when they experience partnership in responsibility.

The four principles translated for the Alblasserwaard and the Vijfheerenlanden area

In the rural parts of the Alblasserwaard and the Vijfheerenlanden area, mutual self-reliance is expressed through a combination of social cohesion and entrepreneurship. In the urban parts of this area the social networks are weaker. There is also a difference in leadership between the towns and the villages; villages often include prominent 'leading' figures, whereas in urban areas leadership is more closely linked to institutions such as societies, associations, the church or government.

The area is characterized by a somewhat sceptical attitude towards the authorities, and for this reason the clarity and unambiguity of decision-making and communication are important to conveying urgency and offering action perspectives. This critical attitude towards government also demands partnership in responsibility, so that residents feel a sense of co-responsibility.

What to do in a flood

There are three emergency response phases to a flood: evacuation, escape and rescue. In the examination of community capacity, the evacuation response distinguished between two scenarios: seawater flooding and river flooding. For each

Table 3: Summary of community help capacity and the opportunities for synergy with government capacity in the event of flooding in the Alblasserwaard and the Vijfheerenlanden area.

	Evacuation		Escape	Rescue
	High river levels, risk of flooding	Storm surge, risk of sea flooding		
General	• Everyone has to/wants to leave	• Keep calm and head east • Horizontal and vertical evacuation	• Escape is evacuation under pressure	• All help is needed
Community capacity	• Evacuate yourself and help others • Keep calm	• Follow the instructions • Help your neighbours	• Help each other to safe havens • Decentralized communication	• Vessels • Shelter • Decentralized communication
Synergy between governmental capacity and community capacity	• Facilitative actions • Clear, visible message in which specific actions are promoted	• Top-down coordination • Authoritative decision-making • Ask communities for help	• Safe havens • The right call • Decision-making under pressure	• Smart allocation of tasks • Inform people in the area

scenario the situation was assessed, together with the messages that needed to be sent to people in the area or to the authorities. The possibilities for being well prepared for a flooding emergency are summarized in the table below.

Six recommendations for strengthening the contribution of community capacity to governmental capacity

The study showed that community capacity can strengthen governmental capacity provided it is well prepared to do so. These results have been translated into a number of recommendations for emergency workers preparing for a flooding emergency (in the 'cold' phase):

1. Prepare the network. Map the social networks and ensure that these can be reached and used quickly by emergency workers.
2. Key decisions. Identify possible dilemmas, find out whether key decisions could be taken in advance, and document them. This contributes towards the clarity and unambiguity of messages.
3. 'Many channels, one message'. Disseminate the same message detailing action perspectives through all possible communication channels.
4. Refuges. Ensure that emergency workers know where the safe havens are. When planning future spatial developments and dike reinforcement work, examine the possibility of creating new safe havens.
5. Facilitate decentralized coordination. Communications and assistance can take place without a central intermediary, and this offers great potential benefits. Online applications can support this. The government can also examine whether useful links can be made between demands for government help and the spontaneous capacity for help offered by the community.
6. Acknowledge spontaneity. Government must acknowledge and appreciate the community capacity for spontaneous assistance. This contributes importantly towards its usefulness

'International' conclusions

The study also generated a number of conclusions in an international context:

- The relationship between government and society affects the possibilities for spontaneous help from the community. In the Netherlands, emergency help is dominated by government; in the UK, for instance, it is provided by a combination of government and community.
- For many FRAMES partners the concepts of equality, mutual understanding and partnership between government and society are regarded as important factors that contribute towards resilience against flooding. This is confirmed by the present study, and has led to the inclusion of 'partnership in responsibility' as one of its guiding principles.
- It has become clear that decentralized communication and coordination offer great potential. Modern communication channels are making this approach more and more feasible. Moreover, help does not then have to be constrained by national borders.
- Crisis management especially, but also the recovery phase, evoke all kinds of reactions from society. This social dimension has been examined, but deserves further research.

Safety Region: "The 'Helping Hands' study helps us"

"A dike failure is a large-scale disaster," explains a representative of the Safety Region of South Holland South. "So as a Safety Region we are constantly working to answer the question: what if a dike broke? We already know that as professional emergency workers we could not deal with all the consequences alone.
More and more initiatives are coming from the community itself. How can we make the best use of these initiatives, and what do we need to do as emergency workers to direct their efforts? FRAMES gave us an opportunity to research into this. The 'Helping Hands' study helps us to think about the community capacity for assistance during an emergency, but it also yields useful insight into how spontaneous help can be guided."

4 Policy recommendations: look beyond your own layer

The conclusions and recommendations of the various research components of this study have been discussed with stakeholders, experts and the other FRAMES partners. A number of general policy recommendations have accordingly been formulated, which are also applicable in other fields

Make MLS a shared task

The different layers of the MLS concept also have different 'owners'. If governments wish to take the MLS concept a step further, these owners will have to look further than the borders of their own layer. The solution to a problem in one layer is sometimes located in another; by entering into a dialogue, solutions can be found. Knowledge also needs to be exchanged between layers. The first step is for all stakeholders to arrive at a shared picture of the physical principles of an area and its evacuation options. The province can play a guiding role in linking the different layers and their respective owners.

Exploit moments of synergy

The measures needed to increase water safety or to reduce the likelihood of damage from a disaster are expensive. Spatial developments (e.g. road rebuilding, dike reinforcement or area development) can be exploited as useful moments of potential synergy. For instance, could a given area development plan include the creation of a refuge at a raised location? Could road reconstruction or dike reinforcement work include the removal of an obstacle to a future evacuation? In order to best exploit such moments of synergy it is important that municipalities and the province incorporate the MLS concept into their own environmental visions; this allows it to become formally embedded policy.

Align decisions and activities at the area level

The A5H area does not stand alone, and different layer measures taken just outside the area can also contribute towards water safety and crisis management. This could include river enlargement or refuge construction work, for instance. It is essential to discuss such developments with the surrounding regions. The same applies to the community capacity for spontaneous help, which is likely to also come from outside the affected area and will require some synchronization. At the same time it should not be forgotten that in the event of a disaster, surrounding areas may also be experiencing their own emergency situations. These cross-border mutual dependencies make MLS a complex issue, and for this reason broad-based harmonization is advisable.

Approach financing as a collective responsibility

Prevention (Layer 1) is funded by the Hoogwaterbeschermingsprogramma (High Water Protection Programme). However, if an ambition emerging in another layer could be incorporated into an existing prevention measure (e.g. dike reinforcement), the 'owner' of the ambition is generally expected to meet the additional costs. This assumption inhibits the application of MLS. It is important that government authorities discuss these issues and also examine the mutual benefits, namely increasing the overall safety of the area or reducing potential damage.

Be open to help from unexpected sources

The 'Helping Hands' study revealed the strong preparedness shown by residents and businesses in the area to offer emergency help. This is to be expected: they live and work in the area and have strong social

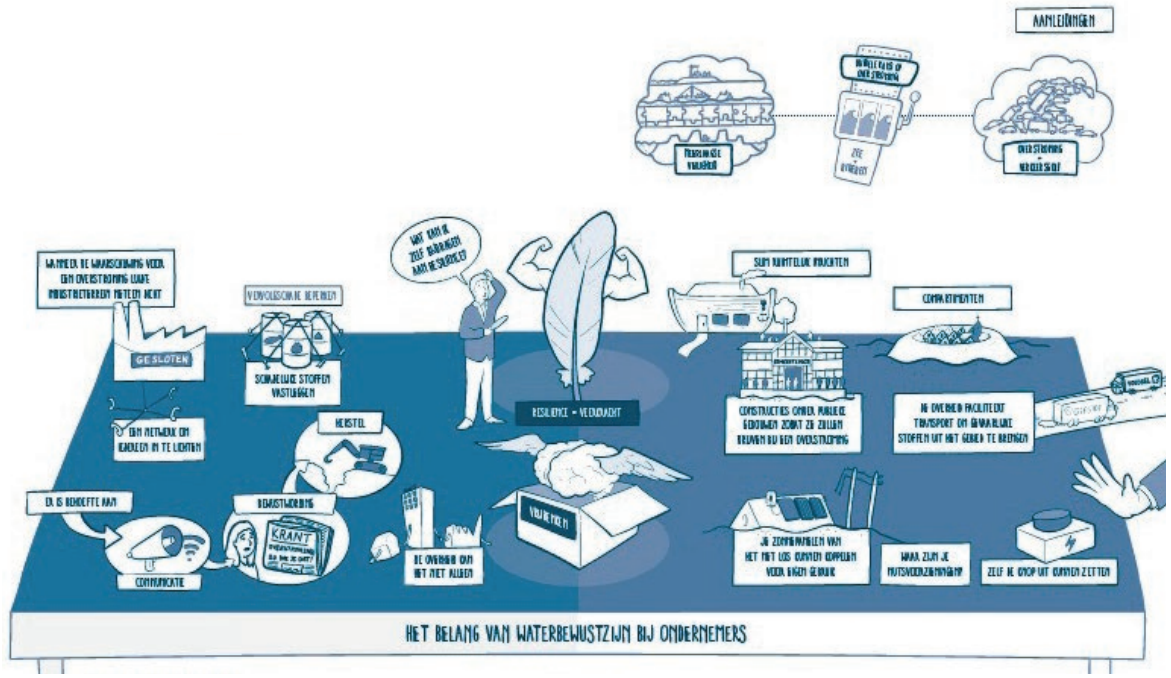


Figure 7: results of the Innovation Tables.

and other links with it. The point is to be open to this form of spontaneous help. The study delivered four guiding principles in this regard, as well as concrete recommendations for allowing spontaneous community help to strengthen government capacity in an emergency.

Continue investing in water awareness

The research has shown that residents, entrepreneurs, officials and administrators in the Alblasserwaard and the Vijfheerenlanden area are all aware of the risk of flooding. There is so much general confidence in the dikes, however, that there is little idea of how quickly and how deeply the area would be flooded in the event of a dike failure, and where they might be able to go in the event of an evacuation. Discussions of MLS could therefore also be used to raise water awareness (see the box on Innovation Tables and water awareness, below).

'Innovation Tables' and water awareness

Investing in water awareness remains necessary. It is also vital to share knowledge about exactly how, and how deeply, an area could be flooded before discussions about multilayer safety can begin. This was demonstrated during the 'Innovation Tables' organized by the 'Linking Water and Space' programme for interested entrepreneurs. One of these meetings looked at possible innovation opportunities to reduce the consequences of flooding. The FRAMES project leader gave a presentation on multilayer safety, after which it was intended to discuss these innovations together with the entrepreneurs. Many of the entrepreneurs present, however, were shocked that floodwaters in the area could be so deep. They wanted to know first of all what government would do in case of a flood, and what they themselves ought to do, and might be able to do, to protect their goods, property and workers. For these entrepreneurs it was clearly too early to talk about exchanging innovative ideas and limiting flood damage.

5 What's next? Link, press ahead and scale up!

The FRAMES study concludes on 30 April 2020. What comes next? How can these conclusions and policy recommendations be taken a step further? One thing is certain: there's work to be done by all those involved – the province, the municipalities, the Safety Region and other stakeholders inside and outside the Alblasserwaard and the Vijfheerenlanden area. The next steps have to do with linking, pressing ahead and scaling up.

Province: linking

The province faces the challenge of linking the FRAMES outcomes with those from other MLS processes, such as the Vitaal en Kwetsbaar ('Critical and Vulnerable') study in the Delta Programme. It is also up to the province to develop the MLS concept in environmental policies and programmes. The province should also examine how it wishes to apply this principle in other domains.

Other parties in the Alblasserwaard and the Vijfheerenlanden area: keep working together and moving ahead

The stakeholders in the A5H Area Council continue to work together. For instance, during the Rijnmond-Drechtsteden Delta Programme area conference a session was organized to discuss the 'Helping Hands' study. In this way municipalities and the Safety Region can continue to convey the outcomes of this research to other partners and other areas. The stakeholders should also examine how they wish to translate the recommendations into concrete action.

Parties outside the Alblasserwaard and the Vijfheerenlanden area: scale up

Outside the area, too, other parties are looking at the MLS concept. The policy recommendations we have produced in FRAMES are also relevant to them. This will allow the MLS concept to be scaled up.

Municipality: "The added value is becoming clearer all the time"

"When the FRAMES project started we were sceptical of its added value," explains a representative of the municipalities. "But with all the outcomes of its component projects, the added value is becoming clearer all the time. The research into spontaneous help in flooding, for instance, showed us where opportunities lie. Naturally, our residents would leap into action if they were facing a flood. Together with the Safety Region we are keen to examine how we can best guide and direct that action."

Reflection by the FRAMES project leader, Lucy Smeets

"Layer by layer, find solutions for one another"

"I found the visits to the other FRAMES partners very inspiring. I was surprised to learn, for instance, that the MLS concept had long been applied in several other countries, with the different layers being less strictly separated than they are in the Netherlands.

It was also interesting to hear and see how different countries deal with flooding problems. The local situations are different, but in surprisingly many areas the problems people face are the same, such as: how do you persuade local administrators to work on something bigger together, instead of just taking care of their own corner? Or: how do you deal in an adaptive way with the growing risks of flooding from climate change?

Civilian participation in Britain was a real eye-opener for me. British society is organized in a different way; the British have less confidence in their government than they do in the Netherlands, Belgium or Germany. Volunteer organizations like the Rivers Trusts and the National Flood Forum are engaged in water management and actively involve civilians. This kind of direct civilian involvement might not work in the Netherlands, but the approach did inspire me to describe it in the meetings of the 'Linking Water and Space' programme. It then turned out that the Safety Region was also wondering how to involve civilians in emergency help, and that's how the 'Helping Hands' study came about.

Looking back, this has been a particularly instructive and useful process. The stakeholders in the area had originally indicated that they expected little added value from MLS, but it gradually became clear that MLS is not just a question of taking certain measures in your own layer – it's also about entering into a dialogue, and searching for opportunities and solutions for one another."

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Colophon

The province of South Holland has participated in the European Interreg program FRAMES (Flood Resilient Areas by Multi LayEred Safety). The sub-studies and the final report were drawn up in collaboration with the A5H Area Council.

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