



Delft, Netherlands, the

Local progress report on the implementation of the 10 Essentials for Making Cities Resilient (2013-2014)

Mayor:	Delft is at risk from pluvial flooding. During extreme rainfall events, particularly critical infrastructure might not continue to function. Also Delft can experience fluvial flooding from a regional river from which Delft is protected by secondary flood defences that could breach in extreme situations. Finally Delft, and the entire Western part of the Netherlands are at risk from coastal flooding.
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Essential 1

Put in place organization and coordination to understand and reduce disaster risk, based on participation of citizen groups and civil society. Build local alliances. Ensure that all departments understand their role to disaster risk reduction and preparedness.

How well are local organizations (including local government) equipped with capacities (knowledge, experience, official mandate) for disaster risk reduction and climate change adaptation?

Level of Progress achieved: 5

Description of Progress & Achievements:

On account of the Dutch laws, risk management is a responsibility for the regional government (Safety Region Haaglanden).

However, knowledge institutes are sharing much information with the municipality. Delft University of Technology (TU Delft) is an important partner of the municipality Delft. The university has grouped their knowledge in a Flood Risk Center (DFRC) and this center is developing new technologies and strategies for flood risk management. Examples of their activities are the new 3Di versatile water management instrument and the testing and demonstration site for innovative temporary flood defenses (Flood Proof Holland). More information is provided in the additional related links.

Besides TU Delft, innovation and capacity building is provided by UNESCO-IHE, Institute for Water Education and the knowledge institute Deltares. These institutes are also strongly linked with the municipality.

Furthermore, the Waterboard of Delfland has acquired ample knowledge in the field of water management - already since the year 1289. The Safety Region Haaglanden has extensive experience with general disaster and crisis management.

Related links

- > [Flood Proof Holland](#)
- > [3Di](#)
- > [Waterboard van Delfland](#)
- > [Safety Region Haaglanden](#)
- > [Province South-Holland \(Zuid-Holland\)](#)

- > [Province South-Holland \(Zuid-Holland\)](#)
- > [Spatial Adaptation Knowledge Portal](#)

To what extent do partnerships exist between communities, private sector and local authorities to reduce risk?

Level of Progress achieved: 4

Description of Progress & Achievements:

Extensive cooperation exists between the knowledge institutes (Deltares, UNESCO-IHE, TU Delft; see previous question) and the local government (municipality). Also, the cooperation between the Waterboard Delfland and the municipality is successful.

This cooperation is amplified in the region Delft Zuidoost, where the municipality, TU Delft, DUWO, and the Waterboard of Delfland are integrating their knowledge in order to achieve a healthy and green environment in managing flood risks. The main project in this neighborhood is called 'Groen Blauw Delft Zuidoost' and this project is integrating knowledge of above mentioned institutions in order to optimally exploit the opportunities provided by green policies to strengthen DRR.

The Safety Region Haaglanden has the ambition to make the water management system more controllable and more sustainable before the end of 2015. To reach this goal, the region has set up the program Waterkadar Haaglanden. This program has set up an association between many different local organizations, including the nine municipalities of the region, the Waterboard of Delfland and the province South-Holland. In 2009, the program Waterkader Haaglanden has ended and the cooperation has continued in the Bestuursakkoord Water en Klimaattafel (water and climate table), signed on 16 November 2011. On November 22 and June 26, 2013, the Waterboard of Delfland organized meetings (Dutch: Watertafel) in which all municipalities within Delfland, the Waterboards Rijnland, Schieland, Krimpenerwaard and the Safety Region Haaglanden participated.

The metropolitan zone Haaglanden also encouraged cooperation in the region by facilitating the project Regionale klimaatAdaptatie Strategie (RAS). In RAS, the nine municipalities of the metropolitan zone Haaglanden, the province Zuid-Holland (South-Holland), and the Waterboards Delfland and Rijnland were integrating their knowledge and experience in order to find solutions for climate change related problems.

Up to date, the cooperation between the municipality and the private sector is moderate.

Reference documents

- > [Summary Bestuursakkoord Water en Klimaattafel \(water and climate tabel\)](#)

Related links

- > [Regional climate adaptation strategy](#)
- > [Watertafel meeting Waterboard Delfland](#)
- > [Watertafel meeting Waterboard Delfland](#)

How much does the local government support vulnerable local communities (particularly women, elderly, infirmed, children) to actively participate in risk reduction decision-making, policy making, planning and implementation processes?

Level of Progress achieved: 4

Description of Progress & Achievements:

Societal organizations and/or inhabitants have organized various evening meetings/workshops, in which discussion groups (formed by inhabitants) debate on topics, including water management. These evening meetings are organized on a frequent basis. On November 19, 2012, a workshop was organized for the project 'Groen en Water rond het huis' (English: Green and Water around the house), in which 36 people (including many inhabitants of Delft) have developed new ideas for a specific polder area. As a further example: in a meeting on January 23, 2013, 16 teenagers from the Wippolder had to create new plans for a certain public space. The elaborations of these plans can be found in the reference documents.

The municipality of Delft runs an environmental and education center, named the Papaver. Most education is concentrated on children who are attending primary or secondary school and is given in the form of workshops, debates and games. Throughout the year, the Papaver runs a number of different exhibitions on environmental topics, including water (management). Furthermore, the Papaver is the editor of many books, videos and educational materials related to these topics. Besides these educational activities, the Papaver is organizing meetings in which new plans, like transitioning from artificial to more natural riversides (a project in Groen Blauw Delft Zuidoost), are discussed with inhabitants.

Reference documents

- > [Inhabitants participating in the workshop 'Groen en Water rond het huis'](#)
- > [Ideas of inhabitants resulted from the workshop 'Groen en Water rond het huis'](#)
- > [Workshop for children in the Papaver](#)
- > [Excursion for children, organised by the Papaver](#)

Related links

- > [Environmental and education center 'the Papaver'](#)
- > [Local projects \('Groen Blauw Delft Zuidoost'\)](#)

To what extent does the local government participate in the national DRR planning?

Level of Progress achieved: 4

Description of Progress & Achievements:

The municipality of Delft is working in close cooperation with regional governments (Province, Waterboard and Safety Region) and the national government in the framework of the Delta Programme Safety (Dutch: Delta programma Veiligheid).

Furthermore, Delft joined the national Coalition Water, which is an project that focuses on bringing private and societal organizations together. The project 'Groen en Water rond het huis' had to make inhabitants in Delft more aware of their possibilities to make the city greener and more flood resilient. This subproject resulted from the project Groenblauw Delft Zuidoost. Groenblauw Delft Zuidoost (and hence Groen en Water rond het huis) is supported by the Ministry of Infrastructure and the Environment and thereby it is influenced by national DRR planning.

The project Delft Smart City is looking at the possibilities to exploit technological and innovative opportunities in order to deliver the social and economic ambitions for Delft; among other, flood risk reduction. Here the Ministry of Infrastructure and the Environment is also involved.

Essential 2

Assign a budget for disaster risk reduction and provide incentives for homeowners, low-income families, communities, businesses and public sector to invest in reducing the risks they face.

How far does the local government have access to adequate financial resources to carry out risk reduction activities?

Level of Progress achieved: 2

Description of Progress & Achievements:

The municipality of Delft always had a frontrunner position when it comes to investments in DRR. Unfortunately, the municipality is (temporarily) losing this frontrunner position, because of their financial situation. Delft is still able to invest in the basic requirements, but nowadays there is no budget for the additional investments needed stay at the top level.

To what degree does the local government allocate sufficient financial resources to carry out DRR activities, including effective disaster response and recovery?

Level of Progress achieved: 2

Description of Progress & Achievements:

The municipality experiences some financial distress, which does not stimulate DRR investments.

However, DRR investments are still made and where possible they are integrated into local economic and social development plans. In the neighborhood Delft Zuidoost, organizations, including the municipality and the Waterboard, have bundled their knowledge to use green ideas (which normally have broad public support) to significantly reduce the chance of flooding. For example, the housing cooperation DUWO has plans to construct a large pond in a park between the

Kanaalweg and Mijnbouwstraat. This is not only reducing the chance on flooding (because of the water storage capability), but also increasing the quality of life for inhabitants.

What is the scope of financial services (e.g. saving and credit schemes, macro and micro-insurance) available to vulnerable and marginalised households for pre- disaster times?

Level of Progress achieved: 4

Description of Progress & Achievements:

In general, adequate financial services are available to vulnerable and marginalised households -- for example, social security, start-up loans, rent subsidies, moving subsidies, etc. These services are not specifically for DRR.

To what extent are micro finance, cash aid, soft loans, lone guarantees etc available to affected households after disasters to restart livelihoods?

Level of Progress achieved: 4

Description of Progress & Achievements:

The local government of Delft is not taking any steps in this field, but the national government does. The Dutch national government has a programme to compensate flood damages of affected households within the dike ring areas; a disaster compensation fund.

Related links

> [Flood damage compensation fund](#)

How well established are economic incentives for investing in disaster risk reduction for households and businesses (e.g. reduced insurance premiums for households, tax holidays for businesses)?

Level of Progress achieved: 1

Description of Progress & Achievements:

No economic incentives are present for investing in flood risk reduction at the household level. For the households lying within the dike ring areas, individual protection measures have been demonstrated not to be economically efficient. This is because of the relatively high flood safety standards in the Netherlands (including Delft).

Besides that, Delft has transformed from an initiating organization to a directing organization, which gives Delft a kind of mediator role.

To what extent do local business associations, such as chambers of commerce and similar, support efforts of small enterprises for business continuity during and after disasters?

Level of Progress achieved: 1

Description of Progress & Achievements:

No support is available for small enterprises for business continuity during and after disasters.

Essential 3

Maintain up-to-date data on hazards and vulnerabilities, prepare risk assessments and use these as the basis for urban development plans and decisions. Ensure that this information and the plans for your city's resilience are readily available to the public and fully discussed with them.

To what degree does the local government conducted thorough disaster risk assessments for key vulnerable development sectors in your local authority?

Level of Progress achieved: 4

Description of Progress & Achievements:

On a national level, the current and potential risks of the various dike ring areas are discussed in the government publication Delta Programme 2015.

On a local level, for the historical city center of Delft, many risks assessments have been made. The municipality developed the Gemeentelijk Riolerings Plan Delft 2012-2015, which gives an overview of the municipal tasks in the field of waste water, rainwater and groundwater. This document contains some valuable assessments, like a map displaying the major potential spots of water nuisance in Delft. This map can be found in the additional documents section.

The 3Di versatile water management instrument conducted a testcase in the city of Delft. 3Di is a new model (developed by the TU Delft, Deltares and Nelen & Schuurmans) which makes it possible to simulate heavy rainfall and assess the areas and extent of water nuisance in public spaces by combining new calculation methods, a new detailed Digital Elevation Model (AHN 2) and new land use maps. Because this model allows to map the places of water nuisance very precisely, the municipality is able to take more efficient risk reducing measures.

For the area Delft Zuid-Oost, an extensive research has been done by the TU Delft, DUWO and the municipality, named Delft Spetterstad. The aim of this project was to make this neighborhood more climate proof and give the area more capabilities for water storage. Different solutions have been constructed in this field and the effects of these solutions have been simulated through the application of Serious Gaming. The final article of this research can be found in the related documents section.

Reference documents

- > [Gemeentelijk Riolerings Plan Delft 2012-2015](#)
- > [Hotspots water inconveniences for the historical center](#)

- > [Testcase 3Di](#)
- > [Testcase 3Di](#)
- > [Report Delft Spetterstad](#)
- > [Cartoon Dekft Spetterstad](#)

To what extent are these risk assessments regularly updated, e.g. annually or on a bi-annual basis?

Level of Progress achieved: 3

Description of Progress & Achievements:

No regulations exists regarding the time period of review of risks assessments in Delft. But as shown above, a lot of activities are ongoing in this research field. This means that practically, the risk assessments are updated regularly.

Statutory assessments of the flood defenses are undertaken on a 5-yearly basis. This includes updating the natural boundary conditions and the incorporation of new knowledge on failure mechanisms.

The safety standards for the flood defenses in the Netherlands have been updated in September 2014, as a result of the Delta Decision on Water Safety. The new safety standards have been based on an in-depth risk assessment, reported in the Delta Programme 2015. The previous safety standards dated back to the 1960s.

The EU Flood Directive (In Dutch: ROR) requires Member States to draw up flood risk maps and establish flood risk management plans focused on prevention, protection and preparedness. These steps need to be reviewed every 6 years in a cycle coordinated and synchronized with the Water Framework Directive (WFD) implementation cycle.

Related links

- > [Delta decision on Water Safety](#)

How regularly does the local government communicate to the community, information on local hazard trends and risk reduction measures (e.g. using a Risk Communications Plan) including early warnings of likely hazard impact?

Level of Progress achieved: 4

Description of Progress & Achievements:

The local government has the capability of using sound cars to warn the inhabitants for upcoming danger. The order to use sound cars in an emergency will be given by the city major Bas Verkerk.

Furthermore, the Waterboard of Delfland pays some attention to risk and crisis communication in a chapter of their contingency plan, in which their major tasks and policies are stated.

The central government has launched a number of websites, where inhabitants can find information on potential flood depths for their postal code area, as well as advise on preparedness measures and what to do in case of a flood. The links to these websites can be found in the 'additional links' box.

'www.onswater.nl' provides information about e.g. the land height (measured in m +NAP, Nieuw Amsterdamse Peil) and the potential flood depths for a certain postal code area.

'www.overstroomik.nl' also provides information about the potential flood depths, and displays this information in a spatially explicit way (i.e. on a map). There are also maps which show on a household level whether there is a dry floor available to evacuate vertically. Other maps provide information about which highways/railways are flooded and which are still useable in a major flooding.

'www.watdoeje.nl' provides information about what to do in a major flood. The different required steps are displayed for both vertical evacuation and horizontal evacuation. Also, the advised materials to keep at home are shown.

The central government operates a national alarm system, named NL-alert. With this system, the local government can send a message (on national or very local levels) to mobile devices of inhabitants, from which they can then derive information about the threat and the required steps to be taken.

Related links

- > [OnsWater](http://www.onswater.nl)
- > [Overstroomik](http://www.overstroomik.nl)
- > [WatDoeJe](http://www.watdoeje.nl)
- > [NL Alert](http://www.nl-alert.nl)

How well are local government risk assessments linked to, and supportive of, risk assessments from neighbouring local authorities and state or provincial government risk management plans?

Level of Progress achieved: 4

Description of Progress & Achievements:

In this context, it is important to note that the organizations concerned with DRR (Waterboard van Delfland and Safety Region Haaglanden) are focused on a regional scale, and not on a local scale. This ensures that risk assessments take account of the neighbouring local governments.

Related links

- > [Extent of Safety Region Haaglanden](#)
- > [Extent of Waterboard van Delfland](#)

How well are disaster risk assessments incorporated into all relevant local development planning on a consistent basis?

Level of Progress achieved: 5

Description of Progress & Achievements:

In the Netherlands, every municipality has to develop a land-use plan (so called 'Bestemmingsplan') every 10 years. This document describes the functions of different areas in the municipality Delft. DRR is an important factor to take into account while making these plans. Delft has set out to establish new local developments plans, aimed to reduce flood risk, in areas with relatively much water nuisance.

The waterboard affects land- use planning by using the 'watertoets'. The watertoets is an obligatory process tool for spatial developers to consult the water authorities in case of some planned development that may influence the water system. This instrument is mainly being used for rainfall flooding.

Every year, the national government announce the part of the Delta Programme 'Nieuwbouw en Herstructurering'. With the knowledge and experience received by developing this program, an important water decision has been made in 2015, named 'Deltabeslissing Ruimtelijke Adaptatie'. An aim in this decision was to create a portal which encourages spatial adaptation in cities. Last October this portal, named Spatial Adaptation knowledge Portal (Dutch: 'Kennisportaal Ruimtelijke Adaptatie'), was officially opened. The portal is giving a framework for climate adaptation in urban areas, providing tools to list cities ambitions, share knowledge with other cities or get help from professionals in order to make a city climate adaptive. The goal of this portal is to make urban areas more resilient to heavy rainfall, floods or heat waves. Delft actively contributed to this portal, by providing their knowledge (from e.g. TU Delft, Deltares) and experience.

Related links

- > [Watertoets](#)
- > [Spatial Adaptation Knowledge Portal](#)

Essential 4

Invest in and maintain critical infrastructure that reduces risk, such as flood drainage, adjusted where needed to cope with climate change.

How far do land use policies and planning regulations for housing and development infrastructure take current and projected disaster risk (including climate related risks) into account?

Level of Progress achieved: 3

Housing	Yes
Communication	No
Transportation	No
Energy	Yes

Description of Progress & Achievements:

Delft is trying to implement land use policies and planning regulations as good as possible in the Bestemmingsplan, as told in the previous essential. However, spatial planning regulations for flood risk reduction does not have primary importance in the area, since the safety standards of Delft's dike ring are really high (1/10.000 a year, see additional documents). So sometimes Nevertheless, the municipality is always searching for solutions in which both the flood risk is reduced, and the quality of life is increased.

Reference documents

> [Safety standards by dike ring area](#)

How adequately are critical public facilities and infrastructure located in high risk areas assessed for all hazard risks and safety?

Level of Progress achieved: 2

Description of Progress & Achievements:

Critical public facilities in Delft do get the same quality and quantity of flood risk assessment as regular public areas. This means no special risk assessments are made for critical infrastructure. However, risky areas are inventarised.

How adequate are the measures that are being undertaken to protect critical public facilities and infrastructure from damage during disasters?

Level of Progress achieved: 2

Description of Progress & Achievements:

Agreements have been made with / among critical infrastructure providers to inform each other in an early stage, so that services can be switched off before a flood in order to reduce damages and speed up recovery.

With the Delta Decision on Spatial Adaptation, the central government ensures that by 2050 national vital and vulnerable functions are more resistant to flooding and that it has adopted policy and laws for this in 2020 or earlier if necessary

Related links

> [Report Delta Programme 2015](#)

Essential 5

Assess the safety of all schools and health facilities and upgrade these as necessary.

To what extent have local schools, hospitals and health facilities received special attention for "all hazard" risk assessments in your local authority?

Level of Progress achieved: 2

Schools	No
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Hospitals/ health facilities No

Description of Progress & Achievements:

Regarding to flood risk assessment, no differentiation is made between critical public facilities and regular public areas. However, special attention is given to locations with a high risk.

Related links

> [Risk map](#)

How safe are all main schools, hospitals and health facilities from disasters so that they have the ability to remain operational during emergencies?

Level of Progress achieved: 2

Schools	No
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Hospitals/ health facilities No

Description of Progress & Achievements:

As for coastal/river flooding, it is not the intention of policy / planning to keep affected schools and hospitals operational during a disaster. This is due to the nature of flooding in the Netherlands (very small probability, large consequences e.g. in terms of inundation depth and extent).

Schools, hospitals and health facilities in Delft are as safe as other buildings regarding to floods. However, sometimes these buildings can be seen as safer because often they are higher than regular buildings (e.g. houses) and they are often equipped with uninterruptible power supplies which supplies the facility with electricity in times the electric utilities stopped their supply.

Special attention is already given to nursery homes in which the people rooms are situated on the second floor. Only some primary schools have only one floor.

To what degree do local government or other levels of government have special programs in place to regularly assess schools, hospitals and health facilities for maintenance, compliance with building codes, general safety, weather-related risks etc.?

Level of Progress achieved: 3

Schools	Yes
Hospitals/ health facilities	Yes

Description of Progress & Achievements:

All educational institutions must have a safety plan. This plan is called the plan for safety, health and environment (OSP). The OSP contains the actions of a school directed to:

- physical safety (design of the school);
- social security (for example, dealing with aggression and violence);

The plan is mandatory for primary schools, special education, secondary education and vocational education.

In practice, the OSP does not address flood disasters.

How far are regular disaster preparedness drills undertaken in schools, hospitals and health facilities?

Level of Progress achieved: 4

Schools	Yes
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Hospitals/ health facilities Yes

Description of Progress & Achievements:

In 2013, a high-level interregional flood preparedness drill was undertaken in among others Delft, named 'Samen Sterker'. Samen Sterker was organized by four Safety Regions, the Dutch military, the water boards of South Holland, the Province South Holland, hospitals, the Dutch Red Cross and the Dutch rescue-squad. The main goal of this drill was to divide the different tasks efficiently between the different organizations, so that each organization knows and will act on its responsibility. This project organized a drill in Delft on November 6, 2013, in the Reinier de Graaf health facility.

At schools and hospitals general preparedness drills are undertaken on a regular basis. No specific drills are organized for flooding. Regular inspections of back up power generators are undertaken in hospitals.

Essential 6

Apply and enforce realistic, risk compliant building regulations and land use planning principles. Identify safe land for low-income citizens and develop upgrading of informal settlements, wherever feasible.

How well are risk-sensitive land use regulations and building codes, health and safety codes enforced across all development zones and building types?

Level of Progress achieved: 3

Description of Progress & Achievements:

Land use regulations in the city of Delft are homogenous over the whole municipality. Because no significant differences in development and population density (no rural areas) exists in the municipality, all areas get the same amount of attention. However, the neighborhood Delft Zuidooost receives some special research attention and activities in comparison with other neighborhoods.

How strong are existing regulations (e.g. land use plans, building codes etc) to support disaster risk reduction in your local authority?

Level of Progress achieved: 3

Description of Progress & Achievements:

Land use plans and building codes are not being used to foster a culture of DRR. On the other hand, regulations do not act as a barrier to resilient building and land use neither. If desired, the regulations allow for the inclusion of specific DRR requirements.

Essential 7

Ensure education programmes & training on disaster risk reduction are in place in schools and communities.

How regularly does the local government conduct awareness-building or education programs on DRR and disaster preparedness for local communities?

Level of Progress achieved: 4

Programs include cultural diversity issues	No
Programs are sensitive to gender perspectives	No

Description of Progress & Achievements:

Various initiatives from societal organizations and/or inhabitants are organized, in the form of evening meetings/workshops, in which discussion groups (formed by inhabitants) debate amongst each other on topics, including water management. These evening meetings are organized on a frequent basis.

Much of these meetings are organized by the project 'Groen Blauw Delft Zuid-Oost' and 'Delft Spettert'. Some meetings are also organized by inhabitants from all over the city.

Delft also participates in the national Watercoalition, which is an organization concentrating on bringing private and societal organizations together. Delft has done a pilot for this project, named 'Groen en Water rond het huis' which had to make Delft's inhabitants more aware of their possibilities to make the city greener and more flood resilient. '

Furthermore, the municipality of Delft runs an environmental and education center, named the Papaver. Most education is concentrated on children who are attending primary or secondary school and is given in the form of workshops, debates and games. Throughout the year, the Papaver has a couple of different exhibitions on environmental topics, including water (management). Furthermore, the Papaver is the owner of many books, videos and educational materials related to these topics (see Essential 1 for the links).

However, these kind of meetings are dealing with the environment and not specifically with flood risks. Because of the relatively high flood safety in Delft, there

is not enough interest in specifically this topic. Nevertheless it should be note that environmental measures (e.g. greening of the city) have close relationships with flood safety.

Specific flood risk information is communicated to the inhabitants online (see links related to Essential 3).

Related links

- > [Groen Blauw Delft Zuidoost](#)
- > [Watercoalitie \(Groen en Water rond het huis\)](#)

To what extent does the local government provide training in risk reduction for local officials and community leaders?

Level of Progress achieved: 3

Description of Progress & Achievements:

Around 40 times a year, training is provided for the staff of Waterboard van Delfland. For municipality officials, only some periodic regional training is given.

To what degree do local schools and colleges include courses, education or training in disaster risk reduction (including climate related risks) as part of the education curriculum?

Level of Progress achieved: 3

Description of Progress & Achievements:

Many different bachelor and master courses related to geography are given in the Netherlands, and a number of these courses target natural hazards and climate risks specifically. Examples of these courses at Utrecht University and WUR are provided in the links related to this question. Delft also has two internationally recognized institutions offering courses in flood risk. UNESCO-IHE (Institute for Water Education) educates in the master course Water Management and the Delft

University of Technology has a specialization track in the Civil Engineering MSc, named Hydraulic Engineering.

Related links

- > [MSc Earth Surface and Water \(UU\)](#)
- > [MSc Water Science Engineering \(UNESCO\)](#)
- > [Wageningen UR](#)
- > [MSc specialization Hydraulic Engineering \(TU Delft\)](#)

How aware are citizens of evacuation plans or drills for evacuations when necessary?

Level of Progress achieved: 2

Description of Progress & Achievements:

Assigning evacuation routes is the task of the Safety Region Haaglanden. The Safety Region declared that because of the situational dependency (see essential 9) it is not efficient to develop routes for every single situation. Therefore, the Safety Region didn't assign specific evacuation routes, but they only provide a framework to quickly assign suitable routes when more actual information about the flood is present. This means citizens are not aware of evacuation routes in a normal situation.

The inhabitants can obtain information on how to act in case of a flood from a number of websites. The links to these websites can be found in essential 3.

The red cross has launched a national campaign Ready 2 Help to encourage inhabitants to provide help during a disaster.

Related links

- > [Campaign Ready 2 Help](#)

Essential 8

Protect ecosystems and natural buffers to mitigate floods, storm surges and other hazards to which your city may be vulnerable. Adapt to climate change by building on good risk reduction practices.

How well integrated are local government DRR policies, strategies and implementation plans with existing environmental development and natural resource management plans?

Level of Progress achieved: 5

Description of Progress & Achievements:

Integrating DRR policies, strategies and implementation plans with existing environmental development and natural resource plans is always the endeavor of the municipality Delft. This because green adaptation measures provide a wide range of benefits to society and the environment, and typically enjoy a high level of public support.

In framework of the project 'Delft Groen, Natuurlijk Doen', some specific projects are going on nowadays:

- Greening of roof tops. Delft actively informs their inhabitants about the advantages of green roof tops. Green roof tops are biological desirable (attraction for birds/butterflies) and are also functioning as a water storage, so water is gradually transferred to the sewage system.
- Softening of gardens. Delft is trying to transform stony gardens to more natural green gardens. This action entails many different advantages, like a cooling effect in summer, and important for flood risk reduction; they again function as a water buffer.
- The local initiative 'Tegel eruit, Groen erin', opened by former Queen of the Netherlands, Princess Beatrix.
- The development of a park with high water storage capabilities. The housing cooperative DUWO has plans to construct a big pond in a park between the Kanaalweg and Mijnbouwstraat. This not only reduces the chance on flooding (because of the water storage capabilities), but also increases the quality of life for inhabitants.
- The shifting from artificial to more natural riversides (a project in Groen Blauw Delft Zuidoost) in order to create more water buffer and create a higher biodiversity.

Reference documents

> [Tegel eruit, Groen erin opening, by Princess Beatrix](#)

Related links

> [Delft Groen, Natuurlijk Doen](#)

To what degree does the local government support the restoration, protection and sustainable management of ecosystems services?

Level of Progress achieved: 4

Forests	No
Coastal zones	No
Wetlands	Yes
Water resources	Yes
River basins	No
Fisheries	No

Description of Progress & Achievements:

The local government is working to develop, manage, protect and restore new ecosystem services in the area. Besides the small scale green projects stated before, the municipality manages two large scale ecosystems (natural landscapes), named the Delftse Hout and Midden-Delfland. Both areas are multifunctional, since they attract inhabitants for recreational purposes, they stimulate the biodiversity and most important in this case: they act as a water buffer.

Besides the municipality, organizations like the IVN (Instituut voor natuureducatie en duurzaamheid; Institute for green education and sustainability) are also setting up projects for sustainable management and restoration of ecosystems. IVN has a special department for Delft. Each couple of weeks, several activities are organized by IVN Delft and others for restoration of ecosystems. These activities are dependent on an active participation of the community, since all efforts are driven by volunteers.

Related links

> [IVN Delft](#)

How much do civil society organizations and citizens participate in the restoration, protection and sustainable management of ecosystems services?

Level of Progress achieved: 4

Description of Progress & Achievements:

The inhabitants of Dordrecht are very supportive of green projects and often offer their help to the execution of these projects. Organizations as the IVN react on this, and are actively involving citizens in the development and restorations of ecosystems. IVN Delft organizes many activities in which the citizens participate in the restoration of ecosystem services.

Examples of the engagement of inhabitants concerning 'green in the city' projects (Tegel eruit, Groen erin, Groen en Water rond het huis), are already outlined in the previous essentials.

How much does the private sector participate in the implementation of environmental and ecosystems management plans in your local authority?

Level of Progress achieved: 1

Description of Progress & Achievements:

The private sector does not actively participate in the implementation of environmental and ecosystems management plans.

Essential 9

Install early warning systems and emergency management capacities in your city and hold regular public preparedness drills.

To what degree do local institutions have access to financial reserves to support effective disaster response and early recovery?

Level of Progress achieved: 4

Description of Progress & Achievements:

The Safety Region has sufficient resources available for pre-disaster times to prepare for effective disaster response and early recovery.

In the event of an actual flood disaster, the local/regional institutions will have access to national contingency and recovery funds to organize response and rehabilitation.

To what extent are early warning centres established, adequately staffed (or on-call personnel) and well resourced (power back ups, equipment redundancy etc) at all times?

Level of Progress achieved: 5

Description of Progress & Achievements:

It is the responsibility of the Water Management Centre at Rijkswaterstaat - Waterdienst (Lelystad) - to send out warnings for storm surges and river floods, and to liaise with and streamline input from various regional centers. The Water Management Centre is adequately staffed and well resourced.

Related links

> [Baseline Report for Rijkswaterstaat](#)

How much do warning systems allow for adequate community participation?

Level of Progress achieved: 2

Description of Progress & Achievements:

A local early warning system is in place for the area of Delft, which includes communicating via sound-cars, websites (see essential 3 for the links) and TV (local broadcasting)/radio. The local community is actively using these sources of information during high water situations.

However, the last mile of communication is relatively large, as there is very little experience with communicating warning messages. Furthermore, the required actions by the affected households and individuals have not been well-defined (only general messages have been defined, without taking account of the local situation).

In general, the Safety Region addressed that in case the whole area of Delft will be flooded, there is no electricity anymore, because energy companies will close the energy supply in order to reduce the amount of damage to the electricity facilities (and lower the recovery time). This will cause a shutdown of all ITC-facilities (television, mail service etc.) and this is going to reduce the communication possibilities significantly. The Safety Region is not optimistic regarding to this situation. Nevertheless, radio and smartphone are still seen as stable communication platforms since they connect to sensors which transcend the local crisis area. This is why the Netherlands developed the early warning system NL-Alert. With this system, the local government can send a message (on national or very local levels) to mobile devices of inhabitants, from which they can then derive information about the threat and the required steps to be taken. This warning system is declared to be quite reliable in the first couple of hours after the disaster started, because mobile phones can use base stations outside the flooded area.

Related links

- > [NL-Alert](#)
- > [Early Warning Systems in the Netherlands](#)

To what extent does the local government have an emergency operations centre (EOC) and/or an emergency communication system?

Level of Progress achieved: 5

Description of Progress & Achievements:

The Dutch government has a national Crisis Centre (Nationaal CrisisCentrum, NCC), located in The Hague. The NCC is consisting of Ministers and other crisis partners (e.g. Safety Region).

The local municipal crisis center is situated on the Westlandseweg (above the fire department).

The regional crisis center of the Safety Region is based in the neighborhood Ypenburg, also located in The Hague.

The emergency communication system is called C2000. The functioning of the communication system cannot be guaranteed in the event of flood disaster.

Related links

- > [National Crisis Centre, NCC](#)
- > [Regional Crisis Centre](#)

How regularly are training drills and rehearsal carried out with the participation of relevant government, non-governmental, local leaders and volunteers?

Level of Progress achieved: 4

Description of Progress & Achievements:

In 2013, a high level interregional flood preparedness drill had been undertaken in among others, the city of Delft, named 'Samen Sterker'. Samen Sterker was organized by four Safety Regions (including Safety Region Haaglanden), the Dutch military, the Waterboards of Zuid-Holland, the Provincie Zuid-Holland, hospitals, the Dutch Red Cross, and the Dutch rescue-squad. The main goal of this drill was to divide the different tasks efficiently between the different organizations, so everyone knows his responsibilities. Samen Sterker organized a drill in Delft on November 6, 2013, in the Reinier de Graaf health facility.

Besides these examples of large scale drills, more than 40 drills a year are organized by the Waterboard van Delfland. These drills include drills with the dike army; a team of people who are patrolling on the dikes during a storm and/or a high water level (> 2.9meter above NAP) to search for weak spots and forbidden activities. More general drills are organized at least once a year.

For the Safety Region Haaglanden counts that disaster drills are not always organized in Delft and are not always dealing with flood safety. The Safety Region

stated that the most important thing in a drill is to assess if the framework is efficient. When the framework does work, you can apply this framework on different forms of disasters.

Related links

> [Samen Sterker](#)

How available are key resources for effective response, such as emergency supplies, emergency shelters, identified evacuation routes and contingency plans at all times?

Level of Progress achieved: 2

Stockpiles of relief supplies	Yes
Emergency shelters	No
Safe evacuation routes identified	No
Contingency plan or community disaster preparedness plan for all major hazards	Yes

Description of Progress & Achievements:

Key resources for effective response (e.g. sandbags, shelters) are available for Delft in a limited amount only. Delft does have some Sandbags (500-1000), but doesn't have any dedicated emergency shelters, in case of emergency necessary accommodations are requisitioned. The municipality can call upon significant regional and national stores of emergency supplies, located in the Logistics Centre at Zoetermeer. However, the Waterboard van Delfland has got enough emergency pumps and they have got materials to close a starting breach. A good strategy of the Waterboard is lowering the water level in order to create more buffer for the significant amount of incoming water. They also have developed a contingency plan (see essential 10).

According to the Safety Region Haaglanden, no specific horizontal evacuation routes are identified in Delft. This because the construction of these specific routes is practically impossible, since the best route is very dependent on the actual situation. Before an actual flood happens, the government don't know where the breach in the dike or the heavy rainfall is, at what time the breach/rainfall happens (day/night) and on what speed and in which ways the water is approaching. Experience learned the

Safety Region Haaglanden that it is not effective to assign specific evacuation routes, since a specific situation can easily fade away the major routes and some situations (weak dike, heavy storm) don't give enough time for horizontal evacuation.

Agreements with national companies have been made to deliver food, clothing and other life essentials in case of a disaster.

Essential 10

After any disaster, ensure that the needs of the survivors are placed at the centre of reconstruction with support for them and their community organizations to design and help implement responses, including rebuilding homes and livelihoods.

How much access does the local government have to resources and expertise to assist victims of psycho-social (psychological, emotional) impacts of disasters?

Level of Progress achieved: 5

Description of Progress & Achievements:

The municipality of Delft has a number of psychological centers, but these are not designed for large scale disasters. This is not considered viable or desirable.

Other organizations in the Netherlands have specialized in providing psycho-social aid to disaster victims. These are listed below:

- The regional medical emergency service (GHOR, part of the Safety Region Haaglanden) is responsible and has plans for the psychological care administered to victims of disasters (PSHOR psycho-sociale hulpverlening bij ongevallen en rampen). In such cases the GHOR makes use of existing medical en psychological care facilities. The practical implementation of these plans is the responsibility of the regional municipal health service (GGD Haaglanden).
- IVP, the Institute of Psycho-trauma, has more than 20 years of experience in the field of psychological aid to disaster victims. IVP focuses specifically on disasters with a large-scale impact (e.g. the crash of MH17).
- Impact (knowledge centre) offers advice and support to organizations and governments in psychological care after a disaster or crisis.
- Slachtofferhulp Nederland (Dutch Victim Support) gives psycho-social aid to victims and stimulates knowledge acquisition. This organisation has taken care of more than 164.000 psychological victims since 2013.

Related links

- > [IVP](#)
- > [IMPACT](#)
- > [Slachtofferhulp Nederland](#)

How well are disaster risk reduction measures integrated into post-

disaster recovery and rehabilitation activities (i.e. build back better, livelihoods rehabilitation)?

Level of Progress achieved: 4

Description of Progress & Achievements:

The Dutch have a long history of building back better. Large-scale plans have been implemented as response to disaster:

1916 floods (North) => Structural solutions with dams and barriers

1953 flood disaster (South-West) => First Delta Committee / Structural solutions with dams and barriers (Delta Works)

1993/1995 high water levels (Rivers, large evacuations) => Also spatial solutions: Room for the River/Meuse Projects

A unique feature of the recently started Dutch Delta Programme is that it has been initiated not in response to a disaster, but in advance, to be prepared or avoid it.

Related links

> [Room for the River](#)

> [Delta Programme](#)

To what degree does the Contingency Plan (or similar plan) include an outline strategy for post disaster recovery and reconstruction, including needs assessments and livelihoods rehabilitation?

Level of Progress achieved: 3

Description of Progress & Achievements:

The Waterboard van Delfland has a contingency plan with a chapter about recovery and rehabilitation. Here a framework is given on how the area can recover and rehabilitate as fast as possible. In the recovery phase, the most important aspects are care for victims and the recovery of (vital) infrastructure and facilities. Hereby, materials like emergency pumps are needed (provided by the private sector).

In the rehabilitation part of the contingency plan, the Waterboard highlights the need for a specialized team for the rehabilitation and this part of the plan also contains a needs assessment. However, this chapter is rather very small, and comparable with

other components, not much attention is paid to recovery and rehabilitation in Delft's contingency plan.

The municipality has, as part of its local contingency planning, a framework disaster recovery plan, with dedicated officials setting up a special recovery team in case of emergencies. Physical care for victims, rehabilitation, housing and distribution of life essentials are all part of this framework. The plan can be activated irrespective of the disaster origin or effect.

Reference documents

> [Contingency Plan, Waterboard van Delfland](#)