



# Dordrecht, Netherlands, the

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

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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.*

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## **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: 4

### Description of Progress & Achievements:

The municipality of Dordrecht has relatively much knowledge and experience in DRR for flooding and climate change adaptation. This knowledge and expertise has been obtained through active participation in the EU Interreg IVB project MARE and the sub-programme "Rhine Estuary Drechtsteden" of the Dutch Delta Programme. The deputy mayor of Dordrecht is a member of the Steering Group of the sub-programme "Rhine Estuary Drechtsteden", which ensures support at the political level -- as needed to effectively deliver DRR for flooding and climate change adaptation

The municipality of Dordrecht has developed and implemented a dedicated conceptual framework & assessment tool for DDR, which is termed Multi Level Safety (= protection, prevention and preparedness). The implementation of Multi Level Safety for the Island of Dordrecht is being addressed in a dedicated MIRT-study (Meerjarenprogramma Infrastructuur, Ruimte en Transport). The MIRT-study is a joint initiative of 4 local/regional governments (municipality, water board, province and safety region) and the central government (Ministry of Infrastructure and Environment). Adequate levels of human and financial resources are available to execute this study. The results will be delivered in October 2015.

The municipality of Dordrecht is working in close cooperation with other government bodies and knowledge institutes in order to realize an Expertise Network on spatial planning and water management (incl. DRR). In this Expertise Network, the various organizations involved cluster their knowledge and experiences from a range of recent and ongoing policy trajectories and (European) research projects.

### Related links



> [Delta Programme Rhine Estuary Drechtsteden](#)

## **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:

The municipality of Dordrecht is working in close collaboration with the Water Board Hollandse Delta. This cooperation has been successful since the establishment of the water board in 2005. Yet, recent austerity measures have presented difficulties for the collaboration, as these measures have led to silo behaviour -- meaning that the water board places greater emphasis on executing core tasks, with less room for experimentation with new tasks (e.g. spatial adaptation).

The cooperation between different public and private parties has significantly improved over the last 10 to 15 years, among other because the Island of Dordrecht has been the focal point of the EU Interreg IVB project MARE. Within the context of MARE, a Learning and Action Alliance has been established as a platform of stakeholders in flood risk management, so as to enable collective active learning. The public and private parties in the MARE LAA included the municipality of Dordrecht, Water Board Hollandse Delta, Safety Region Zuid-Holland Zuid, Ministry of Transport, Public Works and Water Management, Rijkswaterstaat (together with Deltares), UNESCO-IHE and Dura Vermeer.

It is intended to significantly increase the partnership with private sector in the coming years. Active involvement of the community exists (particularly for rainfall flooding), and the municipality has set out to engage local/regional companies in the innovation programme, as part of the EU Interreg IVB project CAMINO (Climate Adaptation Mainstreaming through Innovation). The thought is that local/regional companies will be interested in joining the implementation of the Multi Level Safety strategy.

### Related links

- > [EU MARE LAA Dordrecht](#)
- > [EU CAMINO LAA Dordrecht](#)

## **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: 3

#### Description of Progress & Achievements:

Societal organizations regularly organize evening meetings/workshops, in which discussion groups (formed by inhabitants) debate on various topics, including flood risk management. In the past, particularly elderly inhabitants took part in these discussions - but, nowadays, more and more young people join these meetings (particularly when there is a prospect for economical development).

The municipality is currently setting-up 2 City Labs on flood risk management, in which the community will participate in a more active way in decision making.

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

Level of Progress achieved: 5

#### Description of Progress & Achievements:

The municipality of Dordrecht is working in close cooperation with other regional governments (province, water board and safety region) and the national government within the framework of the Delta Programme Rhine Estuary Drechtsteden and the MIRT study Multilevel Safety. There is attention in the annual reports of National Delta Programme for a number of strategies being studied by Dordrecht, like the 'Multilevel Safety' concept and the concept of 'smart combinations' (Dutch: slimme combinaties).

#### Related links

> [Delta Programme Rhine Estuary Drechtsteden](#)

## 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.*

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

Level of Progress achieved: 4

#### **Description of Progress & Achievements:**

Flood risk management is not primary the task of the municipality, and the municipal budget for this task is limited. Other organizations play a much bigger role in flood risk management and emergency responses. Nonetheless, the municipality is spending a significant amount of resources on a number of close related tasks, such as sewer management and spatial planning.

The water board is responsible for the maintenance and upgrading of the flood defences (e.g. dikes and hydraulic structures), and has adequate financial resources to carry out these core tasks. Because the water board has just come out of a financial difficulty, they have limited resources available for integration with other elements (e.g. spatial planning and emergency management) that could potentially contribute to strengthening flood resilience.

The Safety Region Zuid-Holland Zuid also has enough budget for its core task, which is emergency management. Though additional financial resources are required for knowledge / information exchange with other Safety Regions. According to the Safety Region, it is wiser to invest in prevention through sustainable spatial planning (incl. e.g. protection of critical infrastructure) than in emergency management.

### **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: 3

## Description of Progress & Achievements:

The municipality has allocated sufficient financial resources for the programme Water. Yet, the main focus of this programme is on risk assessment and strategy development, and less on actual implementation.

As part of the strategy development, it has been considered how the implementation of the required flood risk management measures for the short- and medium-term can be linked with other spatial-economic developments and ambitions. The following opportunities for mainstreaming adaptation have been identified:

- Linking the tasking for the unembanked areas (Historic Port Area) with the required dike improvement of the Voorstraat. This is possible by building a new flood defence along the river Oude Maas to replace the existing dike. This new flood defence will consist of a floating barrier in the quays. Because this barrier will not be visible under normal circumstances, it will have little impact on the historical town centre.
- The water board has made an extra investment in safety with the improvement of the northeastern dike segment of the dike ring around in the Second Flood Protection Programme. This excess safety allows for the adoption of an extra stringent protection standard, without increasing the future tasking (up to 2050). This has made it possible to link the short-term tasking with the future tasking.
- The Ecoshape consortium, which is a collaborative body comprising the business community, knowledge institutions and government bodies, is conducting a study into the potential of green adaptation measures (building with nature) in Dordrecht. These measures could be implemented as alternative measures to address the safety tasking, such as for the maintenance and management of the foreland.

Limited allocations have been made (by the Delta Programme) for preparedness for response and recovery.

## Reference documents

> [Adaptation Measures and Pathways for Flood Risk in Dordrecht \(PAP014714\) \(2014\)](#)

**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 Dordrecht 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.

Households within the unembanked areas do not have access to this fund. Insurance packages will be made available to home owner-associations in the new built area Stadswerven.

### Related links

> [Flood insurance in the Netherlands](#)

### **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 to not be economically efficient. This is because of the relatively high flood safety standards in the Netherlands (including the Island of Dordrecht).

**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.*

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### **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: 5

#### Description of Progress & Achievements:

Advanced, complete and recent flood risk assessments exist for the Island of Dordrecht. On a national level, the current and potential risks of the various dike ring areas (incl. the Island of Dordrecht) are discussed in the government publication 'Deltaprogramma Veiligheid 2015'. Besides that, there is a dedicated document for the Rijnmond-Drechtsteden area (where Dordrecht is located). As part of this document, maps display the likelihood of flooding, the exposure level (water depth and minimal arrival time), the number of casualties and economic damage.

Besides these investigations at the national level, the MARE LAA and EU FP7 FloodProbe consortium also carried out significant research, for example on flood risk to critical infrastructure in Dordrecht.

#### Related links

> [Background report Water Safety Island of Dordrecht](#)

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

Level of Progress achieved: 5

#### Description of Progress & Achievements:

Realised losses due to flooding in the unembanked areas are systematically recorded (on an annual basis).

Statutory assessments of the flood defences 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 Regions Act requires the development of updated risk maps every 4 years.

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 synchronised with the Water Framework Directive (WFD) implementation cycle.

### Related links

- > [New water safety standards for the Netherlands](#)
- > [Risk maps](#)

## **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 Safety Region sends an information letter on (all-hazard) risks and risk reduction measures to the local community. This is done every 5 years.

The municipality sends an information letter on local flood risks and risk reduction measures to the inhabitants of unembanked areas. This is done on an annual basis.

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](http://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](http://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.

Other early warning systems are described under Essential 9.

### Related links

- > [www.onswater.nl](http://www.onswater.nl)
- > [www.overstroomik.nl](http://www.overstroomik.nl)
- > [www.watdoeje.nl](http://www.watdoeje.nl)
- > [www.nl-alert.nl](http://www.nl-alert.nl)
- > [https](https://)
- > [Risicowijzer](http://Risicowijzer)
- > [www.risicokaart.nl](http://www.risicokaart.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:

The risk assessments made for Dordrecht are part of regional- and national-scale risk assessments, which have been undertaken for the Dutch Delta Programme.

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

There is scope to improve the knowledge / information exchange with other Safety Regions.

#### Related links

- > [Administrative area of Safety Region ZHZ](#)
- > [Administrative area of Water Board HD](#)

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

Level of Progress achieved: 3

#### Description of Progress & Achievements:

Flood risk assessments are taken into account for local development planning in unembanked areas. The Province South Holland has developed a dedicated policy for this issue.

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.

Initial steps to better link spatial planning and flood risk management (in dike ring areas) have been taken by the Delta Programme Rhine Estuary Drechtsteden with the development of local development perspectives. This is being further explored in the MIRT Study Multi Level Safety.

The Safety Region has developed ample experience on the integration of DRR and spatial planning in the EU Interreg MISRAR project.

#### Related links

- > [Spatial development perspectives for Rhine Estuary Drechtsteden area](#)
- > [Watertoets](#)
- > [MISRAR project](#)

## Essential 4

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

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### **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:**

Given the nature of flood risk in the Netherlands (very small probability, large consequences), spatial planning regulations do not take account of flood risks. This is currently not considered desirable. However, as part of the MIRT study Multi Level Safety, new spatial planning regulation (e.g. flood zoning) is being investigated.

Flood risk assessments are taken into account for local development planning in unembanked areas. The Province South Holland has developed a dedicated policy for this issue.

Houses and energy boxes in the unembanked historical centre have been adjusted to be more resilient to flood risks -- either historically or in the recent past.

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

Level of Progress achieved: 3

## Description of Progress & Achievements:

The assessment of public facilities and critical infrastructure is well developed for External Security. This is concerned with the production, processing, storage and transport of hazardous substances. These assessments are updated every 4 years.

Preliminary risk assessment have been done for flooding, but this has not be translated into plans. In the context of the DPNH Experiment (Proeftuin) Self resilient Island of Dordrecht and the EU Floodprobe project, methods were developed and applied to study the vulnerability of critical infrastructure and its relation with flood risk assessments at various levels of detail: the storyline method and the quick scan for Quick wins for critical infrastructure protection. A storyline is a realistic sequence of incidents and human responses that may happen during a flood event.

### Reference documents

> [Flood risk assessment for Critical Infrastructure \(2013\)](#)

### Related links

> [EU Floodprobe report on Protecting Critical Infrastrcuture](#)

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

The environmental service (milieudienst) is encouraging companies to take temporary measures to reduce environmental risks (e.g. pollution) as a result of flooding.

Energy boxes in the unembanked city centre have been elevated to avoid damages.

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.

See Appendix 3 of the related link.

### Related links

> [Report Delta Programme 2015 \(see Appendix 3\)](#)

# Essential 5

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

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**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: 4

Schools	Yes
Hospitals/ health facilities	Yes

Description of Progress & Achievements:

Schools and hospitals/health facilities receive special attention in the risk assessments of the Safety Region. These objects are treated as vulnerable objects.

As part of the EU Interreg IVB project CAMINO, a business case is being studied that involves transforming the hospital/health complex (gezondheidspark) and the school complex (leerpark) into smart shelters. A smart shelter inhabits a building or part of a building and is designed to withstand the hazards associated with a flood event. A unique feature of a smart shelter is that it is a multi-use facility that can provide predefined functions before, during, or after a hazard event. The primary function of a smart shelter is that of an everyday building, the emergency shelter function is secondary.

Related links

> [EU FloodProbe report on Smart Shelters](#)

**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).

The GHOR (Regional Organization for Disaster Management) gives special attention to maintaining hospitals operational during disasters.

While the transformation of schools and hospitals/health facilities into smart shelters is being studied, no individual protection measures have been implemented to date.

### **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
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Hospitals/ health facilities Yes

### Description of Progress & Achievements:

A well-organised inspection system is in place to regularly assess schools and hospitals/health facilities for maintenance, compliance with building codes, general safety, weather-related risks.

Also, 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. The OSP does not specifically address flood disasters.

## Related links

> [OSP](#)

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

Level of Progress achieved: 4

Schools	Yes
Hospitals/ health facilities	Yes

## Description of Progress & Achievements:

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.

In 2013, a high-level interregional flood preparedness drill was undertaken in Dordrecht, 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 organisation knows and will act on its responsibility.

## 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.*

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### **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: 4

#### Description of Progress & Achievements:

Generally, new constructions are validated against municipal zoning plans, regulations and building codes. This is well arranged and enforced in the Netherlands.

### **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: 4

#### Description of Progress & Achievements:

Land use planning is well organised in the Netherlands, as is flood risk management. However, the connection between land use planning and flood risk management has to be improved.

Land use plans and building codes are currently not being used to reduce flood risks. If this is desired in the future, then the existing regulations are well placed to foster a culture of consequence reduction.

The Ministry of Infrastructure and Environment is participating in the MIRT study Multi

Level Safety with the objective to take away / modify any regulatory barriers for the implementation of Multi Level Safety (in particular for spatial planning and emergency preparedness).

For unembanked areas, the Province South Holland has developed a dedicated spatial planning tool that supports DRR for flooding.

# Essential 7

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

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

Level of Progress achieved: 3

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

### Description of Progress & Achievements:

The municipality of Dordrecht runs an environment and education center, named Weizigt. The goal of this organization is to raise the awareness among inhabitants of the environment (incl. water) and to provide environment & water education for society. Most education is concentrated on children who are attending primary or secondary school and is given in the form of workshops, debates and games.

Once a year, Weizigt provides education for secondary schools about water related issues, including flood risks.

As part of the Water Safety week, a game been organized for school children, in which they learned how to deposit sand bags in a quick and effective way. Besides learning how to do these actions, the children also developed awareness of water safety.

Weizigt also supports the organisation of inhabitant meetings on water related issues.

### Related links

> [Wiezigt](#)

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

Level of Progress achieved: 4

#### Description of Progress & Achievements:

Through 3-weekly meetings with the task manager Water, the deputy mayor receives on-the-job training on flood risk management. As such, the deputy mayor is well informed about available / efficient DRR options.

The staff across different municipal departments is (overall) well aware of the various options available for reducing and preparing for flood risk. This awareness has been built over the past 5-10 years by giving on-the-job training to e.g. spatial planners about DRR, for example in the case studies for the EU MARE project.

The aim of the programme Water 2015-2020 is to further raise awareness of the concept of mainstreaming DRR and climate change adaptation with other investment agendas.

#### **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:

In general, local schools and colleges pay attention to DRR and climate change adaptation in the curriculum.

The municipality of Dordrecht runs an environment and education center, named Weizigt. The goal of this organization is to raise the awareness among inhabitants of the environment (incl. water) and to provide environment & water education for society. Most education is concentrated on children who are attending primary or secondary school and is given in the form of workshops, debates and games. Once a year, Weizigt provides education for secondary schools about water related issues, including flood risks.

Many different bachelor and master courses related to geography etc. 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, Unesco-IHE and WUR are provided in the links related to this question.

#### Related links

- > [Utrecht University](#)
- > [Unesco-IHE](#)
- > [WUR](#)

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

Level of Progress achieved: 2

#### Description of Progress & Achievements:

Although an evacuation plan has been developed for the Island of Dordrecht, its content is not communicated in an active way to the inhabitants. The inhabitants can obtain information on how to act in case of a flood from a number of websites (see related links).

Communication is organised around the general disaster drill.

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

#### Related links

- > [www.onswater.nl](http://www.onswater.nl)
- > [www.overstroomik.nl](http://www.overstroomik.nl)
- > [www.watdoeje.nl](http://www.watdoeje.nl)
- > [https](https://www.ready2help.nl)
- > [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.*

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### **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: 4

#### 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 local government. This is because green adaptation measures provide a wide range of benefits to society and the environment, and typically enjoy a high level of public support.

The Ecoshape consortium, which is a collaborative body comprising the business community, knowledge institutions and government bodies, is currently conducting a study into the potential of green adaptation measures (Building with Nature) near Kop van t Land (northeastern dike segment). These measures could be implemented as alternative measures to address the safety tasking, such as for the maintenance and management of the foreland. Such green adaptation measures will deliver added value through a combination of nature development and safety.

#### Related links

> [Building with Nature Kop van t Land](#)

### **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	Yes
Fisheries	No

## Description of Progress & Achievements:

The local government is working to develop, manage, protect and restore new ecosystem services in the area.

The 'Nieuwe Dordtse Biesbosch' is one of the best examples of the local government's efforts in this field. As part of this large-scale project, a new wetland ecosystem will be developed in / adjacent to a natural park. The park's extraordinary polder structure, the dikes, the creeks, the river Nieuwe Merwede and the proximity to the city of Dordrecht make this area unique. The 'Nieuwe Dordtse Biesbosch' covers an area of about 530 hectare to be transformed into a wetland area, for which a significant amount of land has to be excavated.

Besides the municipality, organisations 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. Each couple of weeks, several activities are organised by the IVN for restoration of ecosystems. These activities are dependent on an active participation of the community, since all efforts are driven by volunteers. As an example; on 13 December an excursion was organised with the aim of topping off the willows along the river Wantij.

## Related links

- > [Nieuwe Dordtse Biesbosch](#)
- > [IVN](#)

## 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 like IVN and Natuurmonumenten react on this, and are actively involving citizens in the development and restorations of ecosystems.

For example, the neighborhood committee of 'Indische Buurt Noord' has started with the realisation of a green route between two parks (Merwesteinpark and Wantijpark). This project is entirely organized by citizens and it will form a green corridor between the two green spaces. This project has been set up by inhabitants and provides a motivation for other sustainable initiatives by inhabitants.

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

Level of Progress achieved: 2

## Description of Progress & Achievements:

The private sector is (modestly) participating in activities (e.g. workshops) regarding to environmental and ecosystem management plans in Dordrecht. In a workshop organised by Ecoshape for Kop van 't Land, a local company in the forestry sector has shown interest to economically exploit the willows envisaged in front of the dike.

## Essential 9

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

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**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 and municipality have sufficient resources (e.g. national or municipal funds) available (to prepare) for effective disaster response and early recovery.

**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:

The Water Management Centre at Rijkswaterstaat - Waterdienst (Lelystad) - has the responsibility 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.

This centre cooperates with KNMI (Royal Dutch Meteorological Institute).

Related links

> [Base line report for Rijkswaterstaat](#)

## How much do warning systems allow for adequate community participation?

Level of Progress achieved: 5

### Description of Progress & Achievements:

The last miles is very short, as the coverage of early warning systems is high in Dordrecht (and elsewhere in the Netherlands) -- almost all inhabitants will likely be reached.

A local early warning system is in place for the unembanked areas, which includes communicating via sound-cars, mailing services, websites and TV/radio. The local community is actively using these sources of information during high water situations. The municipalities of Dordrecht and Rotterdam have decided to improve this system by building a 'flood app', which will give more detailed/accessible information about high water levels and the required actions by affected households and individuals.

The warning system for the areas protected by the dyke ring consists of sound-cars and TV/radio. Here, 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).

The Safety Region addressed that in advance of a flood, energy companies will potentially shut down the energy supply in order to reduce the amount of damage to the electricity facilities (and shorten the recovery time). This will cause a shutdown of all ITC-facilities (television, mail service etc.), which reduces communication possibilities significantly. Nevertheless, radios and smart phones are still seen as stable communication platforms since they will connect to sensors which transcend the local area.

### Related links

> [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: 4

## 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 Regions).

The local government (Safety Region South-Holland South) has a new and modern regional crisis center on location Leerpark. It should be noted that this location is at risk of flooding.

Besides that, the Water Board Hollandse Delta has an agreement with a call center in order to communicate the ongoing risk to citizens by phone.

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

## **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 was undertaken in Dordrecht, 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-squat. The main goal of this drill was to divide the different tasks efficiently between the different organizations, so that each organisation knows and will act on its responsibility. An example of one of the drills organised for this project was the drill in Korendijk on 7 November 2013.

In 2008, a specific drill for flooding in the area South-Holland South was held, which simulated a dike breach in the neighbourhood of Vianen and Leerdam.

Drills with the dike army, a team of 900 people who are patrolling on the dikes during a storm to search for weak places, are regularly organised by the Water Board Hollandse Delta.

The Safety Region stated that the most important criterion to assess in any drill (not just for flooding) is if the framework is efficient. When a framework is functioning adequately, it can be applied to different types of disasters.

#### Related links

- > [Drill of dike army](#)
- > [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: 3

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) are being distributed during high water situations in the unembanked areas and a contingency plan for such situations is in place.

A contingency plan (Dutch: Regionaal Basisplan Overstromingen) has also been developed for the areas protected by the dike ring. However, this plan focuses on a large-scale preventive evacuation to other areas. In practice, only 10-25% of the affected individuals will be able to evacuate off the Island, because of the short lead time for warnings and the limited capacity of the road network (only 1 bridge to safer areas). No contingency plan has been developed, nor are any key resources available, for the remaining 90-75% of the affected individuals, who have to evacuate on the Island itself. The regional partners on the Island of Dordrecht have the ambition to develop a new contingency plan in which these gaps are being addressed.

The Safety Region ZHZ has learned from experience (e.g. from WODC study and EU

FP7 PREDICT) that it is not effective to assign specific evacuation routes, since a flood event could easily take out the major routes and some situations (e.g. weak dike, heavy storm) don't allow enough time for preventive, horizontal evacuation. Before an actual flood happens, the local/regional governments cannot know where a breach will occur, at what time (day/night) and with what speed the water will enter the dike ring. More attention has to be given to identify and implement proper evacuation routes for nearby evacuation.

It is being investigated whether agreements with national supermarket companies could be made to deliver food supplies in case of a disaster.

### Related links

- > [Instruction movie sand bagging](#)
- > [Stock piles of sand bags](#)

# 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.*

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## **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 Dordrecht 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:

- 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](#)

## **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.

Planning for recovery from flooding is not well developed in the Netherlands.

### 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: 2

## Description of Progress & Achievements:

The Water Board Hollandse Delta has prepared a contingency plan with a dedicated chapter on recovery and rehabilitation. Here, a framework is presented on how the area can recover as fast as possible. For example, the water board will set up a special team to coordinate recovery activities. In this plan, the tasks of the team have been stated, e.g. to deliver sufficient temporary facilities (like emergency pumps), to assess if recovery is needed, to distribute the responsibilities, etc. However, the chapter is rather small and not much attention is paid to efficient recovery in case of a large scale flood.

Recovery is an important point of attention for the recently started MIRT Study Multi Level Safety Island of Dordrecht.

Critical Infrastructure providers have developed a guideline and are taking measures

to improve the recovery of infrastructure networks after a disaster.

## Related links

> [Contingency plan WSHD](#)