Programmes

National Assessment Report (LRT) primary flood defences (1996-2006)

Flood Protection Programme 2

2005 2010 2015 2020

Budget

2.7 Billion

87 Projects

completed ongoing projects

Objectives
- Reinforcing 362 km of dykes, dams and dunes
- Reinforcing 18 hydraulic structures

Room for the River

2005 2010 2015 2020

Budget

2.4 Billion

39 Projects

completed (including 5 cancelled)

Objectives
- Flood risk management: by river enlargement, reducing design water levels
- Improving spatial quality

Zand- en Grensmaas

2005 2010 2015 2020

Budget

558 Million

55 Projects

Objectives
- Flood risk management for the river Meuse
- Improving spatial quality
- Financially self-sufficient project by means of mineral extraction

LRT (2011/2013)

Flood Protection Programme 2014-30

2005 2010 2015 2020

Budget

4.9 Billion

50/50 Government / Water board

943 km dykes

468 hydraulic structures

Objective
- Improving primary flood defences

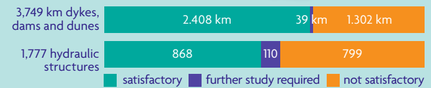
Failure mechanisms that prevent flood defences from meeting the standard

all amounts are expressed in euros

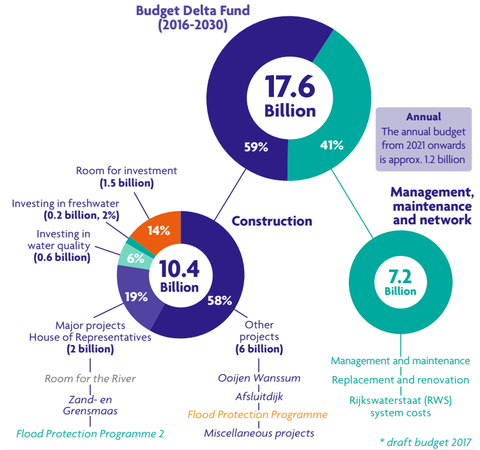
Projects

Ongoing projects
- Flood Protection Programme 2
- Room for the River
- Zand- and Grensmaas
- Flood Protection Programme
- Cross-project exploration for piping, Wadden Sea dykes, Central Holland and Overijsselse Vecht

Assessment results 2011/2013



Finances*



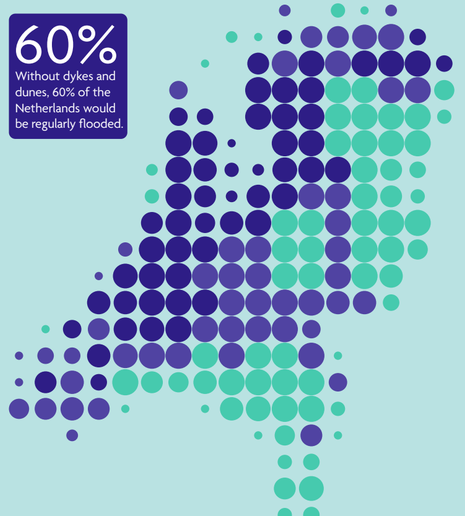
** draft budget 2017*

Financiën in 2017

Budget: 1.1 billion
- Construction: 0.6 billion
  - Major projects : 370 million
  - Other projects : 160 million
  - Water quality : 26 million
  - Freshwater: 39 million
- Management, maintenance and network: 0.5 billion

Flood risk management

60%
Without dykes and dunes, 60% of the Netherlands would be regularly flooded.



facts about our water

Flood risk management policy

Tolerable individual risk

The probability of an individual dying as result of flooding from a sea or river may not be higher than 1 in 100,000 a year.

Additional protection

If a flood results in major social disruption, such as a large number of victims or major economic damage, the area receives additional protection.

Examples

- A large number of victims: Alblasserwaard
- Major economic damage: Wageningen (Grebbedijk)
- Natural gas installation in Groningen
- Nuclear power plant in Borssele

Risk calculation

This takes into account both the probability of floods and the consequences of a flood. The consequences of a flood determine the flood risk that is deemed acceptable.

Flood defence systems

There are some **3,400 km** of dykes, dams and dunes in the Netherlands that provide protection against the sea, major rivers and lakes. These are the primary flood defences. They are largely managed by the regional water boards. The Central Government (RWS) manages approx. **250 km** of these.
The approx. **14,000 km** of regional flood defences, such as storage basin dykes and dykes along regional rivers, are also managed by the water boards. A little under **500 km** is managed by RWS. Along the major rivers, RWS manages approx. **3,800** hectares of flood plains, some 10% of the total surface area.

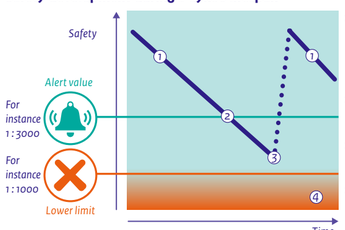
Safety and lifespan of dykes

Safety assessment

There is still ample time to reinforce the dyke to continue to meet the agreed protection level.

The periodical assessment by the national government will issue an alert if the government needs to take action.

Safety development during a dyke's lifespan



1. *Safety decreases due to increasing water levels (due to climate change) and decreasing dyke strength (due to aging).*
2. *Preparations can start as soon as the alert value has been reached.*
3. *Before the lower limit is reached, reinforcement of the dyke starts.*
4. *Below the lower limit, the agreed standards are no longer met.*

Afsluitdijk (IJsselmeer Closure Dam)

The dyke embankment of the IJsselmeer Closure Dam (1932) is 30 km long and some 90 metres wide. The dyke no longer meets the standard and will therefore be reinforced in the period from **2017 until 2022**. It will be rendered resistant to wave overtopping along its entire length. Pumps in the discharge complex at Den Oever serve to increase the discharge capacity of the IJsselmeer Closure Dam. The budget for these measures is **EUR 869 million**.
At Kornwerderzand, a fish migration channel is being dug for migratory fish such as eel, smelt, whitefish and salmon. Construction will cost **EUR 55 million**.

The coast

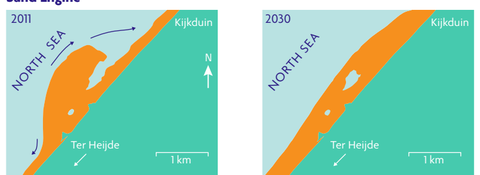
Coastal replenishments

The Dutch coast protects our country against the sea. To maintain that level of protection, RWS applies some **12 million m³** of sand every year, a quantity enough to fill De Kuip stadium in Rotterdam to the brim eight times over.

8 million m³ for maintenance of basic coastline

4 million m³ to allow the coast to rise at a pace with the sea level

Sand Engine



The Sand Engine is an innovative way of protecting the coast using nature itself. It was constructed in **2011** between Ter Heijde and Kijkduin as a **128-hectare** peninsula (256 football pitches). Wind, waves and current will spread the sand along the coast over the next twenty years. For its construction, **21.5 million m³** of North Sea sand was used. Since its construction, **3.5 million m³** of sand has moved, more than half of which to the north. Construction cost **EUR 70 million**.

Facts about the coast

The coast is **523 km** long, of which 353 km is North Sea coast (incl. 254 km with dunes), the rest is located along the Wadden Sea and the Westerschelde.

In recent years, the coast has been reinforced where this proved necessary. Where possible, this reinforcement was combined with other functions, such as a car park in a dyke at the foot of the dunes in Katwijk. To reinforce the Hondsbossche en Pettemer Zeewering, a 5-km long dune comprising approx. **30 million m³** of sand has been deposited.

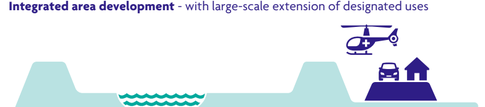
Improvement options

Incorporation - e.g. dyke reinforcement, taking into consideration existing use

River widening - instead of dyke reinforcement

Linkage - with limited extension of designated uses

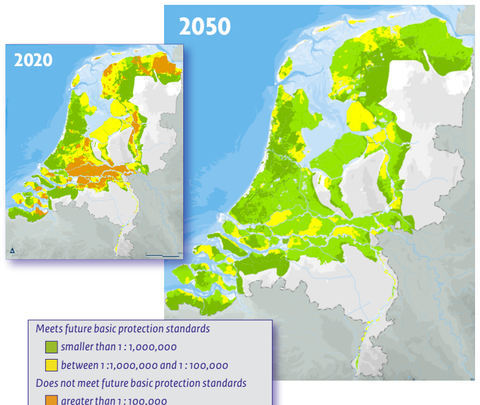
Integrated area development - with large-scale extension of designated uses



Other combinations - measures in spatial development and/or emergency response can also ensure protection (against flooding)

Protection in 2050

Probability of dying as result of flood



Ministry of Infrastructure and the Environment
Directorate-General for Spatial Development and Water Affairs
Water Policy and Safety department

For more information, go to
www.government.nl/topics/water-management
www.destaatvanonswater.nl

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