Room for the Rivers Programme

Cost of Flood Protection Measures in The Netherlands

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Content

- The Dutch delta
- Flood Protection in the Netherlands
- Room for the River
- Examples of measures and Costs
Flood prone areas in the Netherlands

Netherlands
- total surface area 36,000 km²
- inhabitants 16 million

North Sea

Netherlands
Belgium
Germany

- Higher lands
- Flood prone areas
Catchments of rivers Rhine and Meuse

Discharge at Lobith (border with Germany):
- average: 2,200 m$^3$/s
- top: 12,000 m$^3$/s
- peak: 16,000 m$^3$/s (1/1250 per year)
Lay-out of the Dutch rivers

Room for the Rhine branches
Dike ring areas / safety levels

~Established after the floods of 1953

~The safety level of the inland river area is 1/1250 per year
In time less space for the river
Area of Floodplains decreased
High water levels are a wake-up call and flooding remains a threat:

~ High water levels in 1993 and 1995
~ 200,000 people evacuated
~ Climate change is ongoing
Main elements of our flood protection policy

Room for the River

Preservation of the current space

Damage control
Objectives of Room for Rivers

1. Safety
   “Improving flood protection in the Rivers Region up to the required level”

2. Spatial quality
   “Contributing to improving the spatial quality of the Rivers Region”
The planning area Room for the River

~5 Provinces
~12 Waterboards
~60 municipalities
~725 km dikes
~3 ministeries
Safety: Room for Rivers Programme

~ Basic package of about 40 measures
~ Location and type of measures established
~ Further elaboration in planning phase
~ Standard: 16,000 m³/sec at Lobith in 2015
~ Investment of EUR 2.2bn
Basic Package flood protection works (2015)
Measures

- Relocate dyke
- Side channel
- Lower level of floodplain
- "Green river"
- Reduce height of groynes
- Remove obstacles
Town of Nijmegen
Dike re-location
Examples of measures

Dike relocation Bakenhof
Cost: Euro 6.5 million
Hondsbroeksche Pleij
Cost: Euro 45 million
Examples of measures

Lowering of river foreland
Examples of measures

De-poldering
Overdiepse polder
Railway bridge Oosterbeek
Cost: Euro 45 million

Removal of hydraulic obstacle: replacement of railway dike by bridge.
Examples of measures
Lowering of the groins
Examples of measures

Flood bypass

Veessen - Wapenveld
Cost estimates for measures

~Lage-scale dike relocation: Euro 350 – 400 million

~Dike relocation: Euro 25 – 70 million

~Lowering of groynes: average Euro 120,000./groyne

~Quay lowering: Euro 2 million
Cost estimates for measures

~Floodplain excavations: Euro 10 – 50 million

~Obstacle removal: Euro 8 million

~Green river bypass: Euro 190 million

~Summerbed lowering at Lower IJssel: Euro 65 million
Costs

~Spatial Planning Key Decision: Euro 40 million
   2000 - 2006

~Detailed Planning: Euro 180 million
   2006 - 2010

~Implementation of basic package of 40 measures: Euro 2.0 billion
   2007 – 2015
Upper Rhine/Waal, Pannerden Canal

Waal

Lower reaches of the rivers

Lower Rhine

River IJssel

Sub-total

Administrative choices

Project unforeseen (technical)

Total

Basic Package flood protection works (2015)

Upper Rhine/Waal, Pannerden Canal

Waal

Lower reaches of the rivers

Lower Rhine

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Sub-total

Administrative choices

Project unforeseen (technical)

Total

Cost estimate for the basic package of Measures

Upper Rhine/Waal, Pannerden Canal

Waal

Lower reaches of the rivers

Lower Rhine

River IJssel

Sub-total

Administrative choices

Project unforeseen (technical)

Total

Cost estimate for the basic package of Measures
Otherwise, this might be our future.

The implementation of the measures will have to be finished in 2015.
Thank you for listening!

For more information: www.ruimtevoorderivier.nl