

The costs of natural disasters under climate change

Increasing frequencies of extreme weather events are expected to cause more losses from weather disasters. The interplay between hazards, and vulnerability and exposure, make reliable estimates of the actual risks difficult. Climate change will increase losses, but increasing exposure and value of capital are expected to be more important.

The project A09 “Financial arrangements for disaster losses under climate change” within the Climate changes Spatial Planning programme has identified impacts from climate change on disaster losses and the role of insurance arrangements in the

Netherlands. The project investigates whether current financial arrangements for damage caused by extreme weather are sustainable and economically efficient. The project develops and evaluates alternative insurance arrangements in order to adapt to changing risks^[1]. The role of insurance is discussed more in-depth in a separate article on page 41 (Botzen & Van den Bergh)

The analyses of future potential losses performed in this project, include historic data, loss modelling, and scenarios for climate and socio-economic change. Among these analyses are projections for hail storm losses, casualties due to flooding^[2], and economic losses from flooding. Projections of future flood losses (Figure 1) in a case study area along the River Meuse in the Netherlands vary considerably, depending on the assumed climate scenario (KNMI ’06 scenarios G and W+) and scenario for socioeconomic change (WLO scenarios Regional Communities; RC, or Global Economy, GE).

Taking into account only the increasing exposure and value increases of assets (socio-economic change) annual expected losses by the year 2040 are projected to increase by between 35% and 172%, compared to the baseline situation in the year 2000. Looking only at the effects of climate change, annual expected losses increase between 27%

and 148%. A combination of climate and socio-economic change amplify each other, and may increase losses up to 71% and 575%.

In this case study, the effect of climate change is found to be of approximately equal magnitude as socio-economic change^[3]. However, adaptation through reduction of flood probabilities is likely to severely reduce the contribution from climate change. Considerable uncertainties remain and more studies are required to quantify the precise role of exposure, vulnerability and climate change^[4].

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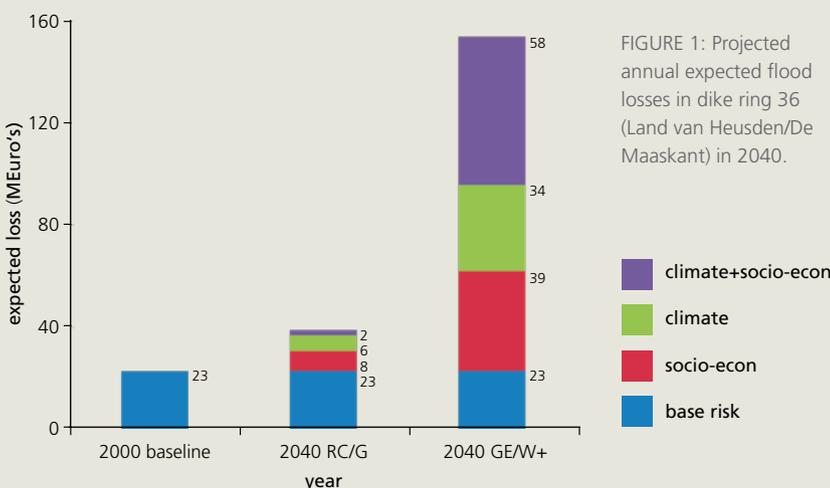


FIGURE 1: Projected annual expected flood losses in dike ring 36 (Land van Heusden/De Maaskant) in 2040.