Measuring climate change adaptation case studies: Impacts of unusual weather on the Gross Domestic Product in the Netherlands

Country	Netherlands
Short description	Unusual weather deviates from long-term average weather. Examples are not only cold winters and hot summers, but also heavy rainfall or (hail) storms. The frequency of unusual weather events may change in the nearby future. The GDP quarterly time series, at sector level, are normally corrected for average seasonal effects, but the impact of unusual weather on the GDP is still not clear. An ARIMA-model is used to estimate such impact. The research shows that some sectors profit from unusual weather, some don't, and some are at risk when the frequency of unusual weather increases. The obtained results are not mature. More (academic) research is needed. The results from 2014, and updated in 2020, should be seen as an inspiring first exercise.
Keywords	
Thematic area	• **Energy** • **Mining, manufacturing and construction** • **Production and consumption patterns**
Type of statistical product or activity	• **Data analysis** • **Modelling impact**
Adaptation approaches	• **"Soft" adaptation – policy, legal, social, management and financial measures**
Concepts measured	• **Impacts**
Hazard type covered	• **Cold wave** • **Heatwave**

Description of the statistical activity

The outputs were: research report (2014) in English and update (2020) in Dutch.

The activity It is relevant in the context of climate change adaptation, since it shows that unusual weather has both positive and negative effects on economic growth (GDP). Adaptation measures should not only be focused on sectors at risk (minimizing damages), but also on sectors that profit from unusual weather (maximizing economic opportunities).

Conclusions:

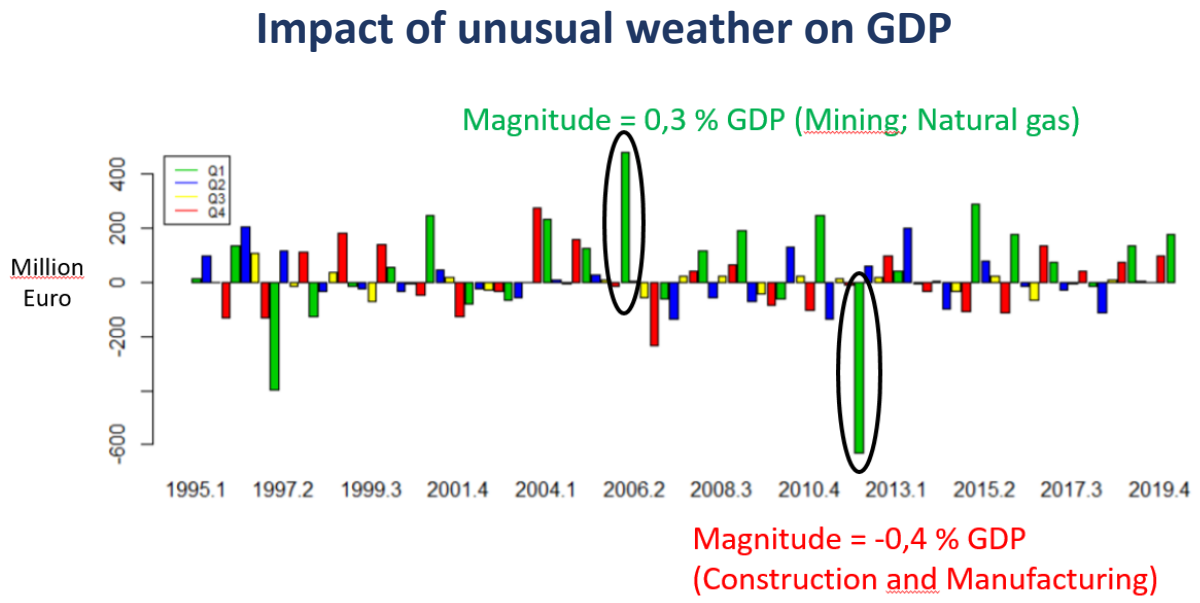
- Cold weather increases heating needs (significant effect on Mining and Energy sectors)
- Severe frost hinders activities (significant effect on Construction and Manufacturing)
- Warm weather leads to a sunny 'going out' mood (significant effect on Accommodation and food service activities).

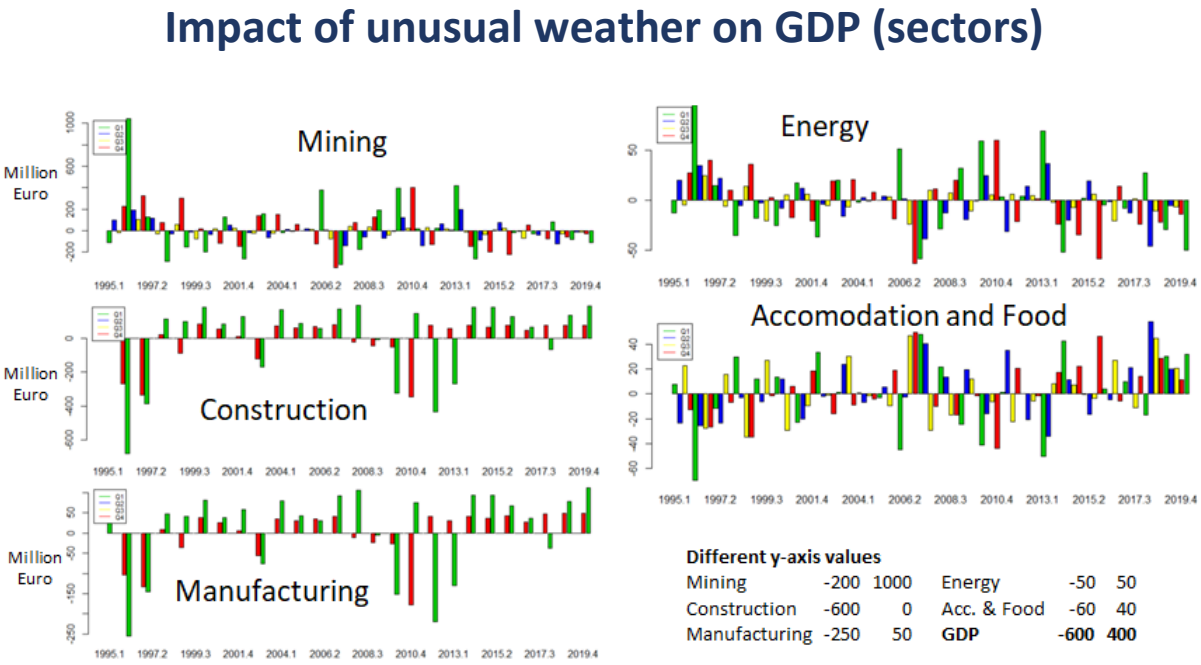
Additional research is needed. At the moment no budget is available to continue this research.

Stakeholders and partners

The research was done by Statistics Netherlands and financed by Ministry of Infrastructure and Water Management (as part of the National climate adaptation strategy).

Example of outputs





More details

Data sources used	Daily weather indicators from Royal Netherlands Meteorological Institute (KNMI) and National Accounts data (GDP, sectors, quarterly) from Statistics Netherlands.
Frequency	One time activity (2014) and an update (2020).
Coverage (national/subnational)	National
Links with the results and more information	Research report (2014; English) Update (2020; Dutch) National climate adaptation strategy
References and bibliography	Relevant references to methodology can be found on page 21 of Update (2020; Dutch).
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