

Report

Impact of Climate Change on Non-Life Insurance

Points of attention for consumers and
entrepreneurs

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1 Introduction

Extreme weather related to climate change is one of the main causes of damage and losses. Between 2000 and 2016, the top five of loss events covered by consumers' buildings and home contents insurance in the Dutch Association of Insurers' top 25 consisted solely of those caused by storm, hail or heavy rain. Worldwide, damage and losses caused by natural disasters totalled USD 190 billion in 2020, USD 81 billion of which was insured.¹ In the Netherlands, damage and losses caused by extreme weather related to climate change totalled EUR 296 million.² As such, climate-related loss events are one of the biggest cost items for non-life insurers.

Damage and losses caused by climate change are mounting. Although the annual figures vary, the average annual amount in damage and losses caused by disasters (the main subcategory of which is formed by natural disasters) is increasing worldwide. In the 1970s, the average amount in damage and losses caused by disasters totalled around USD 25 billion per year; in the past 10 years, it totalled USD 222 billion per year.³ Adjusted for economic development and inflation, damage and losses due to natural disasters annually increased by 1.3%.⁴ This is partly due to climate change, which increases the incidence of extreme weather conditions (which is reflected by the strong increase in storm damage).⁵ Consequently, damage and losses due to extreme weather related to climate change are expected to keep increasing. The Dutch Association of Insurers, having analysed various scenarios, forecasts that by 2085, in the most extreme scenario, the annual cost of climate-related damage and losses will have increased by EUR 250 million compared to 2017.⁶

In the Netherlands, too, we have seen examples of major damage and losses due to extreme weather. In 2016, a single hailstorm caused EUR 600 million in damage and losses.⁷ In 2020, storm Ciara caused EUR 84 million in damage and losses. While the total cost of the damage and losses due to the recent flooding in Limburg has not been established yet, it is likely to be several hundreds of millions of euros.⁸ While no direct link can be established between climate change and any single extreme weather event, climate change clearly increases the likelihood of such extreme weather conditions.⁹

In many cases, climate-related losses are not covered by insurance. In 2020 alone, uninsured damage and losses due to natural disasters totalled USD 109 billion worldwide.¹⁰ Weather-related risks are difficult to insure against. Damage and losses caused by extreme weather may be fully or partly excluded from insurance cover, and even when they are covered, complex conditions and exemptions may apply. Following the flooding in Limburg, some insurers pledged to pay out non-covered claims, whereas some entrepreneurs were faced with the fact that their insurer refused claims which they had expected would be paid out.^{11 12} It is expected that consumers and businesses will be confronted with these types of damage and losses more often due to climate change. Furthermore, as a result of climate change, certain types of damage and losses may be excluded from insurance cover in the future. Therefore, consumers and entrepreneurs will need to be prepared for this by creating financial buffers and taking preventive measures. This also raises the question

¹ [Swiss Re, 2021](#)

² [Dutch Association of Insurers, 2021](#)

³ [Swiss Re, 2021](#)

⁴ [Swiss Re, 2021](#); this figure has been adjusted for inflation and normalised (which means that the figure takes into account that due to the greater size of the economy, the same type of natural disaster causes higher losses today than in 1970).

⁵ [Swiss Re, 2021](#)

⁶ [Dutch Association of Insurers, 2017](#)

⁷ [Royal Netherlands Meteorological Institute \(KNMI\), 2016](#) and [Dutch Association of Insurers, 2021](#)

⁸ [Dutch Association of Insurers, 2021](#)

⁹ [KNMI, 2021](#)

¹⁰ [Swiss Re, 2021](#)

¹¹ [Nu.nl, 2021](#)

¹² [Algemeen Dagblad, 2021](#)

what steps the government and insurers can take to ensure that certain types of risks are insured against or insurable. This report addresses those questions.

Reader's guide

In section 2, we will explain why climate-related damage and losses are a complex risk category that cannot always be insured against. In section 3, we will give concrete examples of extreme weather events and of the conditions that determine whether certain types of property are insured against damage due to such events. In section 4, we will draw conclusions and make recommendations.

This report focuses on climate-related property damage incurred by consumers. We will only take a cursory look at the business market and the impact of climate change on the investment side of the insurance industry.

2 Background to insurance against climate-related risks

2.1 Insurability against climate-related risks

Insurance is based on the principle that a group bears the cost of losses incurred by individuals in the event that certain risks materialise. Insurance is only effective when the likelihood of risks and the impact (i.e. size of losses) can be adequately quantified, when the risks occur independently of each other (i.e. are uncorrelated), and when the insurance covers a sufficiently large risk pool. When the likelihood and impact cannot be adequately quantified, it is impossible to calculate fair premiums. When risks are correlated or the risk pool is not large enough, premiums will be too high and insurance will thus offer no added value to consumers. Therefore, it is not possible to insure against all types of damage and losses.

This means that insurability against damage and losses related to climate change cannot be taken for granted:

- **The likelihood and impact of climate-related loss events are difficult to estimate.** Natural disasters and other climate-related loss events have a big impact but occur infrequently. Consequently, their likelihood and impact can be quantified only to a limited extent. In addition, there are many different types of climate-related damage and losses. Insights into certain types of damage and losses do not necessarily apply to other types. Furthermore, as the climate keeps changing, previously found correlations may no longer be valid and novel risks may emerge. This high degree of uncertainty as to the likelihood of climate-related loss events complicates the calculation of premiums, making it difficult to offer insurance against climate-related risks. This uncertainty also applies to the impact of climate-related loss events.
- **At the same time, the cost of climate-related loss events is often huge.** Climate-related loss events can have a huge impact on many policyholders at the same time (as such risks are not independent of each other but correlated), such as in the event that a dyke bursts and a large part of the Netherlands is flooded. This impedes the effectiveness of insurance against such risks. Following such an event, insurers may struggle to bear the high cost of the insurance claims. If the total cost of the insurance claims is high enough, this could jeopardise an insurer's continued existence. Therefore, to ensure proper financial planning for such potential large loss events, it is vital for insurers to be able to quantify their exact impact, but that is complicated for climate-related loss events.

2.2 Consequences of limited insurability

As a result of these inherently complex insurance dynamics, certain risks are partly or wholly uninsurable. It is impossible to offer affordable and comprehensive insurance cover for certain climate-related risks. Consequently, certain risk categories are partly or wholly uninsurable.

Moreover, there are big differences between insurers and detailed policy conditions apply. In order to be able to offer insurance against such risks while controlling their own risk exposure, insurers may apply detailed and complex policy conditions, including specific conditions (such as exclusions, limitations or specific prevention requirements) applying to specific causes and types of damage and losses. This may also present consumers with specific insurance terminology designed to distinguish between different causes and types of damage and losses, or with specific certification requirements with a view to preventing property damage. Each insurer can make its own choices in terms of weighing up risks and costs, resulting in major differences between the policy conditions of different insurers. Therefore, these policy conditions should be transparent and comprehensible to consumers.

The uncertainty associated with climate change may also lead to insurers abruptly raising premiums and introducing stricter policy conditions. The uncertainty associated with climate change may lead to the occurrence of unexpected types of damage and losses or unexpectedly high losses. Therefore, following a major climate-related loss event, insurers may be forced to abruptly introduce stricter policy conditions or to impose restrictions in their claims handling in order to limit the total amount paid out in future claims.¹³ For example, some insurers have decided to no longer provide cover for (invisible) hail damage to solar panels (see also section 3.1), and all insurers have stopped providing cover for property damage due to subsidence (see also section 3.3). Over time, as insurance claims for property damage continue to mount due to climate change, more of such restrictions may follow.

2.3 Risks to consumers

As a rule, consumers have to bear the cost of uninsured property damage. As a rule, consumers are financially responsible for any property damage they incur. The cost of such property damage is expected to increase due to climate change. Consumers can plan for this financially through a combination of taking out insurance, preventive measures and creating a financial buffer. This requires that consumers take into account the various elements of this financial planning, such as by creating a sufficient financial buffer and carefully checking what is and is not covered by their insurance (including regularly checking for changes in policy conditions, such as exclusions). In addition, the government provides a safety net in the form of the Disasters (Compensation) Act (*Wet tegemoetkoming schade bij rampen*). The primary purpose of the Act is to provide relief in case of large-scale damage and losses due to the flooding of watercourses and earthquakes, but it can also be used for other types of disasters. However, any relief paid out under this Act does not cover the full cost of the actual damage and losses incurred. Moreover, this relief only applies to damage and losses that were not reasonably insurable, and it is impossible to precisely predict which types of damage and losses will qualify for it. Therefore, consumers have no certainty as to what relief they can expect to receive under this Act, and therefore cannot rely on it in their financial planning. Hence, the government's safety net does not remove the need to take out insurance (nor is that its purpose).

¹³ This risk is partly due to the fact that insurers appear to have priced in the risk of future climate-related loss events only to a limited extent, and therefore may be confronted with increases in their cost of claims ([EIOPA, 2020](#)).

3 Concrete points of attention

Climate change increases the likelihood of extreme weather, and thus the likelihood of property damage. The Netherlands is primarily faced with an increasing likelihood of extreme precipitation, particularly hail, thunderstorms and flooding. Furthermore, increasing drought can cause subsidence. This affects the cover under various types of non-life insurance policies, such as car insurance and buildings and home contents insurance. Below, we discuss the main points of attention for consumers when it comes to the cover provided by non-life insurance.

3.1 Precipitation

Climate change is predicted to increase the amount of precipitation, and in particular the incidence of extreme precipitation. Average annual precipitation increased in the past century, and all climate change scenarios predict a further increase.¹⁴ Moreover, the incidence of extreme precipitation, including extreme hailstorms, is also predicted to increase, which is a key factor in the likelihood of property damage.

Precipitation can cause property damage in various ways. Property damage caused by precipitation includes damage due to rain, snow, hail and meltwater. In terms of insurance cover, this property damage breaks down into two types: direct and indirect damage. Direct damage is damage caused by precipitation that falls on a building, or by water flooding into a building from an adjacent street due to heavy rainfall. Indirect damage is damage caused by the flooding of ditches and canals due to heavy local rainfall (in insurance terms, this is regarded as distinct from damage due to flooding caused by precipitation that fell elsewhere, see section 3.2). In addition, periods of heavy precipitation can sometimes trigger a rise in groundwater level.

Property damage incurred by consumers due to precipitation is usually covered. Buildings insurance and car insurance policies usually cover direct and indirect damage due to precipitation. In buildings insurance policies, often a distinction is made between direct and indirect damage, whereby the cover for indirect damage is often subject to special conditions. However, damage caused by rising groundwater seeping through basement walls is usually not covered and it is difficult to take out comprehensive insurance against this. Insurance policies for entrepreneurs are often customised products and do not automatically cover damage or losses due to precipitation.

Limited cover for damage to solar panels due to precipitation is a key point of attention. The number of solar panels in the Netherlands is rapidly increasing.¹⁵ Damage to solar panels is usually covered by buildings insurance and sometimes by home contents insurance. Most buildings insurance policies provide some form of cover for damage to solar panels. Two types of damage and losses are less commonly covered, particularly since 2016, when there was widespread hail damage: micro cracks in solar panels,¹⁶ and loss of income. Micro cracks may develop during the production process, but may also develop when solar panels are installed, or during an extreme hailstorm. Micro cracks in solar panels can cause consequential damage or losses, such as losses incurred because less power is generated, and can also increase the risk of fire. As these types of damage and losses are less commonly covered, consumers often have to bear the associated costs themselves. Given that such damage and losses will occur more frequently in the future, due to climate change and the growing number of homes with solar panels, consumers need to be aware of this risk.

¹⁴ [KNMI, 2014](#) and [KNMI, 2021](#)

¹⁵ [CBS, 2019](#)

¹⁶ These are microscopic fractures in the solar cells that are invisible to the naked eye.

3.2 Flooding

The risk of flooding is also increasing. In the period from 2000 through to 2012, the average annual amount in damage and losses incurred due to flooding for the EU as a whole came to EUR 4 billion. It is estimated that this will have increased to EUR 23 billion per year by 2050. EIOPA has calculated that the Netherlands is among the EU member states with the highest risk of damage and losses due to flooding.¹⁷ How the actual risk develops will depend in part on the preventive measures that are taken, such as strengthening dykes.

In terms of the insurance cover for flooding, a distinction is made based on the cause of the flooding. As discussed above in section 3.1., damage to buildings caused by the flooding of adjacent streets and ditches due to heavy local rainfall (which is usually covered for consumers) is regarded as distinct from damage due to flooding caused by precipitation that fell elsewhere. Not all flooding is caused by local precipitation. Precipitation in higher areas upstream can lead to rivers flooding their banks downstream in lower lying areas, which in the worst-case scenario of a dyke breach can lead to a major flood disaster. In this respect, insurance policy conditions distinguish between the failure of primary flood defences (such as those along the Rhine and Meuse and on the North Sea coast), which is never covered and wholly uninsurable, and the failure of secondary flood defences (along smaller, regional watercourses), which may be covered under specific insurance policies.

Damage due to flooding not caused solely by local precipitation is not always covered. Not all insurers offer buildings and home contents insurance that covers the risk of damage due to flooding. Where such cover is offered, it usually only covers damage caused by 'local' water from rivers, lakes, ditches and canals. In the absence of insurance cover, the costs of this damage must be borne by consumers. Furthermore, they face uncertainty, as the distinction that applies between 'local precipitation' (which is usually covered) and 'non-local precipitation' (which is not always covered) is not always clear.

Consumers appear to be insufficiently aware that they are not insured against this risk.¹⁸ 40% of the consumers in a survey conducted in this context wrongly assumed that their insurance covered property damage caused by flooding. This can lead to major disappointment and have a big social impact when such damage occurs.

3.3 Drought

The likelihood of periods of drought will increase due to climate change. Periods of drought can lead to a drop in groundwater level, rivers carrying less water, and damage to dykes.

Subsidence and collapse of homes due to drought is a major type of property damage. Periods of drought can lead to a drop in groundwater level. Where the soil includes a peat and/or clay layer, a drop in groundwater level due to drought can trigger subsidence, which can lead to cracks in walls and façades, and also increases the likelihood of wooden foundations being degraded by pile rot. Pile rot can lead to subsidence and in the worst case to the collapse of homes. According to a report by Ecorys commissioned by the Ministry of Infrastructure and Water Management, an estimated 800,000 homes in the Netherlands are at risk of pile rot, with the average estimated cost of the damage amounting to EUR 64,000,¹⁹ adding up to a total estimated cost of over EUR 51 billion.

¹⁷ [EIOPA, 2020](#)

¹⁸ [Dutch Association of Insurers, 2017](#)

¹⁹ [Ecorys, 2019](#)

The risk of the subsidence and collapse is uninsurable. This risk cannot be insured against. Whereas several insurers still offered insurance cover against this risk in 2016, currently no insurer offers such cover. Therefore, consumers will have to bear the cost of such property damage. Given the big cost and major impact of such damage, consumers need to be aware of this risk and they need to personally take measures where necessary. As the subsidence risk for any given home can be predicted with reasonable accuracy, consumers can take this into account when buying a home or when planning major maintenance to their home.

4 Conclusion

Consumers and entrepreneurs will be faced with increasing costs due to damage and losses related to climate change. Climate change will increase the incidence of extreme precipitation, flooding and periods of extreme drought. Examples of types of property damage that consumers will increasingly be confronted with are subsidence of homes, water damage due to flooding, and hail damage to solar panels. These types of damage can be very costly. It is important that consumers and entrepreneurs are aware of this. Consumers can reduce the impact of these risks by taking them into account in their financial planning, by taking out insurance against them where possible, and by taking preventive measures.

Such climate-related types of damage and losses are not always insured or insurable. Due to the unpredictability of the consequences and impact of climate change and the potentially huge cost of the resulting damage and losses, it is not always possible to take out insurance against this. And where certain types of damage and losses are covered, consumers may be faced with complex insurance policies with limitations, exclusions, prevention requirements and changing policy conditions. As a result, it may be unclear to consumers and entrepreneurs what is and isn't covered. In addition, there are major differences between insurers. Policy conditions and changes to these conditions should be transparent and understandable to consumers and entrepreneurs, so that they can base their decisions on these conditions.

The growing cost of damage and losses is a potential problem. It is up to the government and the insurance sector to jointly explore possible solutions. It makes sense for the Dutch government and the insurance sector to jointly explore possible ways to address the growing cost of climate-related damage and losses, and which parties can contribute to a solution. Different types of approaches are conceivable. One of these would be to further specify the role of the options available by law to the government to pay out relief in addressing such damage and losses. Another possible approach would be to make certain types of insurance cover or participation in insurance mandatory in the Netherlands, as is already the case for flood insurance in certain other countries. Yet another possible approach would be to arrange reinsurance in the international market for certain types of damage and losses (where possible given the global nature of climate change). Finally, raising awareness about prevention can help to reduce the total cost of climate-related damage and losses. We call on the government and the sector to examine the advantages and disadvantages of the various possible approaches, and to explore which approaches are most likely to be effective in tackling these important issues.



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