



BCRA

Belgian Climate Risk Assessment



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An aerial photograph of a dry, cracked riverbed. The cracked earth is a light brown color, with a network of fine, irregular cracks. A small, irregular pool of greenish-brown water is located in the lower right corner. The text 'cerac' is overlaid in the center in a white, lowercase, sans-serif font.

cerac

Setting the scene



Cerac's Mission

- Strengthen Belgium's resilience to climate change and ecosystem degradation
- Contribute to protecting citizens, territory, and society from climate consequences
- Impartial advisor to the National Security Council, policymakers, and the general public

Purpose of the BCRA

- Assess major climate and ecosystem risks for Belgium across sectors
- Identify knowledge gaps
- Provide sector-specific guidance and measures for adaptation policy and risk prevention



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The Belgian Climate Risk Assessment
(BCRA)



vito



LIÈGE université
Spiral



möbius

RAMBOLL

Wooclap

What does "climate risk" mean for you ?



1

Allez sur wooclap.com

2

Entrez le code d'événement dans le bandeau supérieur

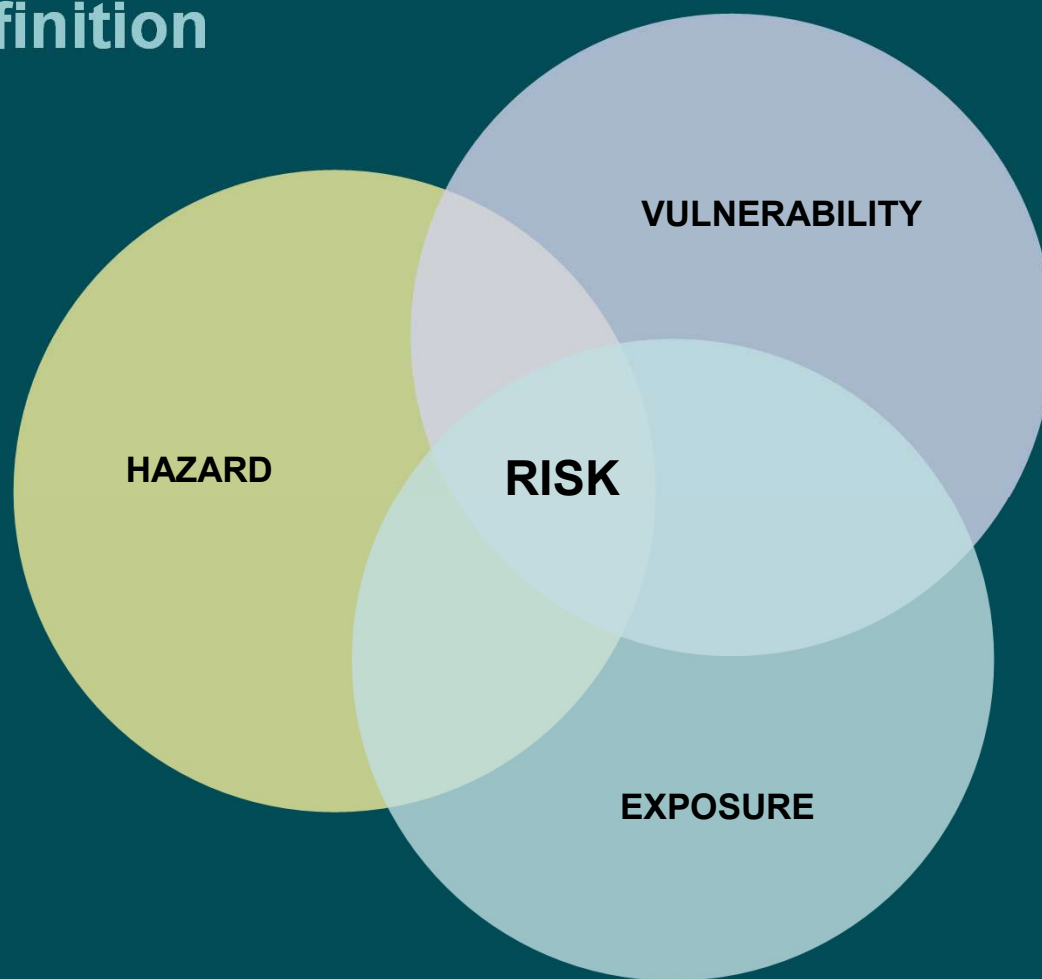
Code d'événement

CZQJHJ

📱 Activer les réponses par SMS

Risk: a definition

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Clusters

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Ecosystems



Food



Infrastructure &
buildings



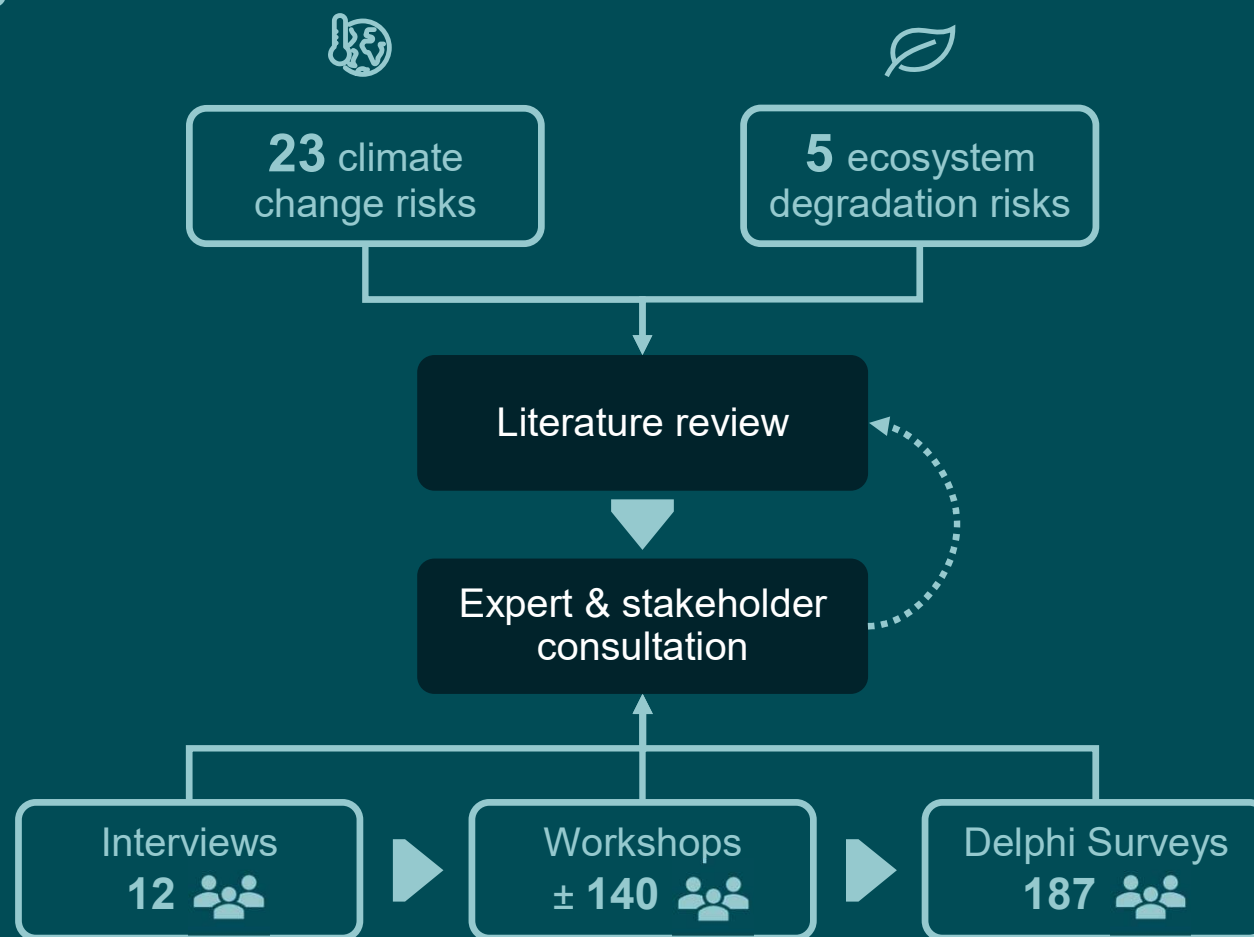
Health & wellbeing



Economy & Finance

Analysis

cerac








28 in-depth risk analyses

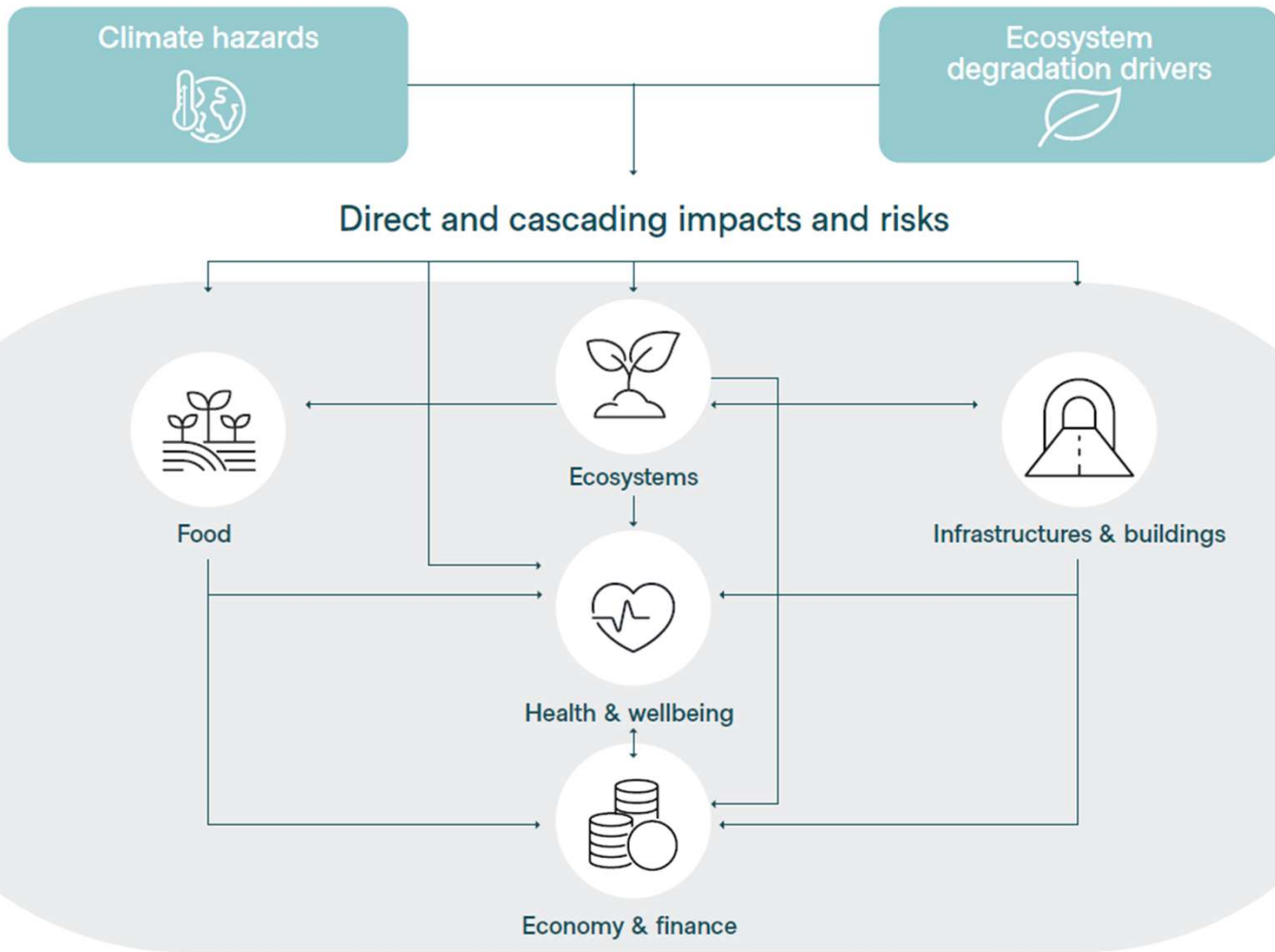


Climate risks



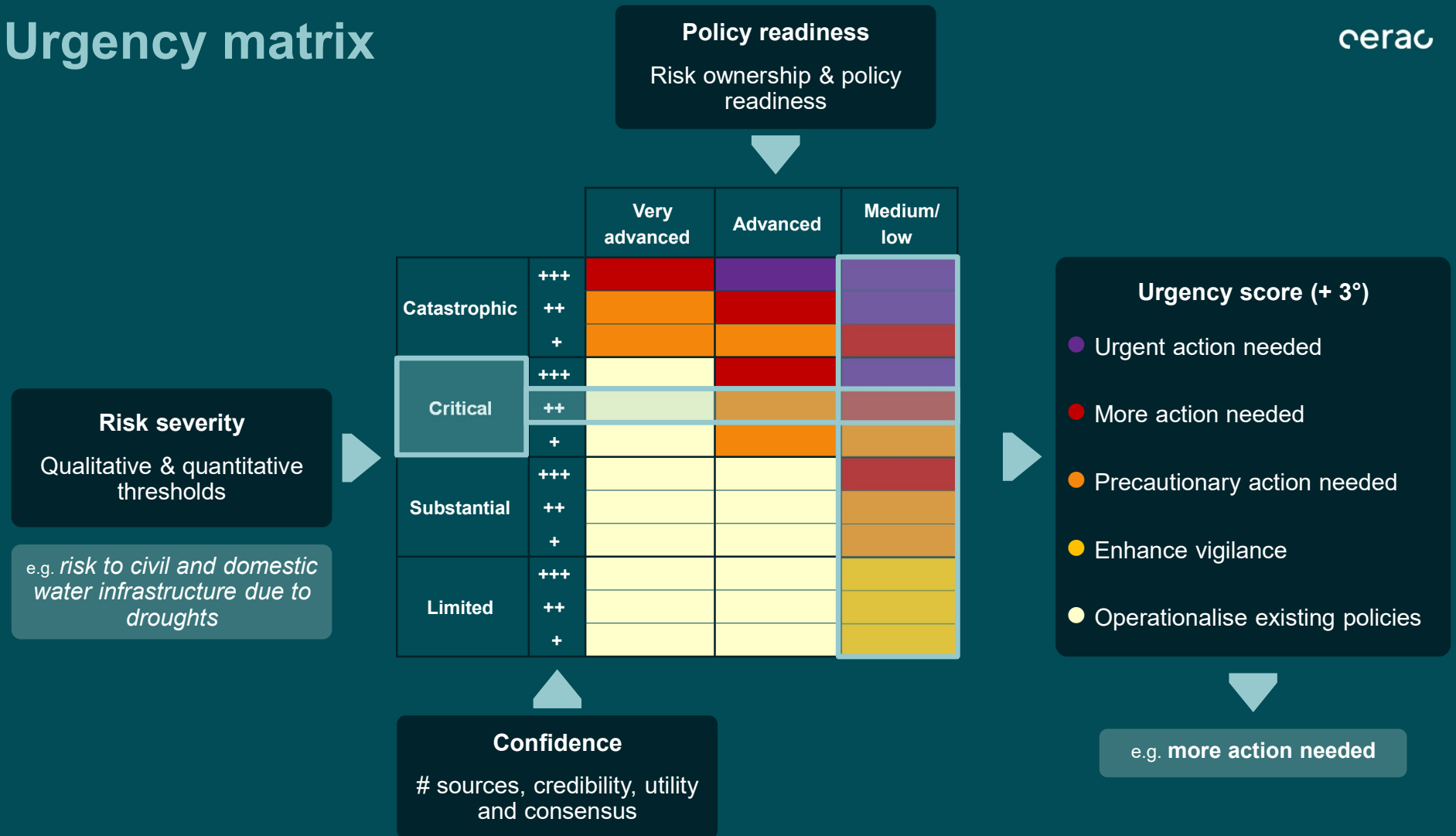
Ecosystem degradation risks

| Ecosystems  | Food  | Infrastructure & Buildings  | Health & Wellbeing  | Economy & Finance  |
|--|--|--|--|---|
| Risk to forest ecosystems due to gradual climate change | Risk to crops due to adverse weather conditions | Risk to buildings due to flooding | Risk to human health due to heat stress | Risk to property insurance due to flooding |
| Risk to forest ecosystems from wildfire | Risk to food production from soil ecosystem degradation | Risk to buildings due to changing moisture regime | Risk to human health due to the increase of vector-borne disease | Risk to public finances due to climate change |
| Risk to soil ecosystems due to droughts and erosion | Risk to food production due to pollinator decline | Risk to infrastructures and buildings due to invasive alien plant species | Risk to human health due to the increase in non-communicable disease | Risk to international food prices due to climate change |
| Risk to freshwater ecosystems due to droughts | Risk to livestock production from increased spread of diseases | Risk to energy & transport due to extreme weather conditions | Risk to mental health due to climate change | Risk to strategic imports due to climate change |
| Risk to terrestrial coastal ecosystems due to sea level rise, coastal flooding and changes in soil salinity | Risk to food safety due to climate impacts on global agricultural production | Risk to civil and domestic water infrastructures due to droughts | Risk to human health due to the increase of pandemic zoonotic diseases | Risk to industry from water stress |
| | | | Risk to health systems and social care delivery due to climate change | |
| | | | Risk to social cohesion and inequalities due to climate change | |
| | | | Risk of internal people displacement in Belgium due to flooding | |



Urgency matrix

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The bigger picture

- ▶ Social
- ▶ Security
- ▶ Policy

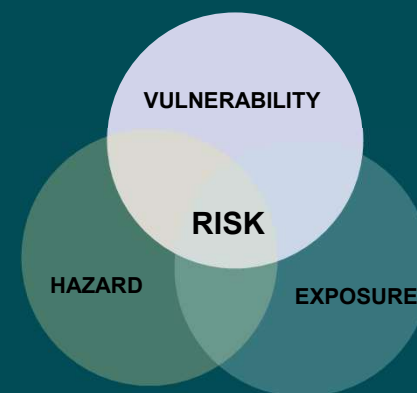




Social vulnerabilities

Analysis on three levels:

- Assessing risk to social cohesion
- Describing societal vulnerabilities across all risks
- Analysing vulnerability transversally



Social aspects: transversal chapter

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| | | Vulnerable groups | | | | | | | | | | | | | | | | | | | | | |
|--------------------|--|------------------------|---------|-------|------------------------|----------------------------|-----------------|-----------------------------------|-----------------------------|--------------------------|------------------|----------------------|--------------------|----------------------------------|-----------------|-----------------------------|------------------|---------|----------------|-------------------|-----------------------------------|----------------------------|--|
| Ecosystems | Risks | Children | Elderly | Women | Low-income populations | People in social isolation | Homeless people | People with physical disabilities | People with chronic illness | Mental health conditions | Language barrier | Migration background | Healthcare workers | Farmers and agricultural workers | Outdoor workers | Socially vulnerable workers | Small businesses | Renters | Private owners | Urban populations | People near vulnerable ecosystems | Living in remote locations | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| Food | Risk to forest ecosystems due to gradual climate change | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to forest ecosystems from wildfire | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to crops due to adverse weather conditions | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to food production due to soil ecosystem degradation | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to food production due to pollinator decline | | | | | | | | | | | | | | | | | | | | | | |
| Infrastructure | Risk to livestock production from increased spread of diseases | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to food safety due to climate impacts on global agricultural production | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to buildings due to flooding | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to buildings due to changing moisture regime | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to infrastructure and buildings due to invasive alien plant species | | | | | | | | | | | | | | | | | | | | | | |
| Health & wellbeing | Risk to energy & transport infrastructure due to extreme weather conditions | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to civil and domestic water infrastructure due to droughts | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to human health due to heat stress | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to human health due to the increase of vector-borne diseases | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to human health due to the increase of non-communicable diseases | | | | | | | | | | | | | | | | | | | | | | |
| Economy & Finance | Risk to mental health due to climate change | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to human health from the increase of zoonotic diseases due to biodiversity loss | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to health systems and social care delivery due to climate change | | | | | | | | | | | | | | | | | | | | | | |
| | Risk of internal displacement of people in Belgium due to flooding | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to property insurance due to flooding | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to public finances due to climate change | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to industry from water stress | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to strategic imports due to climate change | | | | | | | | | | | | | | | | | | | | | | |
| | Risk to international food prices due to climate change | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | Housing and geographic | | | | | | | | | | | | | | | | | | | | | |

Demographic

Socio-economic

Health-related

Cultural & linguistic

Occupational

Housing and geographic



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Social vulnerabilities

Key messages

- Climate change disproportionately affects vulnerable groups and **amplifies social inequalities**
- Vulnerability is **multidimensional**
- Reducing inequalities **strengthens resilience** for society as a whole



Consider **social climate justice** as a condition of **national security**





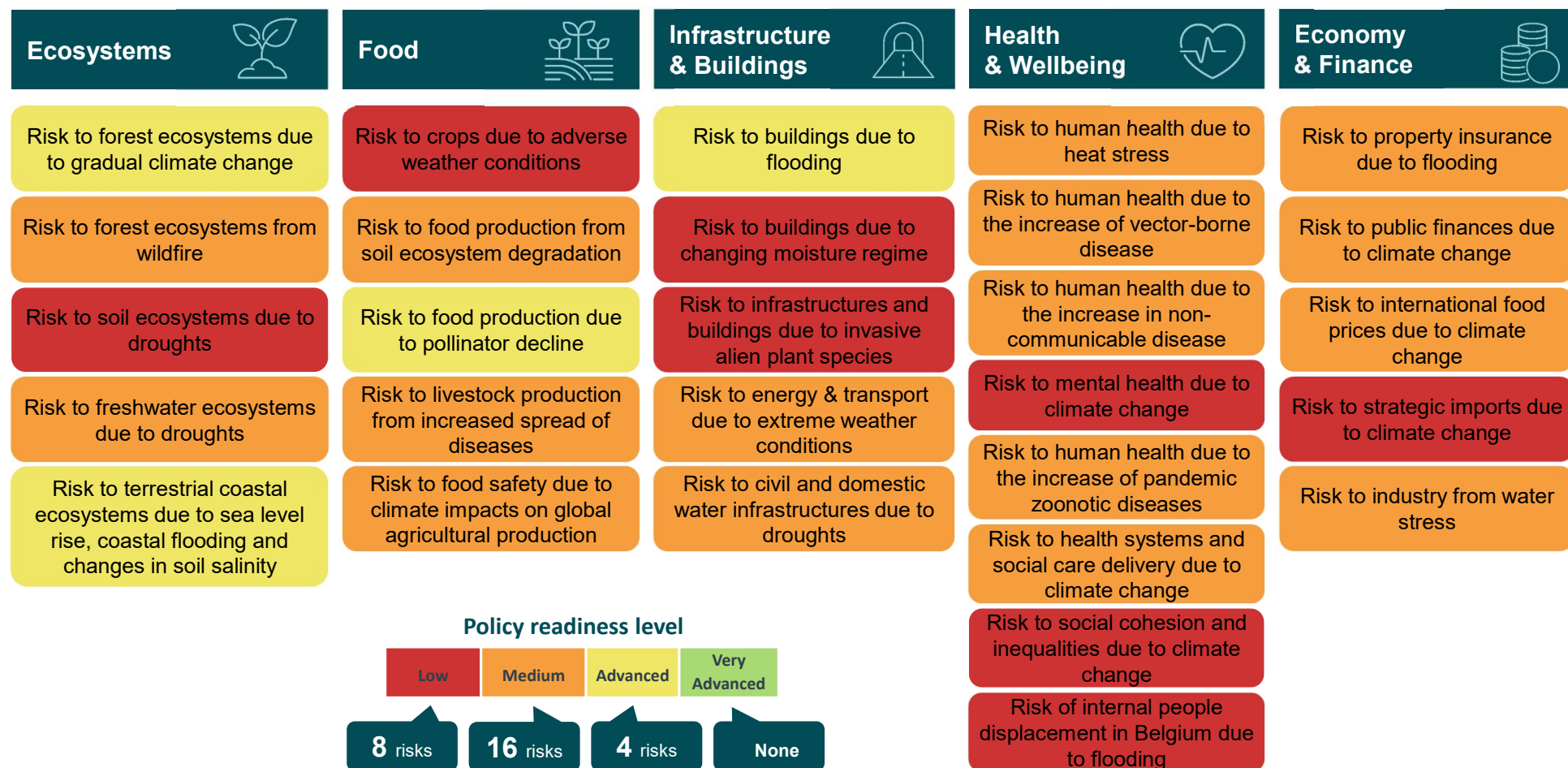
Security aspects

- **Cascading** effects
- Climate risks are **systemic**
- **Reactive** vs **preventive** strategies

16 PEACE, JUSTICE
AND STRONG
INSTITUTIONS



Current policy readiness



Policy aspects

4 dimensions:

- Risk awareness
- Risk ownership
- Policy framework
- Policy analysis

e.g. Risk to buildings due to flooding



Regions, Provinces,
Municipalities,...

Maps and flood risks management

European Floods Directive
(2007/60/EC)

Tools & frameworks BUT need improved
implementation, LT planning, coordination

Score: **Advanced**

Policy aspects

Key hurdles for policy readiness:

- Fragmented governance & institutional rigidity
- Temporal misalignment - short-term political & budget cycles vs long-term investment needed
- Financial constraints blocking large-scale adaptation
- Weak link between adaptation & security



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BCRA Findings

Wooclap

What climate change risks do **you** think will affect Belgium the most?



1

Allez sur wooclap.com

2

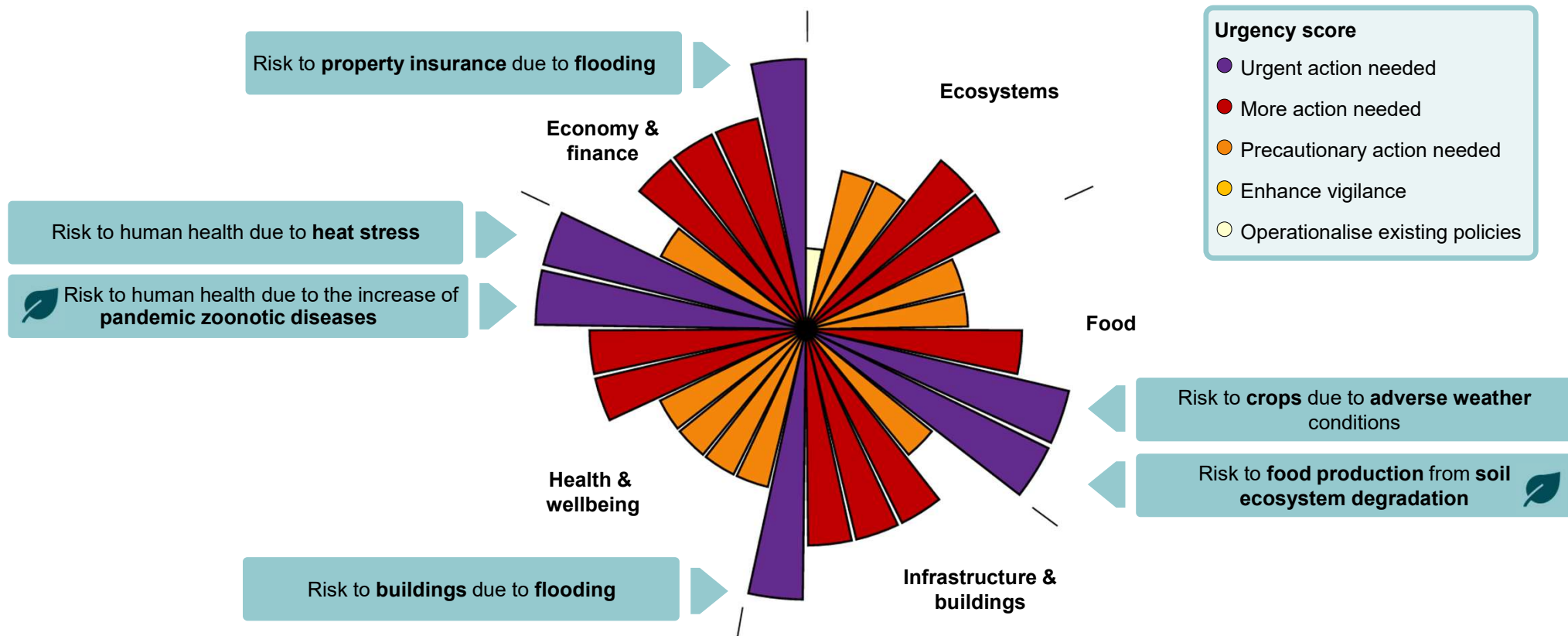
Entrez le code d'événement dans le bandeau supérieur

Code d'événement

CZQJHJ

 Activer les réponses par SMS

6 risks demand urgent action



Ecosystems

| Climate risk | Urgency to act | Risk severity | | | Policy characteristics | |
|--|----------------------------------|---------------|-----|-----|------------------------|----------------|
| | | 2°C | 3°C | 4°C | Policy readiness | Risk ownership |
| Risk to forest ecosystems due to gradual climate change | Precautionary action needed | ++ | ++ | ++ | Advanced | Regional |
| Risk to forest ecosystems from wildfire | Precautionary action needed | + | + | + | Medium | Regional |
| Risk to terrestrial coastal ecosystems due to sea level rise, coastal flooding and changes in soil salinity | Operationalise existing policies | ++ | ++ | ++ | Advanced | Regional |
| Risk to freshwater ecosystems due to droughts | More action needed | ++ | ++ | ++ | Medium | Regional |
| Risk to soil ecosystems due to droughts and erosion | More action needed | ++ | ++ | ++ | Low/Medium | Regional |

Urgency to act

- Urgent action needed
- More action needed
- Precautionary action needed
- Enhance vigilance
- Operationalise existing policies

Risk severity

- Catastrophic
- Critical
- Substantial
- Limited

Confidence

- Low: +
- Medium: ++
- High: +++





66%

of Belgian soil is potentially threatened
in terms of its *biological functions*

Soil: a precious growth medium teeming with life

- ▶ Soil biodiversity is key for soil functions
- ▶ Anthropogenic disturbances drive loss of soil biodiversity
- ▶ Cascading climate-driven erosion & further degradation
- ▶ Soil recovery time scale far exceeding human time scale
- ▶ Consequences on food production, society

Infrastructure & buildings

| Climate and ecosystems degradation risk | Urgency to act | Risk severity | | | Policy characteristics | |
|---|-----------------------------|---------------|-----|-----|------------------------|----------------|
| | | 2°C | 3°C | 4°C | Policy readiness | Risk ownership |
| Risk to infrastructure and buildings due to invasive alien plant species (ecosystems degradation) | More action needed | ++ | | | Low | Co-owned |
| Risk to buildings due to flooding | Urgent action needed | +++ | +++ | +++ | Advanced | Regional |
| Risk to buildings due to changing moisture regime | Precautionary action needed | ++ | ++ | ++ | Low | Regional |
| Risk to energy and transport infrastructure due to extreme weather conditions | More action needed | ++ | | | Medium | Co-owned |
| Risk to civil and domestic water infrastructure due to droughts | More action needed | ++ | ++ | ++ | Medium | Regional |

Urgency to act

- Urgent action needed
- More action needed
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- Enhance vigilance
- Operationalise existing policies

Risk severity

- Catastrophic
- Critical
- Substantial
- Limited

Confidence

- Low: +
- Medium: ++
- High: +++



Risk to buildings due to flooding



Risk severity

- 2°C = Catastrophic ●
- 3°C = Catastrophic ●
- 4°C = Catastrophic ●

Confidence

- 2°C = +++
- 3°C = +++
- 4°C = +++

Policy readiness

Advanced: Strong frameworks but weak enforcement & funding.

Risk ownership

Regional

Comments

- **Vesder floods:** 39 deaths, 100.000 affected, billions in economic losses
- By 2080 >20.000 Belgians could face flood impacts annually
- **Drivers:** heavier rainfall & sea-level rise make past flood records unreliable. Rapid urbanisation increases runoff.

Recommendations

- Spatial planning!
- Limit new builds in risk zones, apply adaptive codes, restore wetlands & floodplains, boost early warnings & public awareness.

Health & population wellbeing

| Climate risk | Urgency to act | Risk severity | | | Policy characteristics | |
|---|-----------------------------|---------------|-----|-----|------------------------|----------------|
| | | 2°C | 3°C | 4°C | Policy readiness | Risk ownership |
| Risk to human health due to heat stress | Urgent action needed | +++ | +++ | +++ | Medium | Co-owned |
| Risk to human health due to the increase of vector-borne diseases | Precautionary action needed | + | + | + | Medium | Co-owned |
| Risk to human health due to the increase in non-communicable diseases | More action needed | ++ | ++ | ++ | Medium | Co-owned |
| Risk to mental health due to climate change | Precautionary action needed | + | + | + | Low | Co-owned |
| Risk to health systems and social care delivery due to climate change | Precautionary action needed | ++ | ++ | ++ | Medium | Co-owned |
| Risk to human health due to the increase of pandemic zoonotic diseases (ecosystems degradation) | Urgent action needed | ++ | | | Medium | Co-owned |
| Risk to social cohesion and inequalities due to climate change | More action needed | +++ | + | + | Low/Medium | Co-owned |
| Risk of internal displacement of people in Belgium due to flooding | Precautionary action needed | + | + | + | Low | Regional |

Urgency to act

- Urgent action needed
- More action needed
- Precautionary action needed
- Enhance vigilance
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Risk severity

- Catastrophic
- Critical
- Substantial
- Limited

Confidence

- Low: +
- Medium: ++
- High: +++



Wooclap

How many additional deaths could be caused annually by heat?



1 Allez sur wooclap.com

2 Entrez le code d'événement dans le bandeau supérieur

Code d'événement

CZQJHJ

Activer les réponses par SMS

A child is splashing in shallow water at sunset. The water is dark, and the sky is a mix of orange and blue. The child is wearing a blue shirt and is captured in the middle of a splash, with water droplets frozen in time around their head. The background shows a beach with some seaweed and a calm sea under a colorful sky.

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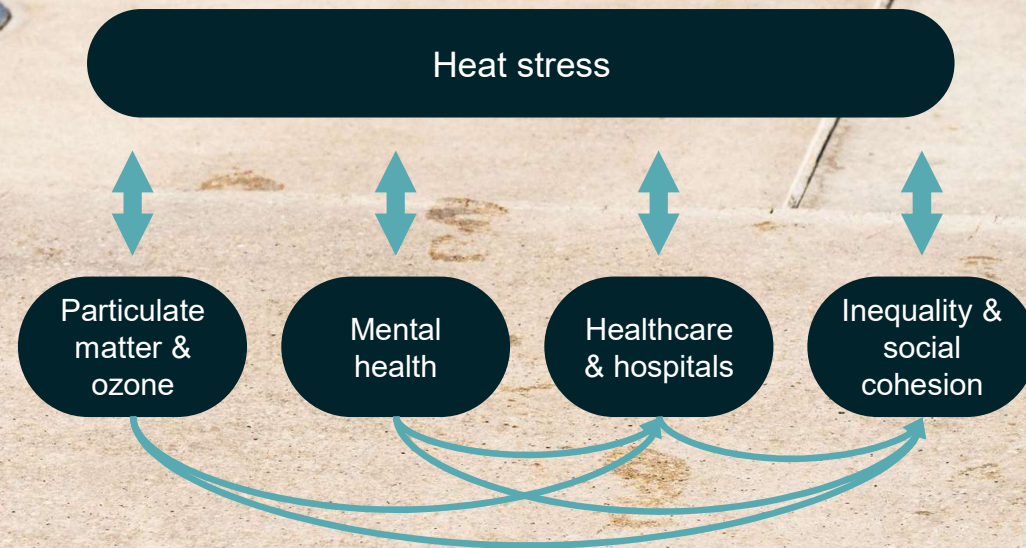
>1000

Annual heat deaths

| | +2°C | +3°C | +4°C |
|---------------|------|-------------------------|------|
| Severity | ●●●● | ●●●● | ●●●● |
| Confidence | +++ | +++ | +++ |
| Co-owned risk | | Medium policy readiness | |

- ▶ Not just **mortality**
- ▶ Not just the **elderly**
- ▶ **Urban** Heat Islands

Beyond direct risks





Risk to human health due to the increase of pandemic zoonotic diseases

Risk severity

- Catastrophic •

Confidence

- ++

Policy readiness

Medium

Risk ownership

Co-owned

Comments

- Main drivers = habitat fragmentation, urban encroachment and ecosystem degradation.
- At global level, but with local risks due to globalisation and central position of Belgium

Recommendations

- Coordinate ecosystem-, animal-, and human health policies (**One Health**).
- Improve surveillance and expand beyond limited number of diseases
- Facilitate data sharing, reduce fragmentation and create a central point of contact

Food

| Climate risk | Urgency to act | | Risk severity | | | Policy characteristics | |
|---|-----------------------------|--|---------------|-----|-----|------------------------|----------------|
| | | | 2°C | 3°C | 4°C | Policy readiness | Risk ownership |
| Risk to crops due to adverse weather conditions | Urgent action needed | | +++ | ++ | ++ | Low | Regional |
| Risk to food production due to soil ecosystems degradation (ecosystems degradation) | Urgent action needed | | +++ | | | Medium | Regional |
| Risk to food production due to pollinator decline (ecosystems degradation) | Precautionary action needed | | ++ | | | Advanced | Regional |
| Risk to livestock production from increased spread of diseases | More action needed | | ++ | + | + | Medium | Regional |
| Risk to food safety due to climate impacts on global agricultural production | Precautionary action needed | | + | + | + | Medium | Federal |

Urgency to act

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- Precautionary action needed
- Enhance vigilance
- Operationalise existing policies


Risk severity

- Catastrophic
- Critical
- Substantial
- Limited

Confidence

- Low: +
- Medium: ++
- High: +++





12%

Belgian's self-supply rate
for *fruit & vegetables*

Unhealthy soil means a less resilient society

| | |
|---------------|-------------------------|
| Severity | Critical ● |
| Confidence | +++ |
| Regional risk | Medium policy readiness |

- ▶ **[Farmers]** declining yields & rising soil-related costs
- ▶ **[Water utilities]** declining natural filtration & higher treatment costs
- ▶ **[Municipalities]** more infrastructure damage
- ▶ **[Citizens]** higher water prices & reduced food security
- ▶ Impacts on rural economies, urban water supply & climate adaptation
- ▶ Soil degradation = **systemic risk**



Risk to crops due to adverse weather conditions

Risk severity

- 2°C = Critical ●
- 3°C = Substantial ●
- 4°C = Substantial ●

Confidence

- 2°C = +++
- 3°C = ++
- 4°C = ++

Comments

- Widespread negative yield and economic exposure at +2°C
- Possible CO₂ fertilisation but increased volatility and risk of crop failure at +3/4°C

Policy readiness

Low: PAC still largely supporting short-term productivity and income stability, rather than building resilience to climate shocks

Risk ownership

Regional

Recommendations

- Rethinking the response, conventional solutions may worsen environmental pressures
- Need for a transition to agroecological practices

Economy & finance

| Climate risk and ecosystems degradation risk | Urgency to act | | Risk severity | | | Policy characteristics | |
|---|-----------------------------|--|---------------|-----|-----|------------------------|----------------|
| | | | 2°C | 3°C | 4°C | Policy readiness | Risk ownership |
| Risk to property insurance due to flooding | Urgent action needed | | +++ | +++ | +++ | Medium | Co-owned |
| Risk to public finances due to climate change | More action needed | | + | + | + | Medium | Co-owned |
| Risk to strategic imports due to climate change | More action needed | | ++ | ++ | ++ | Low/Medium | Co-owned |
| Risk to international food prices due to climate change | More action needed | | ++ | ++ | ++ | Medium | Co-owned |
| Risk to industry from water stress (ecosystems degradation) | Precautionary action needed | | + | | | Medium | Regional |

Urgency to act

- Urgent action needed
- More action needed
- Precautionary action needed
- Enhance vigilance
- Operationalise existing policies

Risk severity

- Catastrophic
- Critical
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- Limited

Confidence

- Low: +
- Medium: ++
- High: +++



Wooclap

What was the total estimated repair cost following 2021 floods?



1

Allez sur wooclap.com

2

Entrez le code d'événement dans le bandeau supérieur

Code d'événement

CZQJHJ

 Activer les réponses par SMS



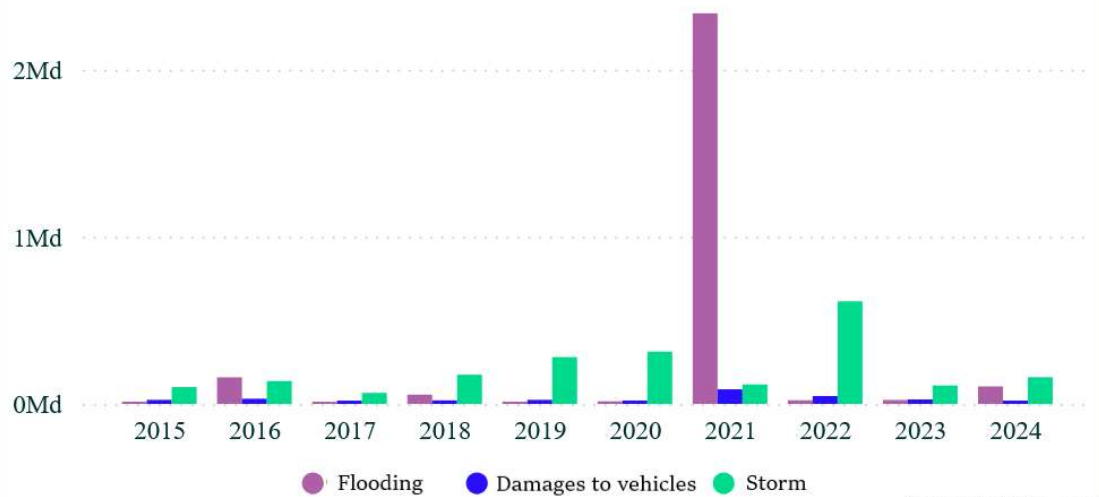
5.2 billion €

Estimated total repair costs after the July 2021 flooding.

| | +2°C | +3°C | +4°C |
|---------------|------|-------------------------|------|
| Severity | ●●●○ | ●●●● | ●●●● |
| Confidence | +++ | +++ | +++ |
| Co-owned risk | | Medium policy readiness | |

- ▶ 2.4 billion € insured damages.
- ▶ 39 casualties, 100.000 affected, 15.000 left homeless.
- ▶ 45.000 houses and 11.000 vehicles highly damaged, 150.000 tons of waste, 559 affected bridges, 3.000 enterprise's buildings damaged.
- ▶ Regional solidarity mechanisms not funded, insurers had to step in.

Total cost of insured claims per year in euros



Source: Assuralia, 2025

Flooding

Liquidity risk

Legal risk

Uninsurability

Public finances



Conclusions



- 1 Allez sur wooclap.com
- 2 Entrez le code d'événement dans le bandeau supérieur

Code d'événement
CZQJHJ

Activer les réponses par SMS

The publications

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Final report

+ Methodological report

+ 28 Technical papers

+ 28 risk summaries







Website

NL cerac.be/nl/bcra

FR cerac.be/fr/bcra

EN cerac.be/en/bcra

Next steps

-  Raise awareness & ensure stakeholder ownership
-  Transform recommendations in actionable measures
-  Develop sectoral assessments for urgent risks
-  Further analysis of risks





Thank you for your
attention

aurore.brunson@cerac.belgium.be

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