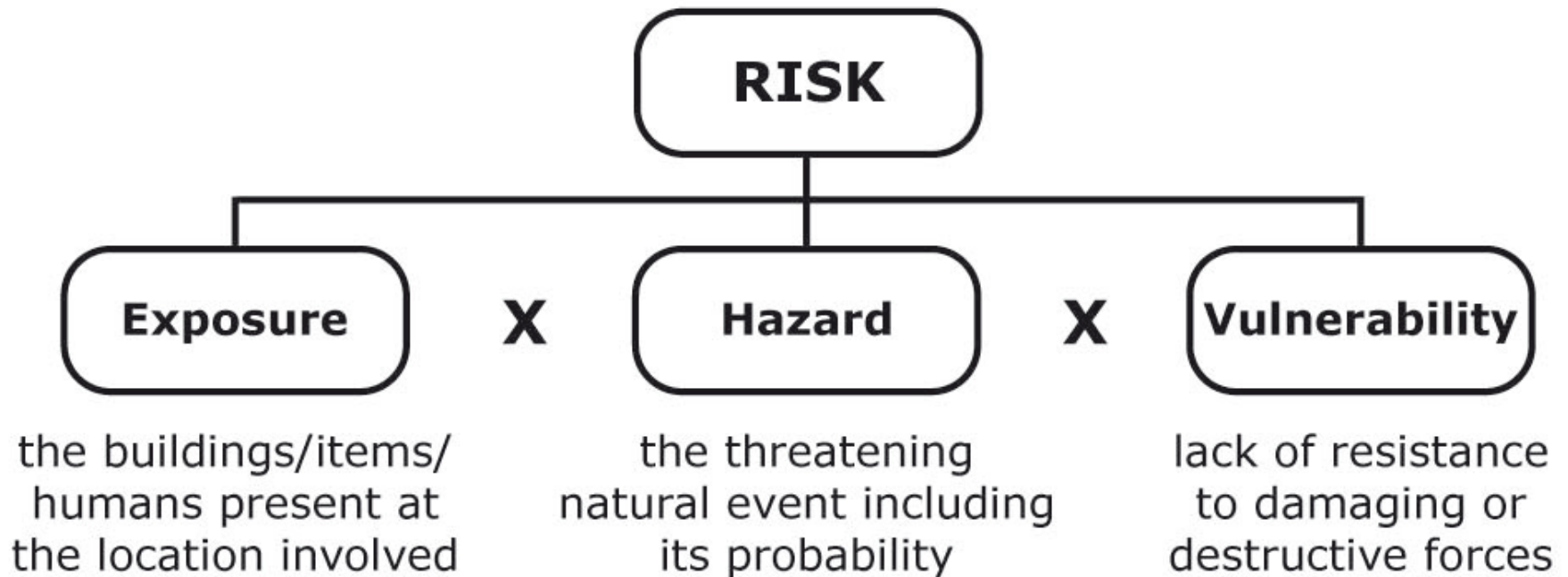




Climate Adaptation - flood risk in Netherlands and USA

Risk Framework



Risk Framework

Emergency
Management



Spatial
Planning



Prevention



(Source: Rijkswaterstaat)

Disaster Management Cycle



De Moel and Aerts, 2008

Prevention



洪水でも決壊しないスーパー堤防

●スーパー堤防の整備イメージ

●小松川地区の整備状況

整備前

- 従来の堤防構造
- 堤防の背後に住宅が密集している
- 堤防の背後に工場や商業施設がある
- 堤防の背後に農地がある
- 堤防の背後に道路がある
- 堤防の背後に電線がある
- 堤防の背後にパイプラインがある
- 堤防の背後に地下鉄がある
- 堤防の背後に地下ケーブルがある
- 堤防の背後に地下トンネルがある
- 堤防の背後に地下駐車場がある
- 堤防の背後に地下倉庫がある
- 堤防の背後に地下工場がある
- 堤防の背後に地下商業施設がある
- 堤防の背後に地下住宅がある
- 堤防の背後に地下学校がある
- 堤防の背後に地下病院がある
- 堤防の背後に地下役所がある
- 堤防の背後に地下図書館がある
- 堤防の背後に地下公園がある
- 堤防の背後に地下スポーツ施設がある
- 堤防の背後に地下文化施設がある
- 堤防の背後に地下商業施設がある
- 堤防の背後に地下住宅がある
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- 堤防の背後に地下文化施設がある

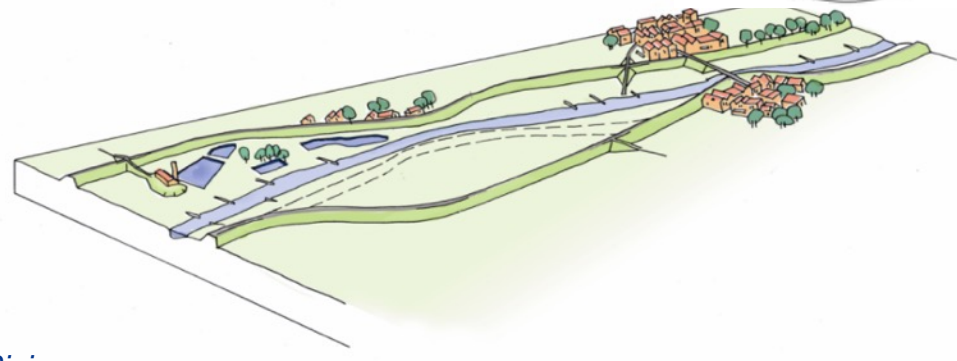
整備後

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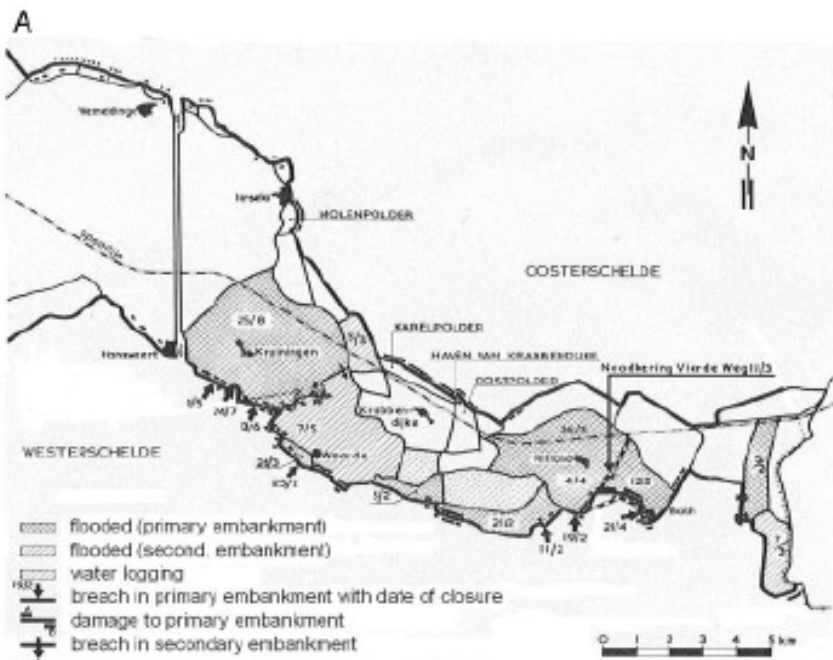
Japan, foto: Frans van de Ven, 2007



Prevention



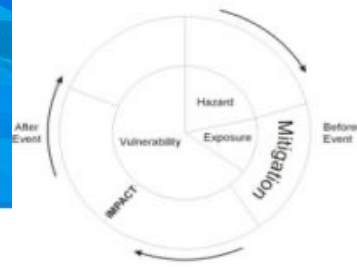
Ruimte voor de Rivier



Klijn et al., 2007

Figure 2 Areas flooded in a dike-ring area in the southwest Netherlands during the 1953 disaster (a) and flood pattern and depth resulting from breaches in the same locations as simulated with SOBEK 1D-2D (b), both showing the influence of former flood defences on flooded surface area

Mitigation: reduce impact



Danger map for Sörenberg, Switzerland



Legend:
h: depth of flow [m]
v: current velocity [m/s]

- Red: elevated danger
▶ Prohibited area
- Blue: medium danger
▶ Conditional use area
- Yellow: low danger
▶ Awareness zone
- Yellow/White: residual danger
▶ Awareness zone

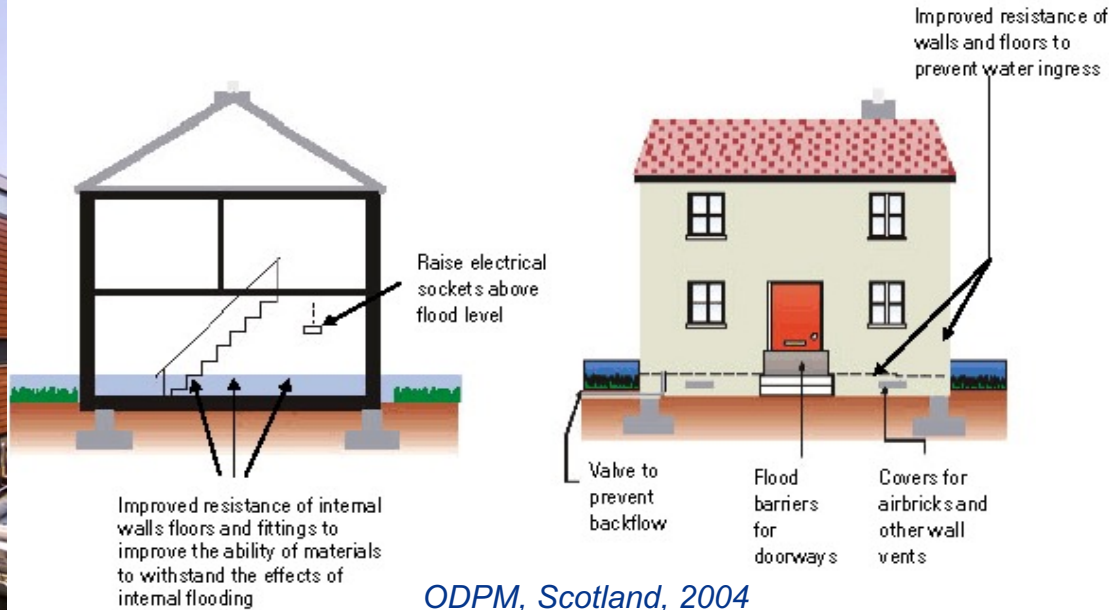
Swiss, Zimmerman et al., 2005

Figure 2: Wet proofing – measures to make the building more resilient to flooding

Figure 3: Dry proofing – measures to keep water out of building



Amsterdam, photo: Wojtek Gurak/flickr



ODPM, Scotland, 2004

Preparation



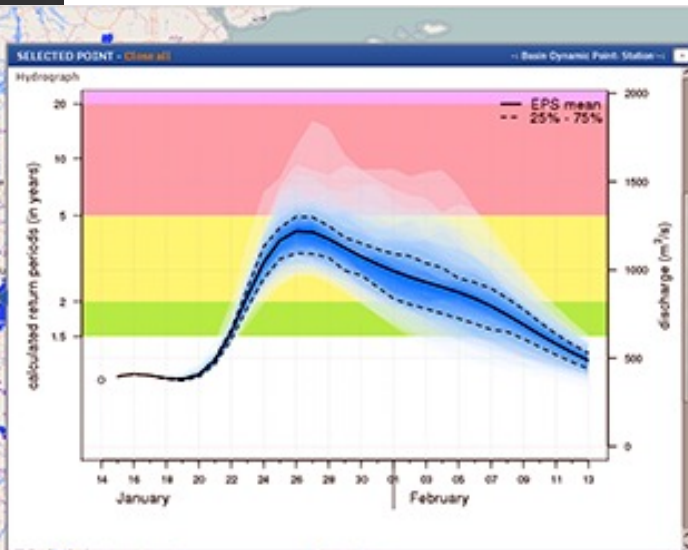
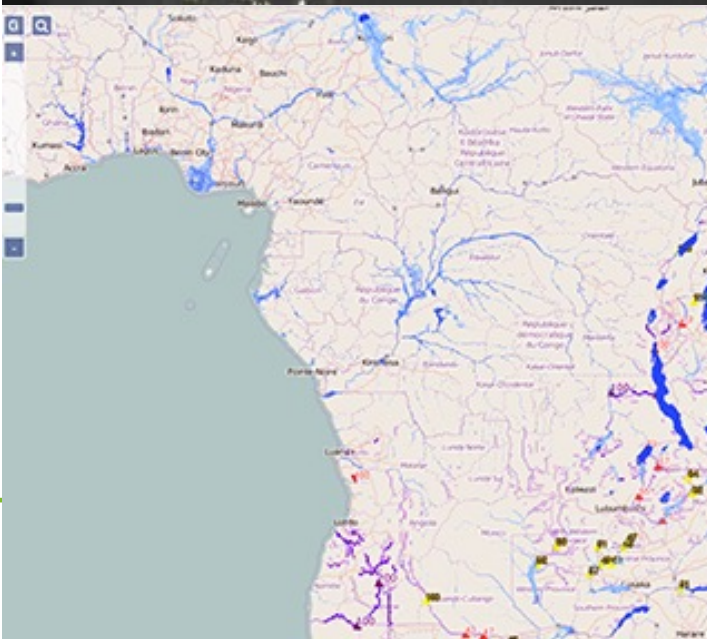
your flood plan

Know how to turn off your gas, electricity and water mains supplies



Start preparing today before a flood happens. Use this checklist as your flood plan.

- 1. Check your insurance cover**
 - Check your buildings and contents insurance policy.
 - Confirm you are covered for flooding.
 - Find out if the policy replaces new for old, and if it has a limit on repairs.
 - Don't underestimate the value of your contents.
- 2. Know how to turn off your gas, electricity and water mains supplies**
 - Ask your supplier how to do this.
 - Mark taps or switches with stickers to help you remember.
- 3. Prepare a flood kit of essential items (please tick)**
 - Copies of your home insurance documents.
 - A torch with spare batteries.
 - A wind-up or battery radio.
 - Warm, waterproof clothing and blankets.
 - A first aid kit and prescription medication.
 - Bottled water and non-perishable foods.
 - Baby food and baby care items.
 - This leaflet including your list of important contact numbers.
 - Keep your flood kit handy.
- 4. Know who to contact and how**
 - Agree where you will go and how to contact each other.
 - Check with your council if pets are allowed at evacuation centres.
 - Keep a list with all your important contacts to hand.
- 5. Think about what you can move now**
 - Don't wait for a flood. Move items of personal value such as photo albums, family videos and treasured mementos to a safe place.
- 6. Think about what you would want to move to safety during a flood**
 - Outdoor pets
 - Cars
 - Furniture
 - Electrical equipment
 - Garden pot plants and furniture
 - What else? _____



Response



Bangladesh



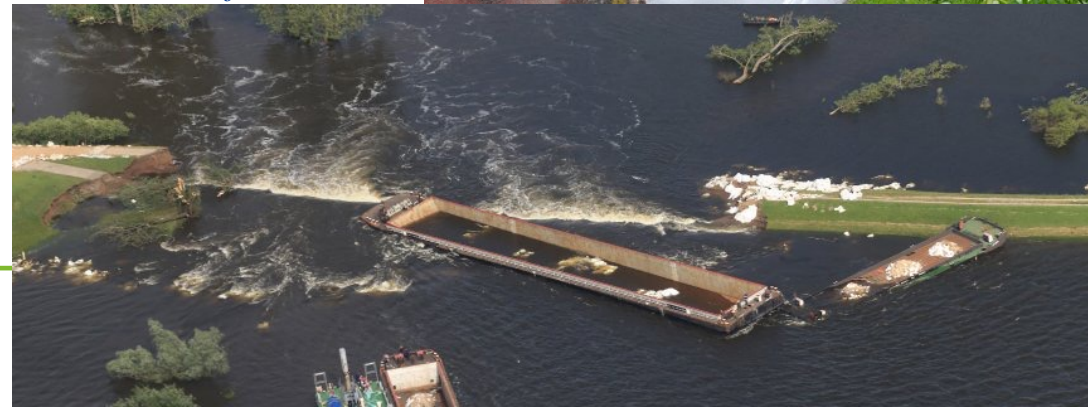
Fargo, USA



Elbe flood 2013



USA



Recovery



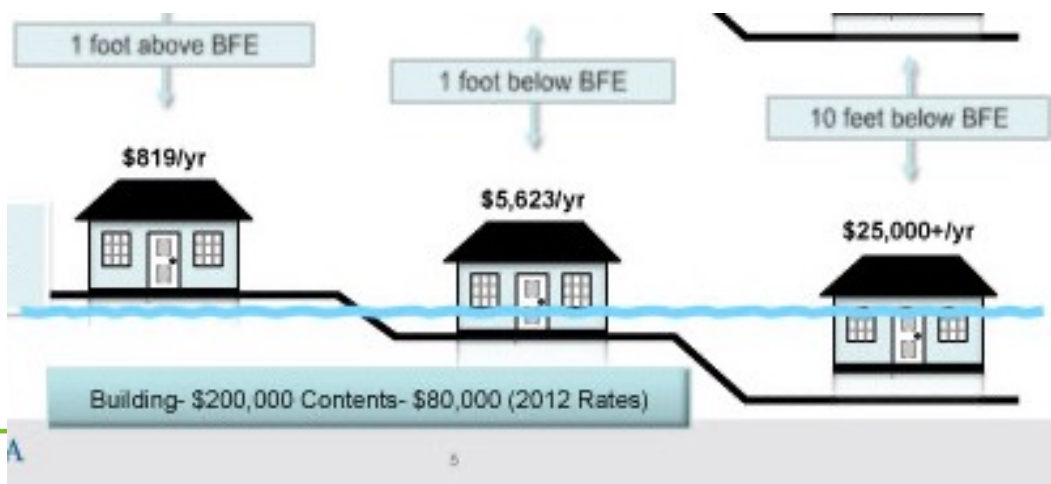
 VERBOND VAN VERZEKERAARS

Uit een tweede inventarisatie van het Verbond van Verzekeraars blijkt dat verzekeraars inmiddels zo'n 70 procent van de particuliere schades en circa 50 procent van de zakelijke schades volledig hebben afgehandeld. Grote, complexe waterschades, de invloed van COVID-19 en schaarste in de bouwbranche zorgen voor een langer afhandelproces. In totaal hebben verzekeraars circa 25.000 schademeldingen uit Limburg en Brabant ontvangen als gevolg van de wateroverlast in juli. Het Verbond schat de totale verzekerde schade op zo'n 160 tot 250 miljoen euro.

Kabinet presenteert schaderegeling wateroverlast Limburg en Noord-Brabant

Nieuwsbericht | 13-08-2021 | 15:36

Het kabinet heeft vandaag ingestemd met de schaderegeling om tegemoet te komen in materiële schade die is ontstaan door onder meer de overstromingen in juli dit jaar. Deze regeling is in nauwe samenwerking met de regio tot stand gekomen en zal zo spoedig mogelijk in werking treden. De schade in Limburg en een deel van Noord-Brabant is immens. Voor alle getroffen is hun verzekering het eerste aanspreekpunt. De verzekeraars zijn reeds gestart met het vergoeden van geleden schade. Zoals direct na de ramp aangekondigd wil het kabinet burgers, bedrijven, organisaties en overheden graag financieel bijstaan met een tegemoetkoming in onverzekerbare schade.

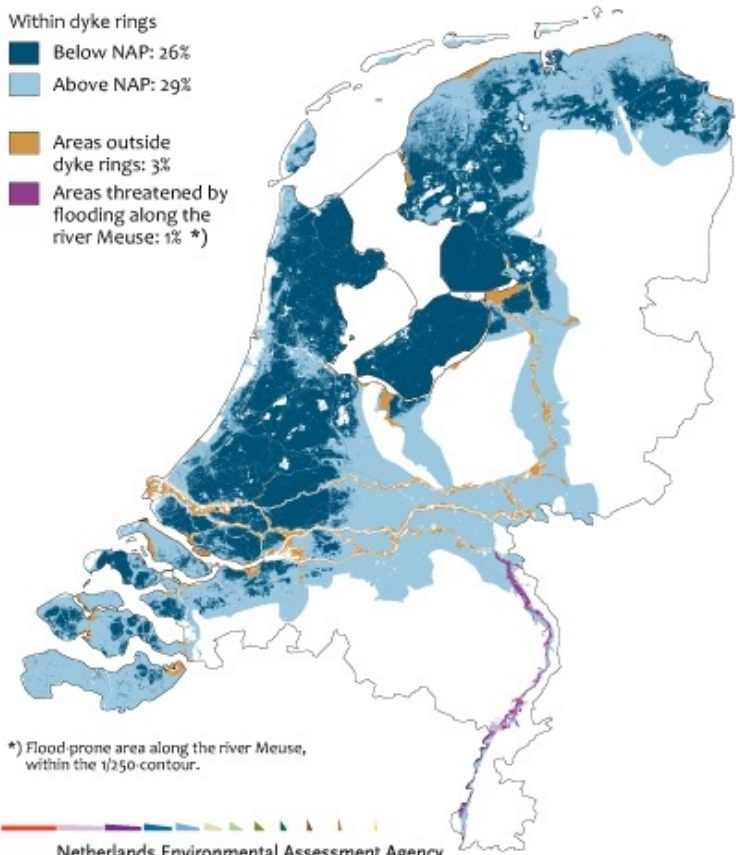


Focus Netherlands



Flood-prone area

- Within dyke rings
 - Below NAP: 26%
 - Above NAP: 29%
- Areas outside dyke rings: 3%
- Areas threatened by flooding along the river Meuse: 1% (*)

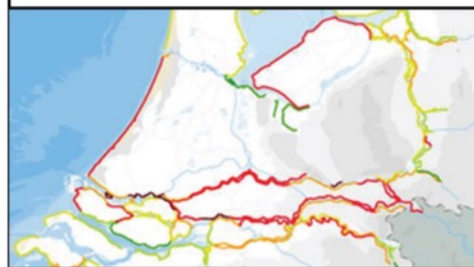


*) Flood-prone area along the river Meuse, within the 1/250-contour.

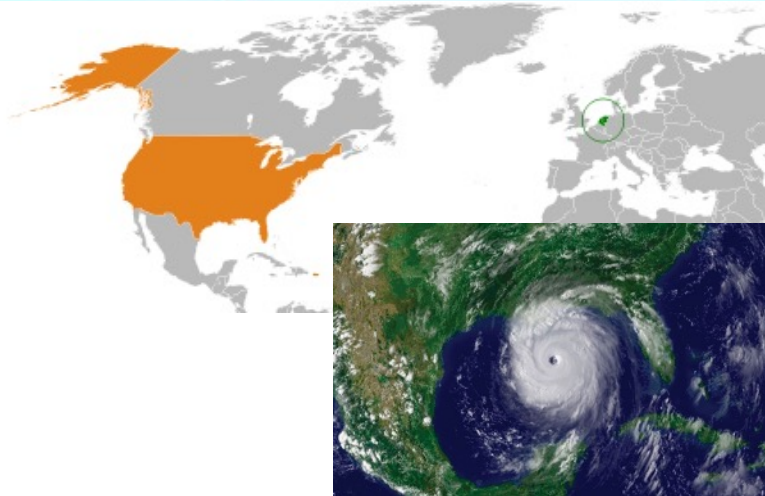
Netherlands Environmental Assessment Agency

Safety standards (flooding probability)

- 1/300 per year
- 1/1000 per year
- 1/3000 per year
- 1/10000 per year
- 1/30000 per year
- 1/100000 per year



Focus USA



Homeowner's Guide to Retrofitting

Six Ways to Protect Your Home From Flooding

FEMA P-312, Second Edition / December 2009



Take-home

- Reducing risk can be through reducing hazard, exposure, vulnerability
- Large variety of adaptation options
 - > Structural and non-structural
 - > Policy can incentivize, or be a barrier
- What to do depends on context
- We can learn from other places

