# WORKSHOP: Technical training on how to set Targets for the Global Covenant

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# The CoM pillars: Adaptation to Climate Change

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European Commission

# Essential requirements for adaptation planning

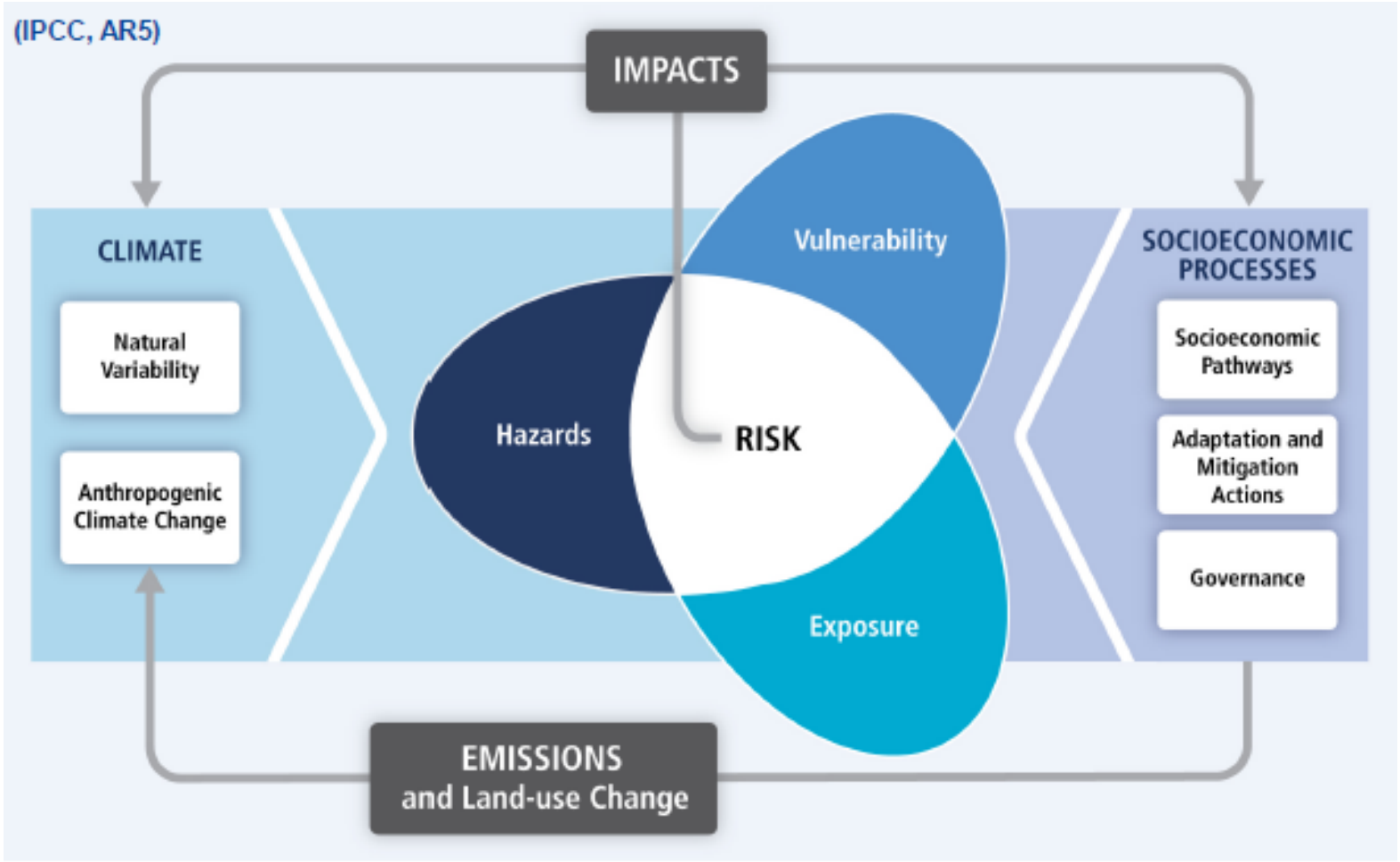
## Five key requirements

1. Identification of current and future climatic hazards
2. Identification of critical infrastructure
3. Active stakeholder participation
4. Avoid maladaptation
5. Estimate implementation action costs

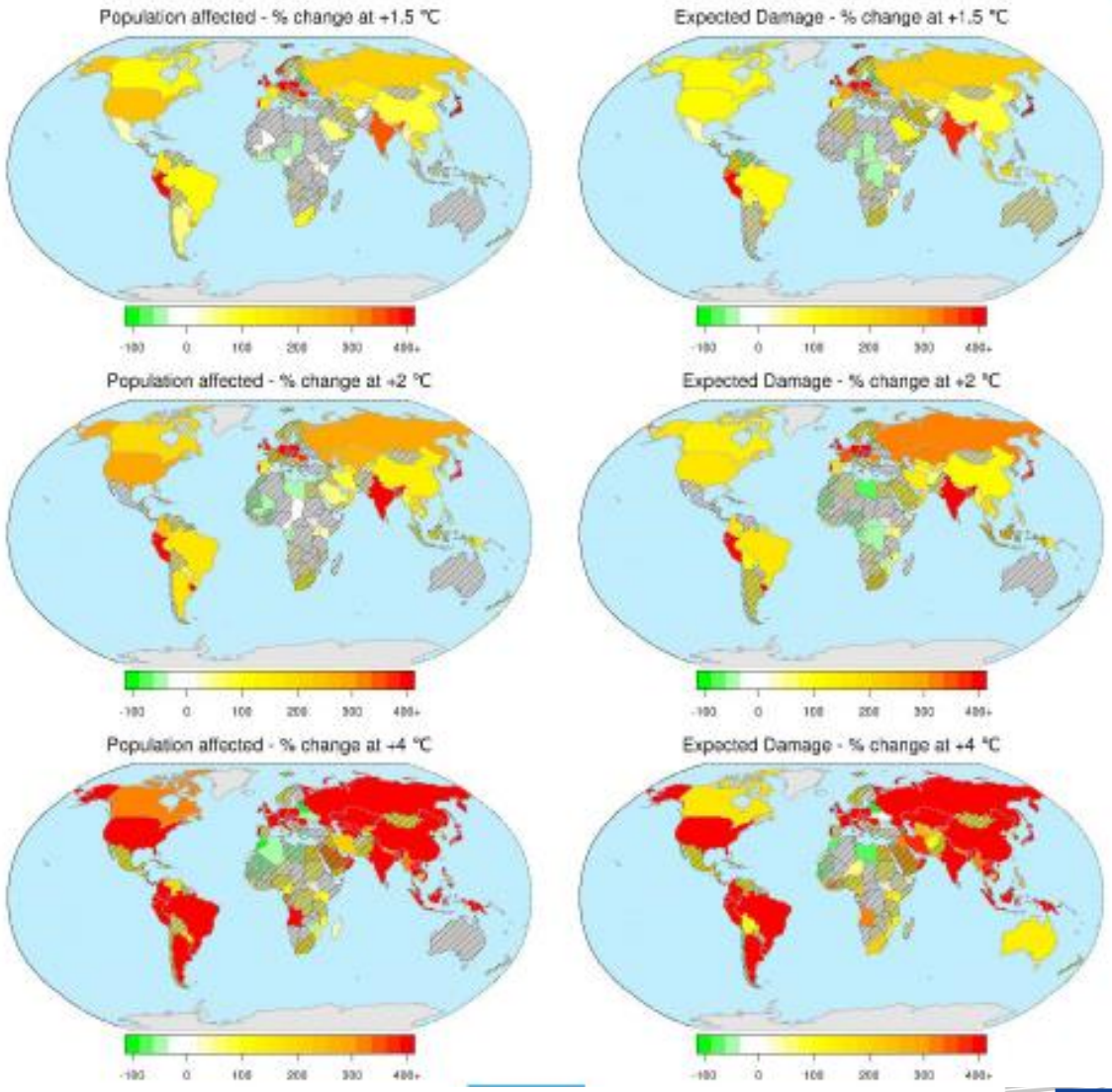
# 1. Identification of current and future climatic hazards

- Floods:
  a. River floods
  b. Flash floods
  c. Coastal floods
- Droughts
- Wildfires/Forest fires
- Wind storms
- Heatwaves
- Cold waves
- Landslides
- Avalanches
- Sea level rise

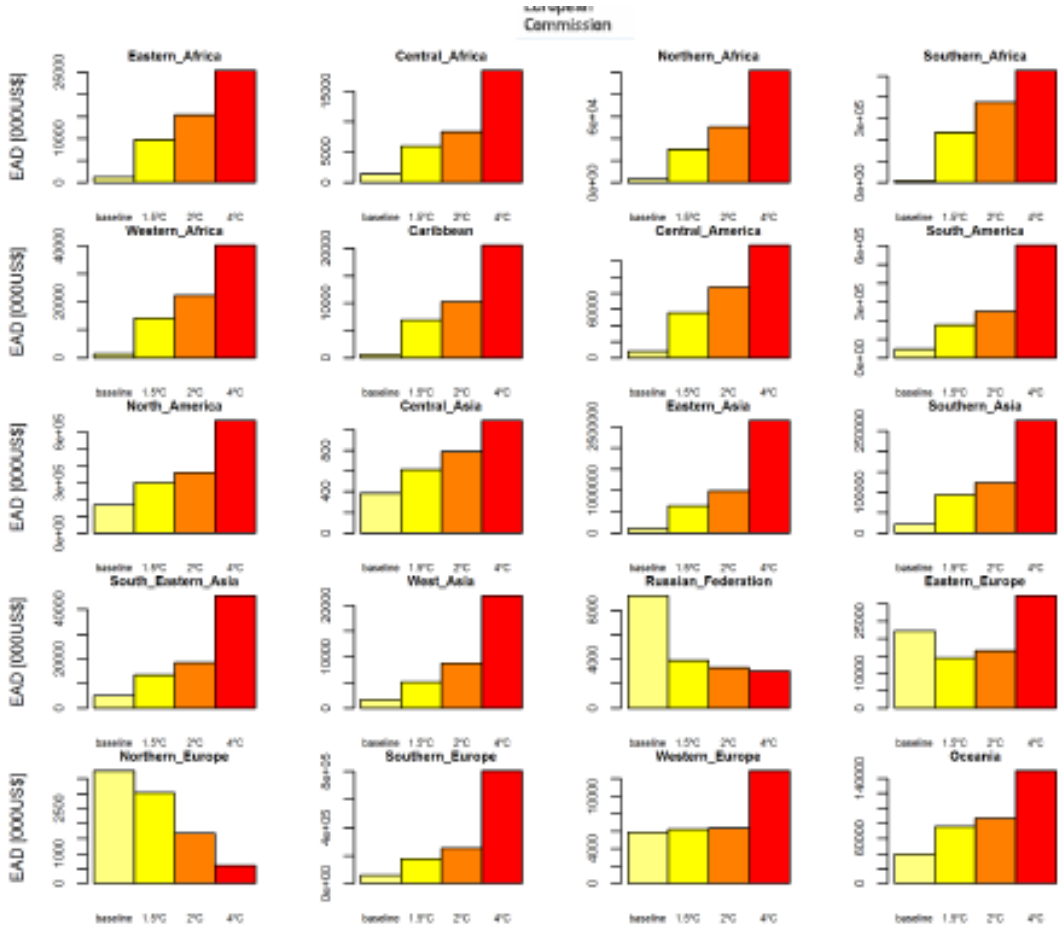
*Source:* Ciscar et al., 2014.


(IPCC, AR5)
IMPACTS
CLIMATE
Natural Variability
Anthropogenic Climate Change
Hazards
Vulnerability
RISK
Exposure
SOCIOECONOMIC PROCESSES
Socioeconomic Pathways
Adaptation and Mitigation Actions
Governance
EMISSIONS and Land-use Change

# Flood loss per warming levels



# Global drought losses per warming levels



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## 2a. Identification of critical infrastructure

1. Communication technologies
2. Education
3. Energy
4. Healthcare systems
5. Heavy industries
6. Security
7. Transport
8. Waste treatment
9. Water

*Source:* EEA, 2012; Forzieri et al., 2015; IPCC, 2014; OJEU, 2008.

## 2b. Essential requirements for critical infrastructure

1. An inventory of all critical infrastructure available within the Municipality.

2. An inventory of all critical infrastructure located beyond the city boundaries that may put the city at risk under climatic disaster events (e.g. heavy industries).

3. Level of risk for each critical infrastructure facility.

*Source:* EEA, 2012; Forzieri et al., 2015; IPCC, 2014; OJEU, 2008.

## 3a. Active Stakeholder Participation

1. Experts in climate change.
2. Public sector:
   - Planning authorities.
   - Authorities concerned with disaster risk management.
3. Private sector:
   - Business organisations.
   - Trade unions.
4. Other stakeholders:
   - NGOs.
   - Citizens concerned with disaster risk management.

*Source:* EEA, 2016; Hernández et al., 2016.

## 3b. Essential requirements for participation

1. Inventory of all relevant stakeholders and the level of participation (see the definitions in the annex):

   - **Level 1: Involvement.**
   - **Level 2: Collaboration.**
   - Level 3: Delegated power.
   - Level 4: Citizen control.

2. A list of stakeholders that did not participate and an explanation of their reasons.

*Source:* Arnstein, 1969; IAP2, 2017.

# 4a. Avoid maladaptation: a definition

1. «Action taken ostensibly to avoid or reduce vulnerability to climate change that impacts adversely on, or increases the vulnerability of other systems, sectors or social groups» (Barnett and O'Neill, 2010, p. 211).

2. «A result of an intentional adaptation policy or measure directly increasing vulnerability for the targeted and/or external actor(s), and/or eroding preconditions for sustainable development by indirectly increasing society's vulnerability» (Juhola et al., 2016, p. 136-137).

*Source:* Barnett and O'Neill, 2010; Juhola et al., 2016.

# 4b. Five types of maladaptation and examples

1. **Increasing GHG emissions**: energy-intensive air conditioners in response to heat waves, or desalination plants for water supply based on fossil fuel production.
2. **Burdening the most vulnerable**: adaptation actions that imply increasing prices to lower income families.
3. **High opportunity costs**: adaptation actions with higher economic, social, and environmental impacts than other alternative actions.
4. **Reduce incentive to adapt**: rebound effects, e.g. the introduction of new technologies that reduce water prices, inducing water consumption.
5. **Inducing path dependency**: large capital commitments, leading to paths difficult to change in the future, e.g. large infrastructural investments with high opportunity costs.

*Source:* Barnett and O'Neill, 2010.

# 5. Estimate implementation action costs

1. An estimation of the investment and maintenance costs of all proposed adaptation actions. There should not be an action without its correspondent cost estimation.

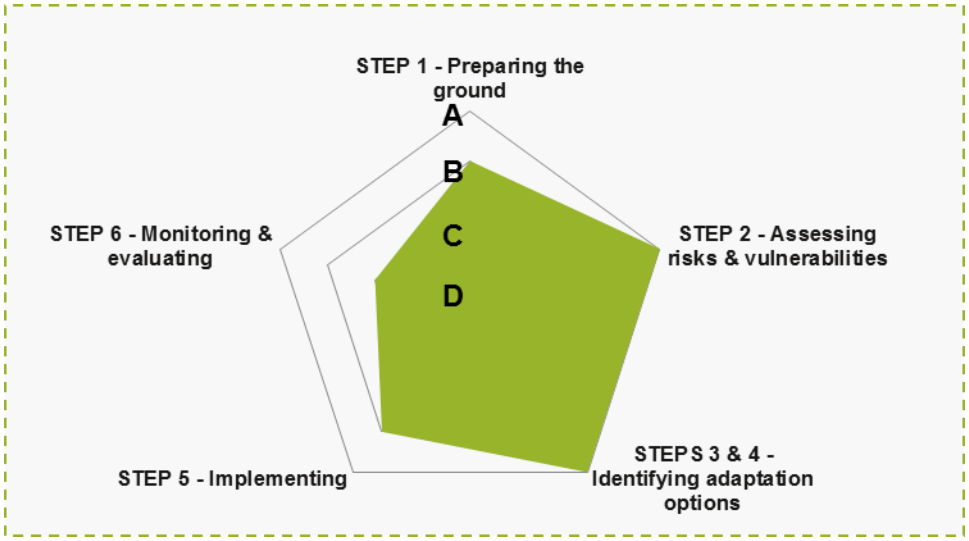
2. Adaptation actions should have a time horizon for their implementation.

3. Actions should have allocated funding.

*Source:* EEA, 2016.

# Adaptation self- assessment
# QUALITATIVE APPROACH

## Overview of the capacity, status and principals of the Risk and vulnerability study developed




*From SECAP of GHENT (Belgium)*

# RISK and VULNERABILITIES ASSESMENT

## Summary of the risk and vulnerability assessment developed and submitted by the signatory

- Qualitative systems
- Drop menu based
- Main sections:
  - Climate hazard
  - Vulnerabilities
  - Impacts

| Climate Hazard Type | | Current hazard risk level | Expected change in intensity | Expected change in frequency | Timeframe | Risk-related indicators |
|---|---|---|---|---|---|---|
| Extreme Heat | | Low | Increase | Increase | Long-term | |
| Extreme Cold | | | | | | |
| Extreme Precipitation | | Moderate | Increase | Decrease | Medium-term | |
| Floods | | Moderate | Increase | Increase | Medium-term | Pluvial flooding |
| Sea Level Rise | | Moderate | Increase | Increase | Medium-term | |
| Droughts | | | | | | |
| Storms | | Moderate | Decrease | Decrease | Medium-term | Severe wind, rain storm |
| Landslides | | | | | | |
| Forest Fires | | | | | | |
| ther | [please specify] | [Drop-Down] | [Drop-Down] | [Drop-Down] | [Drop-Down] | |

rows that do not concern your local ⓘ To be completed for the climate hazards that concern your local authority only. ⓘ Click here to see examples of risk-related indicators

***From municipality of Bologna SECAP***

# Adaptation actions

## Five key requirements

1. **Identification of current and future climatic hazards**
2. **Identification of critical infrastructure**
3. **Active stakeholder participation**
4. **Avoid maladaptation**
5. **Estimate implementation action costs**

# Adaptation actions

## Summary of the adaptation actions proposed in the plan

## Same scheme as for mitigation
## Synergies with mitigation

### Adaptation Actions

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2) Adaptation Actions

ⓘ List your adaptation actions in the table below. Actions can be comprehensive or representative, taken from one or more of the documents cited by the local authority in the section above.

| Sector | Title (max. 120 chars) | Short description (max. 300 chars) | Responsible body/department | Implementation timeframe | | Implementation status | Select as Key Action (☼) | Sta |
|---|---|---|---|---|---|---|---|---|
| | | | | Start | End | | | |
| Other | Developing indicators for monitoring, review and risk prevention within the Municipal Strategy for Adaptation to Climate Change (EMAAC) | It allows you to frame the future response to all kinds of events, impacts and vulnerabilities identified for the municipality. | Municipality of Barreiro | 2016 | Not known | Ongoing | [Please select] | |
| Water | Monitoring and analysis of the Tagus-Sado aquifer, incorporating the potential impacts arising from climate change (lack of scenarios and / or contamination of the aquifer - only producer of drinking water in the region) | Regional study in order to assess / monitor the Tagus-Sado aquifer for research on the potential effects of climate change on groundwater | Municipality of Barreiro | 2016 | Not known | Ongoing | [Please select] | |
| Other | Education and awareness of adaptation to climate change in schools and for the general population | Awareness of the impacts generated by the climatic events that affect the municipality of Barreiro, and better perception of the type future vulnerabilities, responses and adaptation needs the most significant (sea level rise, excessive rainfall, strong winds and heat waves). | Municipality of Barreiro | 2016 | Not known | Ongoing | [Please select] | |
| Land Use Planning | Systems of water retention basins, the | Promoting a naturalized infrastructure in some cases with double function, retention of rainwater and leisure, will allow for a sustainable solution | Municipality of Barreiro | 2011 | Not known | Ongoing | [Please select] | |

***From municipality of Barreiro SECAP***

# Access to Energy

- *Pillar to be integrated in the system*
- *Energy poverty?*
- *Sustainable energy?*
- *Affordable enegy?*
- *Secure access to energy?*
- *Diversification*
- *Targets? Sectors?*

# Stay in touch

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