

Imre Csikós

# A > 2C world and WB: How does it look in 2100

## Monitoring and evaluation

## How to identify indicators



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# Scope of presentation

1. > 2C: What will likely happen in the next decades?
2. Monitoring and Evaluation of adaptation measures / methods
3. How to identify indicators for adaptation

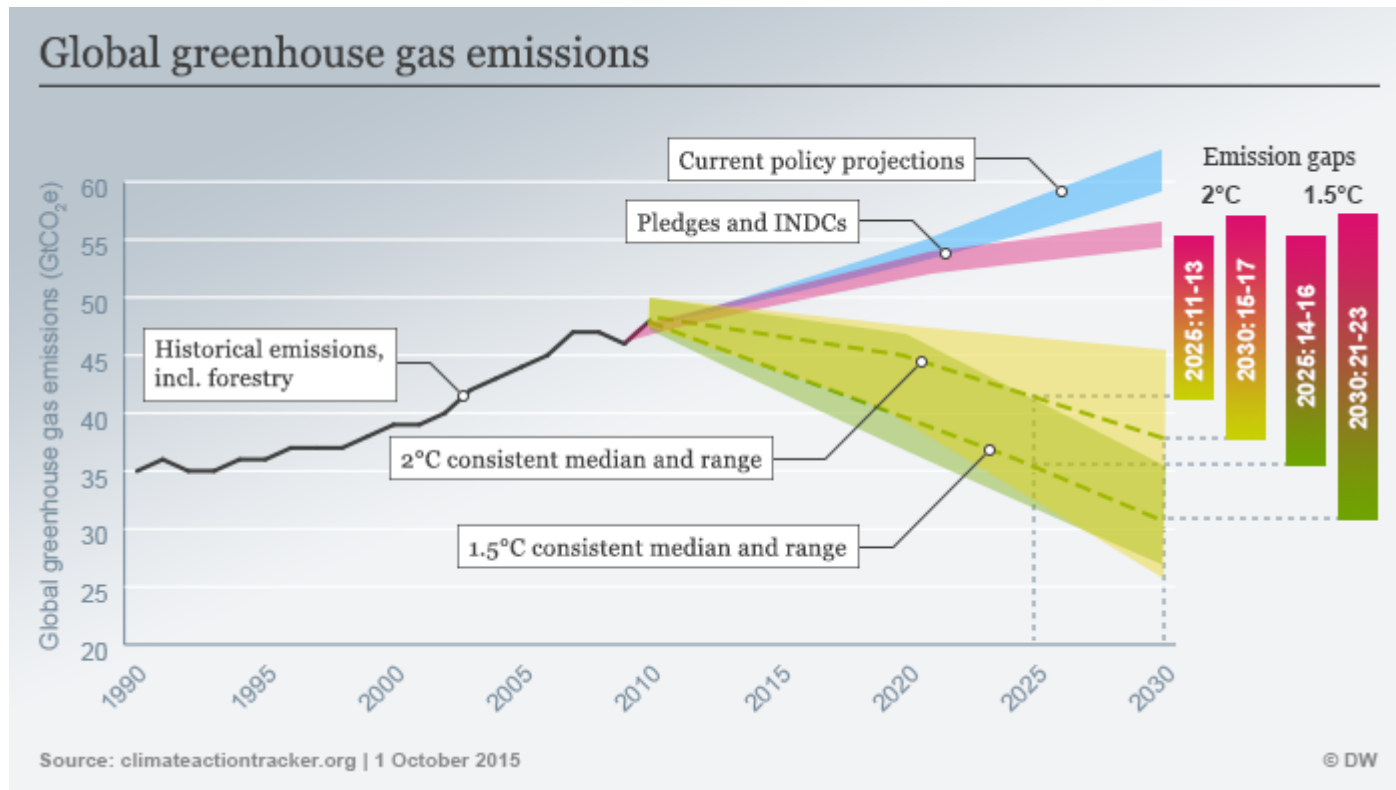


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# Paris made us safer but not safe

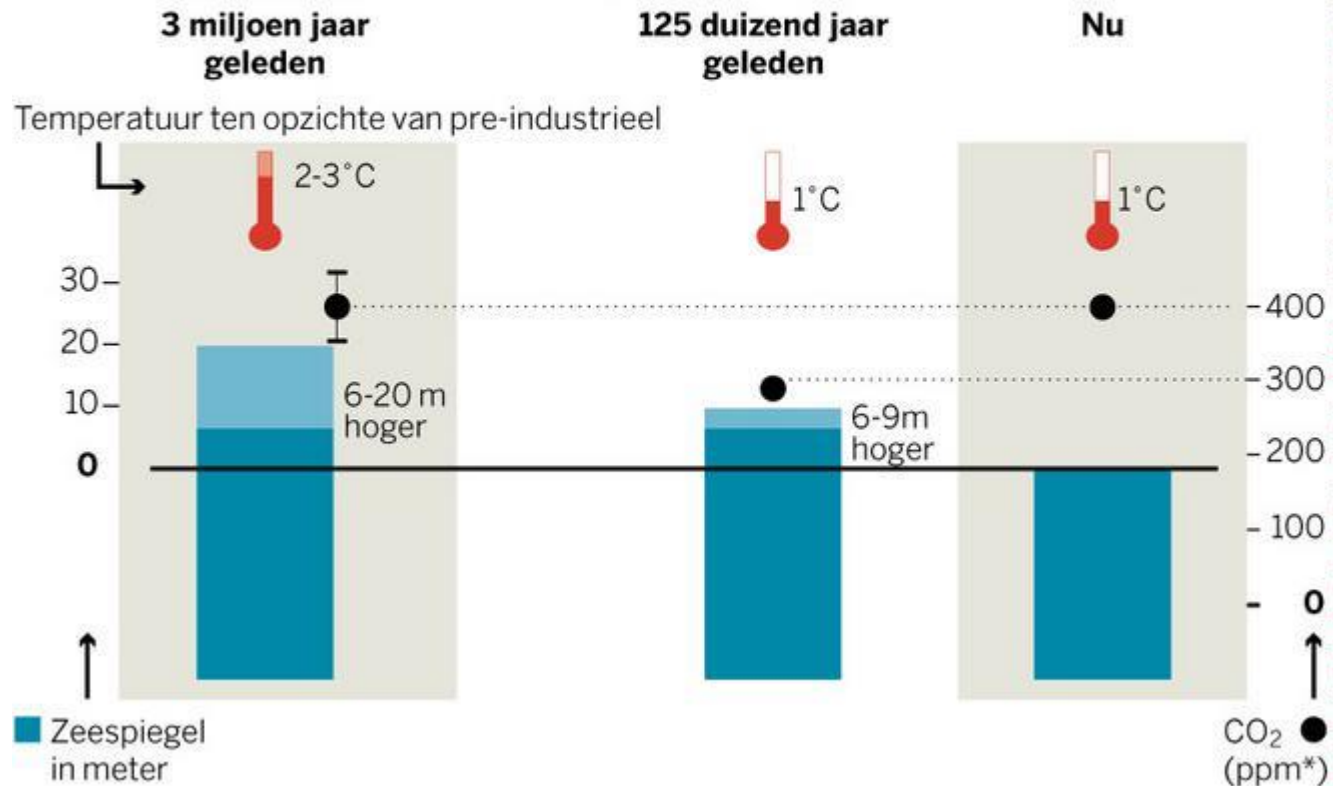


**Probability of > 4C reduced by 80%; 2.7C-3.5C likely outcome**

# The need to keep temperatures well below 2C

## Gevolgen opwarming erger

Het klimaat 3 miljoen jaar geleden, 125 duizend jaar geleden en nu. Tegenwoordig ziet men meer overeenkomsten met 3 miljoen jaar geleden.



271115 © de Volkskrant. Bron: Science \* deeltjes per miljoen

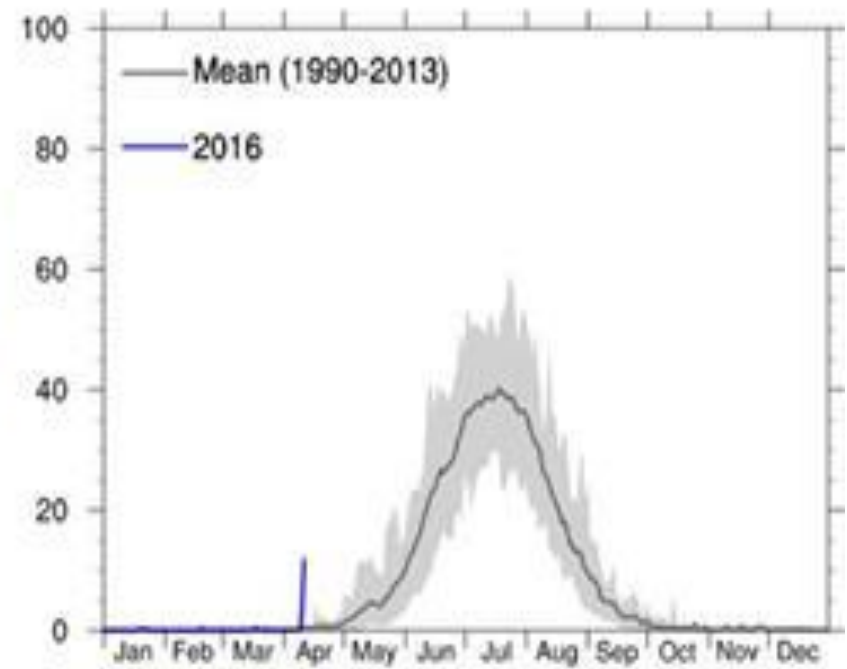
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2016 10/4 - Melt today (>1mm): 4 %

2016 11/4 - Melt today (>1mm): 12 %



# Impact of current emissions ?



2 billion people  
with increased  
water scarcity

10-12 billion  
people/year  
exposed to  
heatwaves



70-90 million  
people/year  
affected by river  
flooding

Cooling  
demands 2x



50% of plant  
species lose >  
half habitat

60% of cropland  
less suitable for  
agriculture



Source: AVOID 2



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# Some global benefits

- Some water-stressed people may have more water
- Some flood-prone people could be flooded less frequently
- Some cropland would see an improvement in suitability for agriculture
- Higher CO<sub>2</sub> concentrations could improve the productivity of some crops



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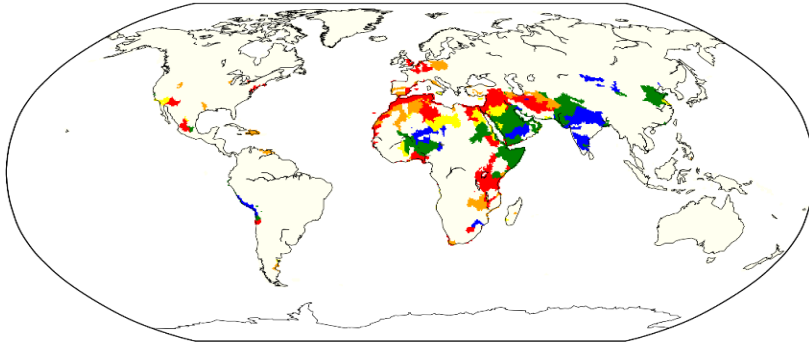


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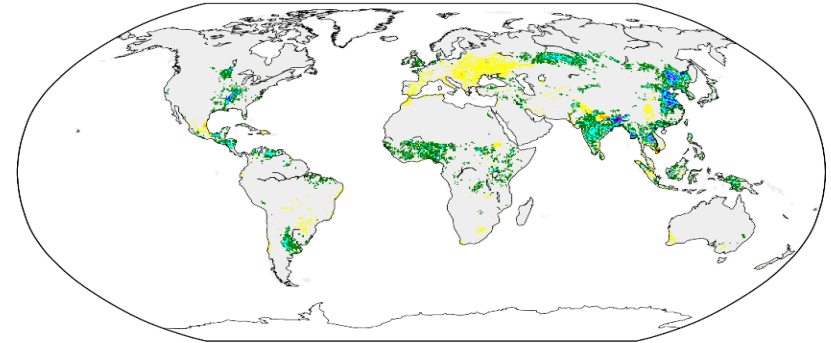
# ....But impacts vary between regions

Change in water stress  
HadGEM2 2100 RCP8.5



■ Increase in stress    ■ Become stressed    ■ No change  
■ Decrease in stress    ■ Move out of stress    ■ Not stressed

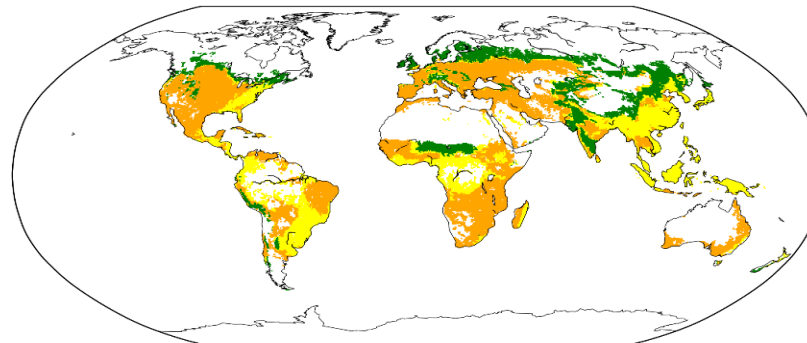
River flood risk  
HadGEM2 2100 RCP8.5



Change in average annual number of people flooded (thousands)

■ < -10    ■ -10 to -1    ■ -1 to +1    ■ 1 to 10  
■ 10 to 50    ■ 50 to 100    ■ >100

Change in crop suitability  
HadGEM2 2100 RCP8.5



■ Decline    ■ No change    ■ Improvement

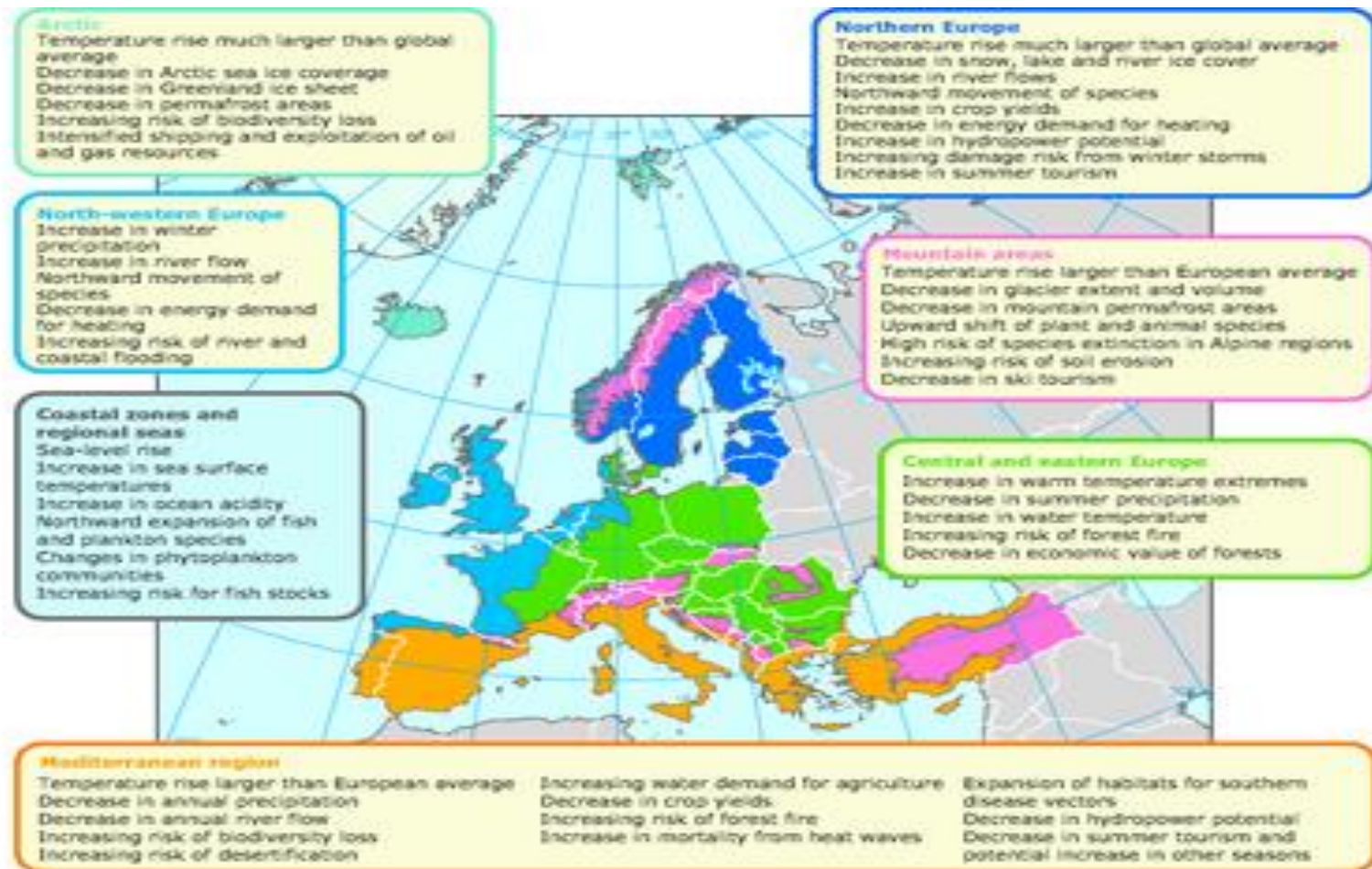
Source: AVOID 2



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# ....But impacts vary between regions



# Climate Challenge Western Balkans

## in a > 3.5 – 4 C world by 2100

1. The Western Balkans emerges as one of the planet's **Warming Hot Spots**, with more frequent heat waves, escalating to as much as 80% of summer months
2. The mean average summer temperature could climb **to 7.5C** above pre-industrial times. As climate warms the area's **Small Glaciers** will be gone within decades.
3. **Rainfall** is projected to decline 20–30%
4. The increasing occurrence (by 20%) of **Drought Days** will be a major threat to agriculture.
5. **Water Availability** in summer is expected to decrease through the century.
6. **Winter and Spring Flood Risk** is expected to increase, particularly along the Danube, Sava and Tisza rivers
7. **Crop Yields in FYR Macedonia** alone could drop by 50% by 2050 as the temperature climbs.
8. **Hydropower** which plays an important role in the region's electricity supply, will be at risk. In Albania for example the annual average output from large hydropower plants could be reduced by 15% and 20% for smaller plants.
9. **Health Risks** will grow as the climate warms with the growing threat of dengue fever. Heat-related mortality would increase 20% to 1,000 per million people.



# Principles of successful adaptation

Principles	Description
Effectiveness	An effective intervention is one that achieves its stated objectives: reducing risk, building adaptive capacity or increasing resilience. An 'effective' adaptation is flexible – to change in response to altered circumstances—and therefore robust against uncertainty.
Efficiency	cost-effectiveness of a particular project.
Equity	socio-economic factors. Successful adaptation actions should not reinforce existing inequalities between communities, sectors or regions.
Legitimacy	Decisions must be accepted by participants and non-participants that are affected by these decisions
Sustainability	looking beyond project duration and its immediate impact.



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# Monitoring and Evaluation

The screenshot shows the 'European Climate Adaptation Platform' website. The header includes the EU flag, the platform name, and a search bar. A navigation menu lists 'About', 'Search the database', 'EU policy', 'Countries, regions, cities', 'Knowledge', 'Network', and 'Help'. The breadcrumb trail indicates the user is at 'Home / Adaptation Support Tool / AST Step 6'.

A circular diagram on the left shows the 'Adaptation support tool' with steps 1 through 6. Step 6, 'Monitoring and evaluation', is highlighted. Below this, a list of steps is provided: 1. Preparing the ground for adaptation, 2. Assessing risks and vulnerabilities to climate change, 3. Identifying adaptation options, 4. Assessing adaptation options, 5. Implementation, and 6. Monitoring and evaluation. Under step 6, specific tasks are listed: 'Develop appropriate M&E provisions for your policy's objectives and adaptation options', 'Identify indicators', and 'SELF-CHECK'.

The main content area for 'Monitoring and evaluation' includes a paragraph explaining that adaptation is an iterative process requiring close monitoring and regular review. It states that monitoring the effectiveness of adaptation options and plans is ongoing and aimed at ensuring initiatives are working and identifying needed changes or refinements. A 'Read more' link is provided.

Below the paragraph, there are two columns of links. The 'Guidance and tools' column includes: 'The adaptation indicator framework for Scotland', 'Making Adaptation Count, Concepts and Options for Monitoring and Evaluation of Climate Change Adaptation', and 'AdaptME toolkit - Adaptation Monitoring & Evaluation'. The 'Publications and reports' column includes: 'Learning to ADAPT: monitoring and evaluation approaches in climate change adaptation and disaster risk reduction – challenges, gaps and ways forward', 'Evaluation of implementation of the National Strategy, Finland', 'Climate change adaptation-related indicators', 'Adapting to climate change in the UK - measuring progress', and 'Adapting to Climate Change'.

At the bottom, there is a section for 'City specific information and guidance' with a link to 'The Integrated Management for Local Climate Change Response: Capacity'.



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# Objective of Monitoring and Evaluation

1. Tracking and **reporting** of adaptation policy progress and effectiveness
2. **Learning** for improving adaptation policies, policymaking and practices
3. **Increasing accountability** provide evidence of policy effectiveness and to assess whether or not adaptation investments represent appropriate use of public funds (efficiency).
4. Improve **knowledge/awareness** and communication



# Essential building blocks for an effective M&E

1. **Legal and Institutional**: Appropriate M&E provisions for both your adaptation policy's objectives and selected adaptation options developed
2. **Legal and Institutional**: All stakeholders with a role and responsibility for implementation are involved in the M&E process
3. **M&E Methods**: The M&E approach is tailored to the type and scale of activity and the purpose is clearly communicated and agreed
4. **Indicators**: Appropriate indicators developed





# M & E methods:

M&E Methodology	Focus on	Approach
Risk, Cause-Impact evaluation	Vulnerability assessment	Elements of adaptive risk evaluated against a set of indicators
Evaluation of Institutional Change and management processes	Good Governance, management change, awareness and participation of stakeholders	Benefits of new management practices in terms of empowerment and ownership of actions





# M & E methods: Effectiveness and Efficiency are key principles

M&E Methodology	Focus on	Approach
Input-Output-Outcome evaluation	Effectiveness	Elements of adaptive capacity evaluated against a set of indicators
Economic evaluation	Efficiency	Benefits of adaptation is measured in terms of economic costs



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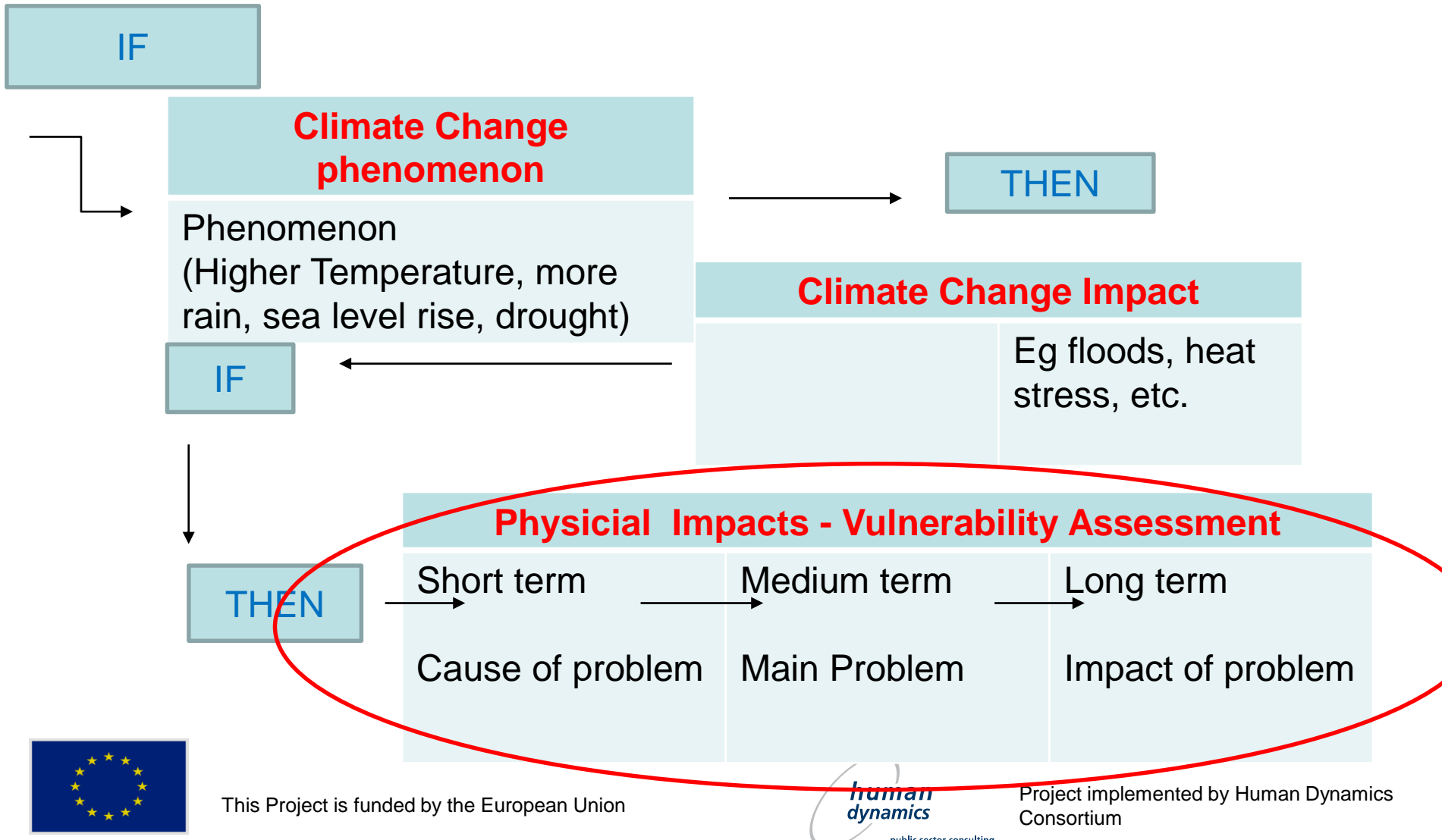
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# Essential steps to take towards indicators

1. **Vulnerability Assessments.** Problem Tree development
2. **Legal and Institutional assessment:**
3. **Stakeholders involvement :** All stakeholders with a role and responsibility for implementation are involved
4. **Intervention logic of adaptation actions (options):** problem tree made positive
5. **Prioritisation of options:** eg multicriteria analysis and selection of most promising options
6. **Indicators of achievement:** Appropriate indicators developed



# M & E methods: Intervention logic: Vulnerability Assessments



# Vulnerability Assessment – Negative Statements

→ **THEN** Effect/Impact of problem of problem:  
People are thirsty and health impact

→ **IF** Main problem:  
→ People have no drinking water

→ **IF** Cause of problem:

- No wells
- No potable water



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# Intervention logic/ Outcome of adaptation actions

## Positive Statements

→ **THEN** Wider objective :  
Thirst satisfied, people healthy

→ **IF** Immediate objective :  
drinking water available

→ **IF** result :

- Wells available
- Potable water storage

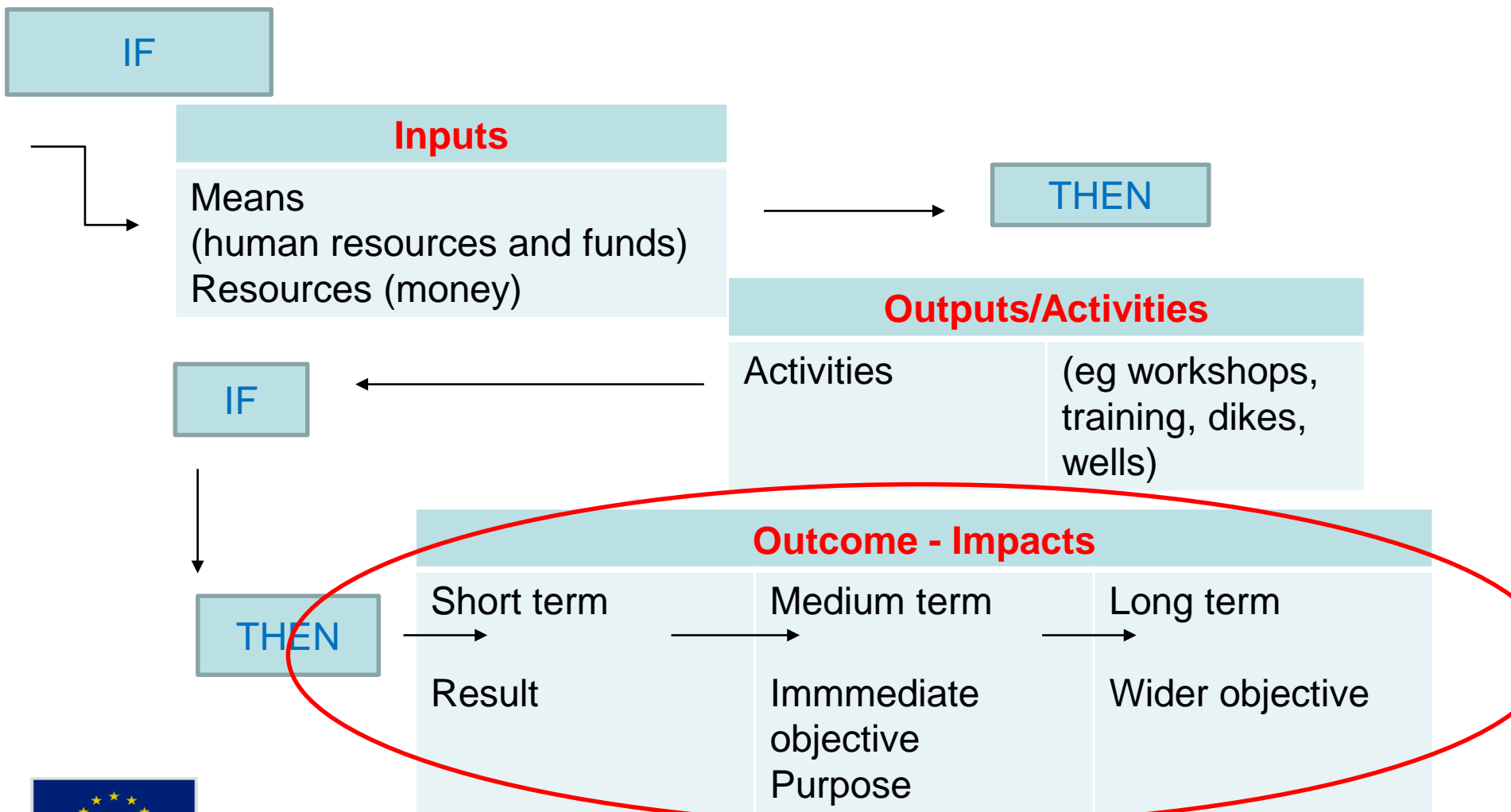


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# M & E methods: Intervention logic: input – Output - Outcome



# Adaptation project/Negative statements

→ **THEN** Effect/Impact of problem:

*Loss of economic integrity of area and crumbling infrastructure (recurring damages)*

→ **IF** Main problem:

*Housing areas collapse following recurring flash floods*

**IF** Causes of problem:

- *No room for water in river bed (too narrow river bed)*
- *No sufficient protective dikes*



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# Adaptation project/Positive statements

→ **THEN** Wider Objective:

*Economic and social integrity of area maintained under more water stress*

→ **IF** Immediate Objective:

*Housing areas remain: Flooding risk contained/decreased*

→ **IF** Result :

- *Increased Room for water in river bed*
- *Protective dikes*



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# Indicators

1. Should **be associated** with the outcome (results, immediate objectives and wider objective)
2. They should be SMART (Specific, Measurable, Accurate, Realistic, Time bound)
3. In more simple terms:
  - **What?**
  - **Where?**
  - **When?**



# Objective of Monitoring and Evaluation

Outcomes	Indicators
Wider Objective: <i>Economic and social integrity of area maintained under more water stress</i>	
Immediate objective: <i>Housing areas maintained, Flooding risk contained/decreased</i>	
Result 1: <i>Increased Room for water in river bed</i>	



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# Objective of Monitoring and Evaluation

Outcomes	Indicators
Wider Objective: <i>Economic and social integrity of area maintained under more water stress</i>	GDP growth ( <i>what?</i> ) in area xyz ( <i>where?</i> ) in period To – Tn ( <i>when?</i> )
Immediate objective: <i>Housing areas maintained, Flooding risk contained/decreased</i>	
<i>Result 1: Increased Room for water in river bed</i>	



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# Objective of Monitoring and Evaluation

Outcomes	Indicators
Wider Objective: <i>Economic and social integrity of area maintained under more water stress</i>	GDP growth ( <i>what?</i> ) in area xyz ( <i>where?</i> ) in period To – Tn ( <i>when?</i> )
Immediate objective: <i>Housing areas maintained, Flooding risk contained/decreased</i>	Flood risk reduced ( <i>what?</i> ) from 1 occurrence in 10 years to 1 in 500 years in area xyz ( <i>where?</i> ) as from year To ( <i>when?</i> )
<i>Result 1: Increased Room for water in river bed</i>	



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# Objective of Monitoring and Evaluation

Outcomes	Indicators
Wider Objective: <i>Economic and social integrity of area maintained under more water stress</i>	GDP growth ( <i>what?</i> ) in area xyz ( <i>where?</i> ) in period To – Tn ( <i>when?</i> )
Immediate objective: <i>Housing areas maintained, Flooding risk contained/decreased</i>	Flood risk reduced ( <i>what?</i> ) from 1 occurrence in 10 years to 1 in 500 years in area xyz ( <i>where?</i> ) as from year To ( <i>when?</i> )
<i>Result 1: Increased Room for water in river bed</i>	<ul style="list-style-type: none"> <li>Nr of relocated housing from floodbed completed in year To</li> <li>Floodplain on location xyz increased from x ha to x+y ha in year To</li> </ul>



# Objective of Monitoring and Evaluation

Outcomes	Indicators
Wider Objective: <i>Economic and social integrity of area maintained under more water stress</i>	GDP growth ( <i>what?</i> ) in area xyz ( <i>where?</i> ) in period To – Tn ( <i>when?</i> )
Immediate objective: <i>Housing areas maintained, Flooding risk contained/decreased</i>	Flood risk reduced ( <i>what?</i> ) from 1 occurrence in 10 years to 1 in 500 years in area xyz ( <i>where?</i> ) as from year To ( <i>when?</i> )
<i>Result 2: Protective dikes</i>	





# Objective of Monitoring and Evaluation

Outcomes	Indicators
Wider Objective: <i>Economic and social integrity of area maintained under more water stress</i>	GDP growth ( <i>what?</i> ) in area xyz ( <i>where?</i> ) in period To – Tn ( <i>when?</i> )
Immediate objective: <i>Housing areas maintained, Flooding risk contained/decreased</i>	Flood risk reduced ( <i>what?</i> ) from 1 occurrence in 10 years to 1 in 500 years in area xyz ( <i>where?</i> ) as from year To ( <i>when?</i> )
<i>Result 2: Protective dikes</i>	<ul style="list-style-type: none"> <li>Km of new dike on location xyz by year To</li> <li>Km of restored or reinforced dike on location xyz by year To</li> </ul>



# Get inspired: Indicators examples

(depending on adaptation measure)

## Damage Reduction

1. Infrastructure assets in flood risk areas with 'significant' risk of flooding (fluvial, coastal and pluvial) taking into account level of protection.
2. Nr Properties subject to unplanned water supply interruptions of 12 hours or more.

## Water Supply

1. Available water resources
2. Water saved through demand management measures
3. Take up of water efficient technologies



# Get inspired: Indicators examples

(depending on adaptation measure)

## Health and well being

1. Reduced summer mortality during heatwaves
2. Hospital admissions for temperature-related causes
3. Change in the extent of urban greenspace
4. Housing type and age

## Built environment and natural environment

1. Green versus manmade cover (proxy)
2. Changes in abundance of climate sensitive species
3. Nutrient levels in rivers and lake
4. Nr Forest fires





# Thank you



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