Practice II. Definition and operationalization of climate indicators

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Introduction to Climate indicators

Definition: climate indicators are quantitative measures used to monitor and assess changes in climate patterns over time

Purpose: they help in understanding and quantifying climate variability, change, and potential impacts on different sectors

Applications:		
Climate monitoring	Policy making	Sectoral adaptation (e.g., agriculture, tourism, water management)

Key Elements in Defining Climate Indicators

- Relevance: Choose indicators that align with specific research or policy objectives (e.g., temperature for heatwaves, precipitation for droughts)
- Stakeholder Engagement: Involve local stakeholders to ensure that indicators reflect the needs and concerns of the community (See example Climate services for tourism: An applied methodology for user engagement and co-creation in European destinations - ScienceDirect)
- Data Availability: Ensure that reliable and consistent data is accessible for the indicators

Steps to Operationalize Climate Indicators

1. Selection of Variables:
   - Identify the key meteorological or climate variables (e.g., Temperature, rainfall, wind speed)
   - Consider the availability and resolution of the data (e.g., ERA5, ERAland)

Steps to Operationalize Climate Indicators

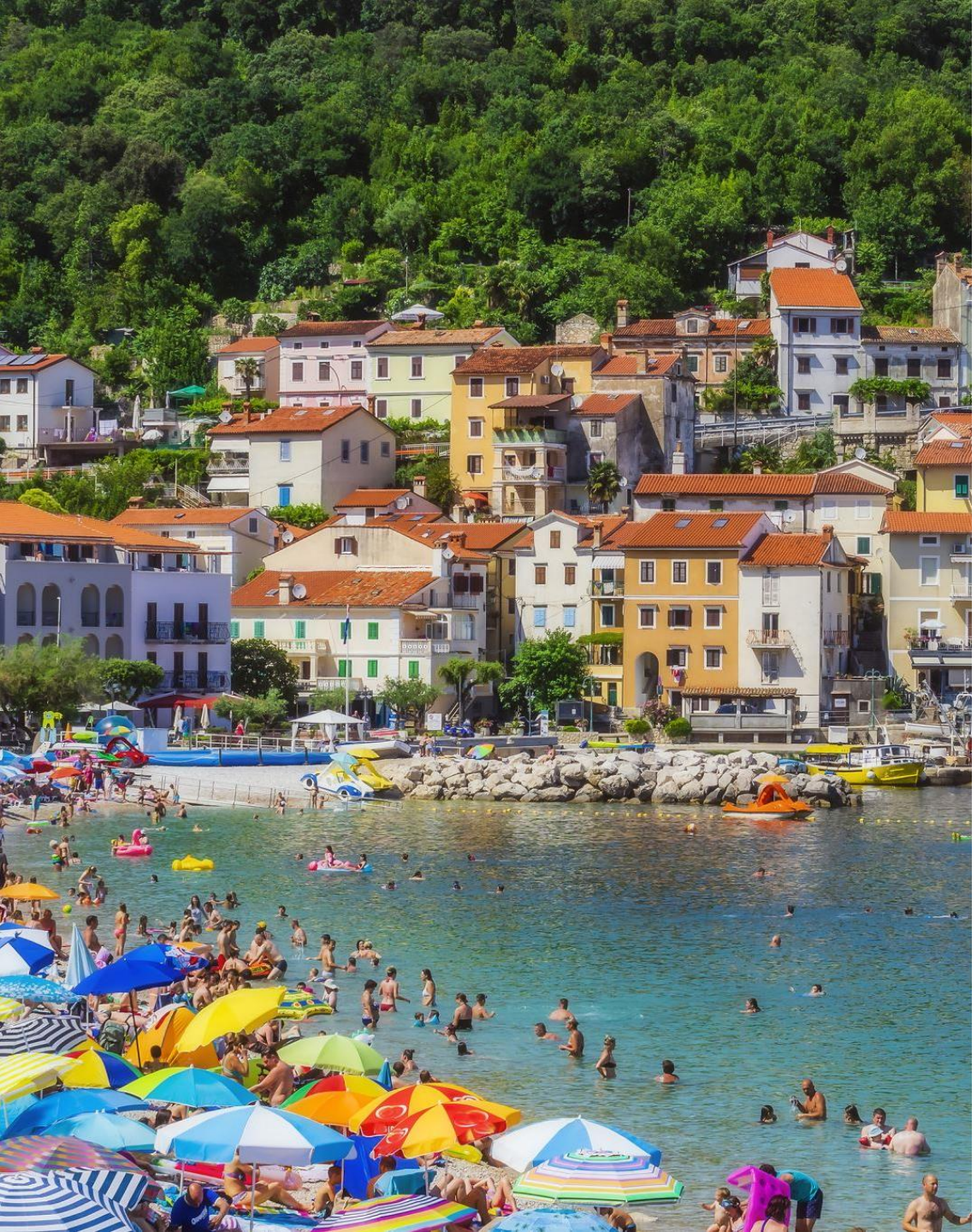
2. Setting Thresholds
    - Define thresholds for each indicator
    - Determine the thresholds based on scientific literature, historical data, and local expertise

Steps to Operationalize Climate Indicators

3. Spatial and Temporal Resolution
    - Decide on the spatial scale (e.g., regional, local) and temporal scale (e.g., daily, monthly)
    - Ensure the resolution fits the needs of stakeholders (e.g., tourism operators need daily data)

Steps to Operationalize Climate Indicators

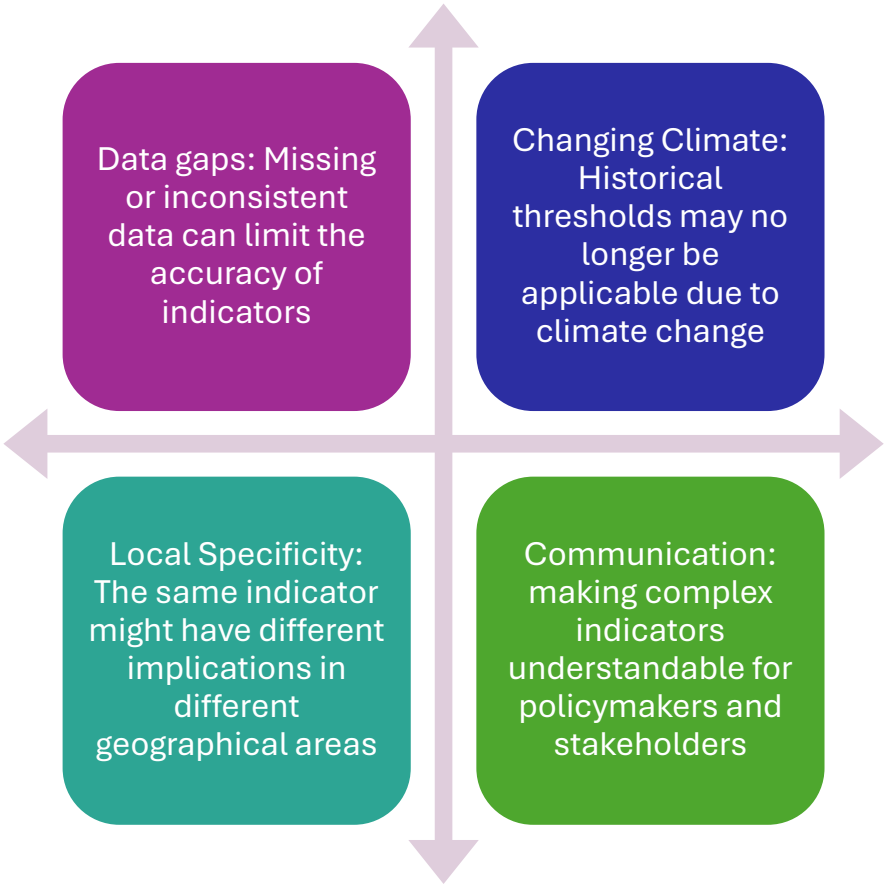
4. Index Development
    - Combine multiple variables into a single index if necessary (eg-. Temperature+ humidity for comfort index)



Example of Operationalized Climate Indicator for Tourism

- Objective: Monitor the suitability of the climate for beach tourism
- Variables:
  - Temperature (maximum and minimum)
  - Precipitation (daily)
  - Wind speed
  - Sunshine hours
- Thresholds:
  - Temperature (maximum and minimum)
  - Precipitation (daily)
  - Wind speed
  - Sunshine hours
- Index: a scale from 1 to 5, where 1 represents poor conditions and 5 represents excellent conditions for beach tourism

Challenges in Defining and Operationalizing Climate indicators



Conclusion

Importance of Defining Clear Indicators: Well-defined climate indicators are crucial for informed decision-making and adaptation planning.

Collaboration with Stakeholders: Continuous dialogue with stakeholders ensures the indicators meet real-world needs.

Ongoing Review: Indicators should be regularly reviewed and updated as new data becomes available or as climate conditions evolve.

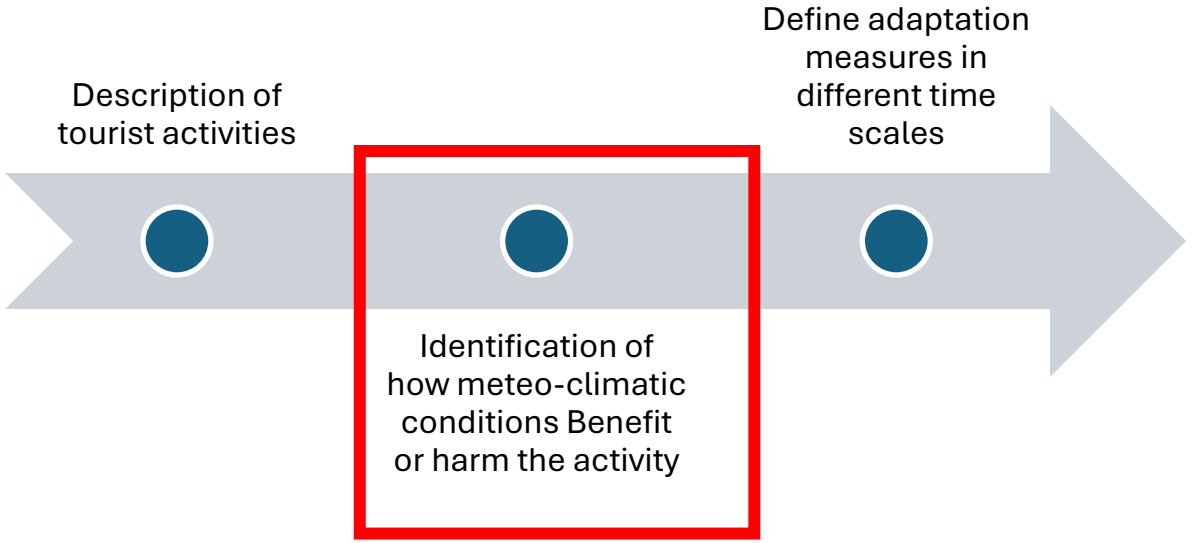
HANDS ON PRACTICE

HANDS ON PRACTICE: CO-CREATION OF CLIMATE INDICATORS

Objective: Apply the practical methodology for co-creating climate indicators, focusing on user engagement.

Approach: We will base our practice on **Step 2 of the methodology from "Climate Services for Tourism: An Applied Methodology for User Engagement and Co-Creation in European Destinations"**, which focuses on **defining thresholds and relevance criteria** for climate indicators based on the needs of local stakeholders.

3 Steps Co-creation Methodology



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Climate Services

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Climate services for tourism: An applied methodology for user engagement and co-creation in European destinations

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Second step

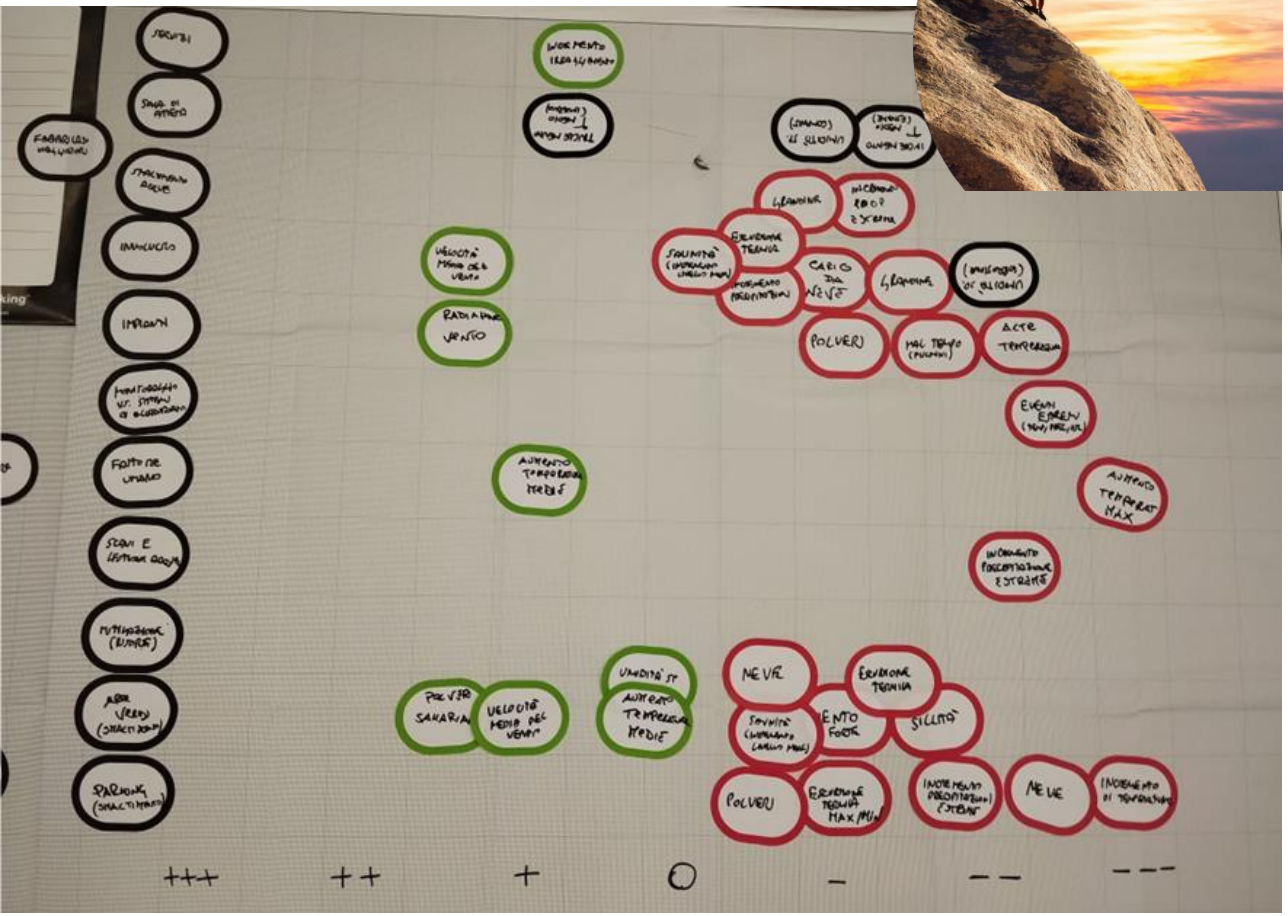
Step 1. Definition of the activity: periods of affluence, reasons for cancellation, time in advance of booking the activity

Step 2. Identification of weather conditions that affect the activity

Step 3. Establishment of strategies (on different time scales) in case of climate weather information

STEP 2. Identification of the degree of impact of meteorological and climatic conditions on the object of study

- **Define variable**
- **Define threshold if possible**



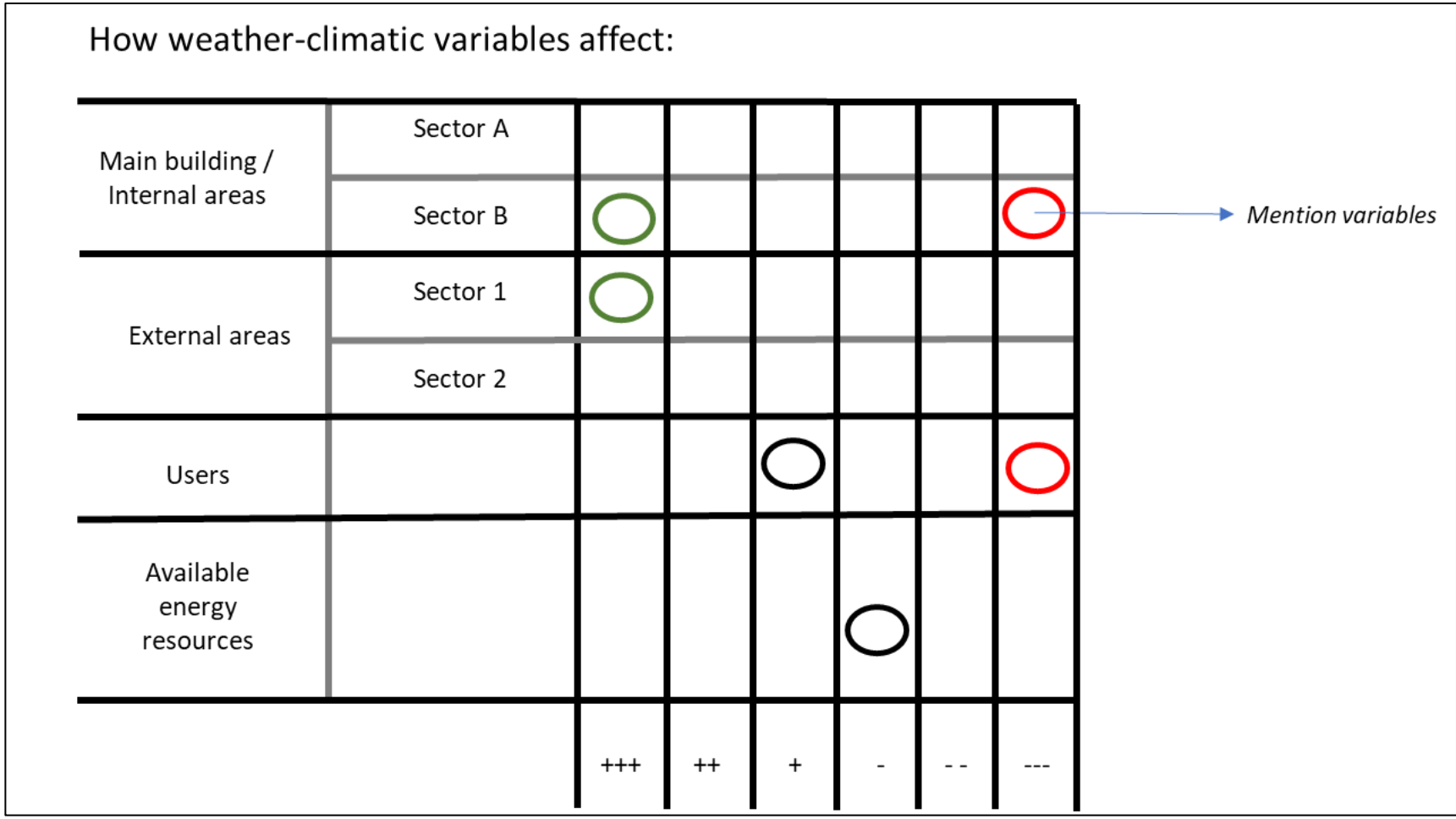
STEP 2. Identification of the degree of impact of meteorological and climatic conditions on the object of study

In Red: Conditions that negatively affect the activity

--- Conditions that require the activity to be cancelled

In Green: Conditions that positively affect the activity

+++ Optimal Conditions




Thanks for your attention!
Any questions?