



ESCWA

United Nations Economic and Social Commission for Western Asia

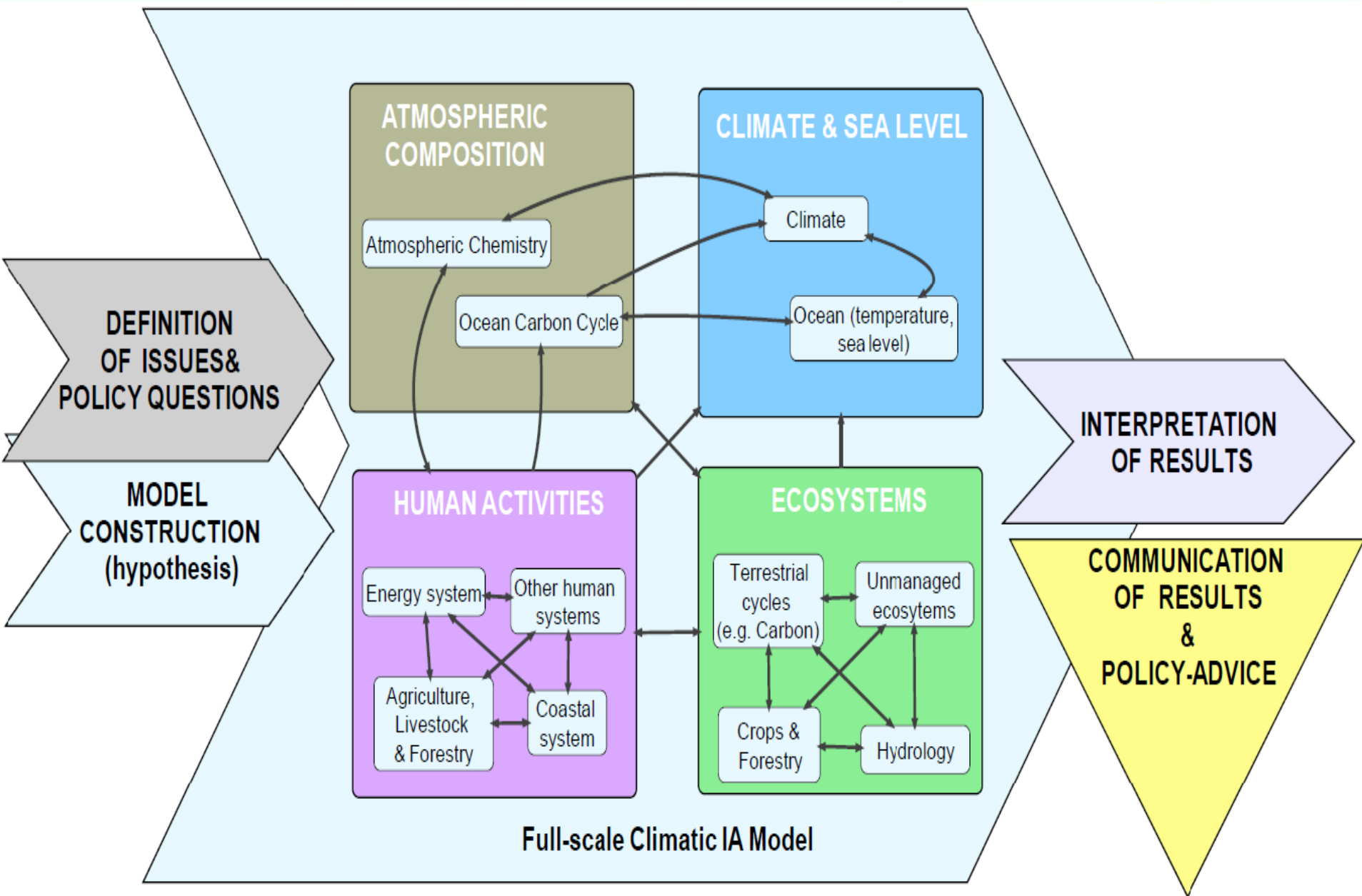
# Assessing the Impact of Climate Change on Economic Development Sector in the Arab Region

*“Structure” of Impacts, Challenges to Development, Macro-Economic Costs,*

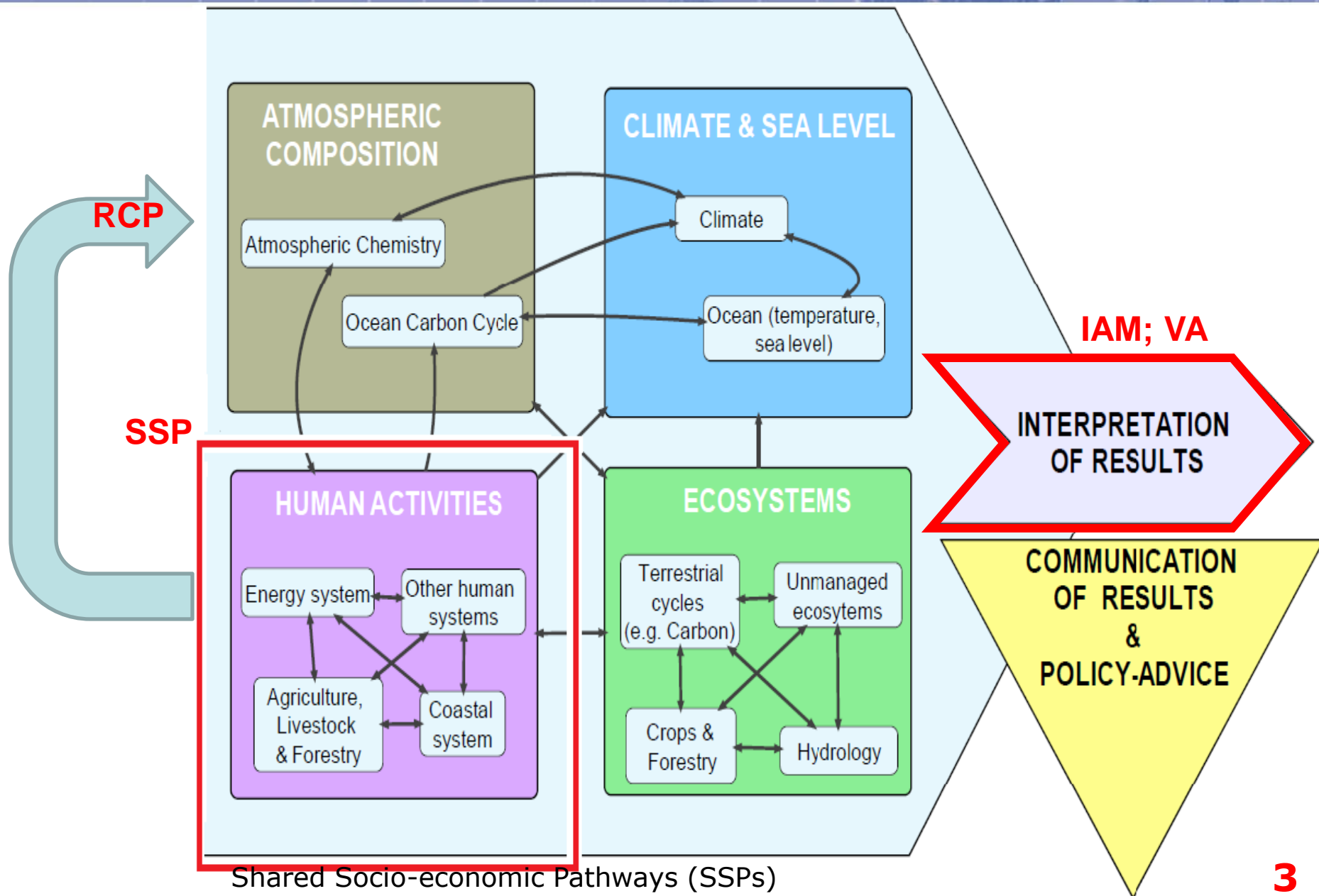
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# Analysis for Mitigation



# Analysis for Adaptation





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# Outline

1. “Structure” of Impacts
2. Challenges to Economic Development
3. Macro-Economic Costs

# Structure of Impacts



- Economy is sensitive to:
  1. Magnitude of change: *how much*
  2. Rate of change: *how fast*
  3. Increase in variability: *how often*
- 3 Key Parameters:
  - Temperature,
  - Precipitation,
  - Expected change in sea level.

# Structure of Impacts



- Economy is sensitive to:
  - 1. Magnitude** of change: *how much*
    - Change in rainfall: higher in the Arab Region.
    - Temperature apparently has the larger effect on the short to medium term outlook for economic development.
  - 2. Rate of change:** *how fast*
  - 3. Increase in variability:** *how often*

# Structure of Impacts



- Economy is sensitive to:
  1. Magnitude of change: *how much*
  2. **Rate** of change: *how fast*
    - Not well documented?
    - Will affect adaptation strategies  
*When you have to spend the money*
  3. Increase in variability: *how often*

# Structure of Impacts



- Economy is sensitive to:
  1. Magnitude of change: *how much*
  2. Rate of change: *how fast*
  3. Increase in **variability**: *how often*
    - Geographic variations within a country:
      - Algeria, Lebanon, Morocco, Tunisia, and Palestine
    - Transboundary water sources:
      - Egypt, Iraq, and the Syrian Arab Republic





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# Outline

1. “Structure” of Impacts
- 2. Challenges to Economic Development**
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# Three challenges



Need for additional investments: increases cost of doing business:

## **1. Change the underlying conditions:**

- New risks, New opportunities.

## **2. Greater weather variability:**

- Weather patterns deviate from previous stable patterns
- Insurance: Rapid Climate Change Events (RCCE)

## **3. Resources under increasing pressure**

# Mitigation and Adaptation

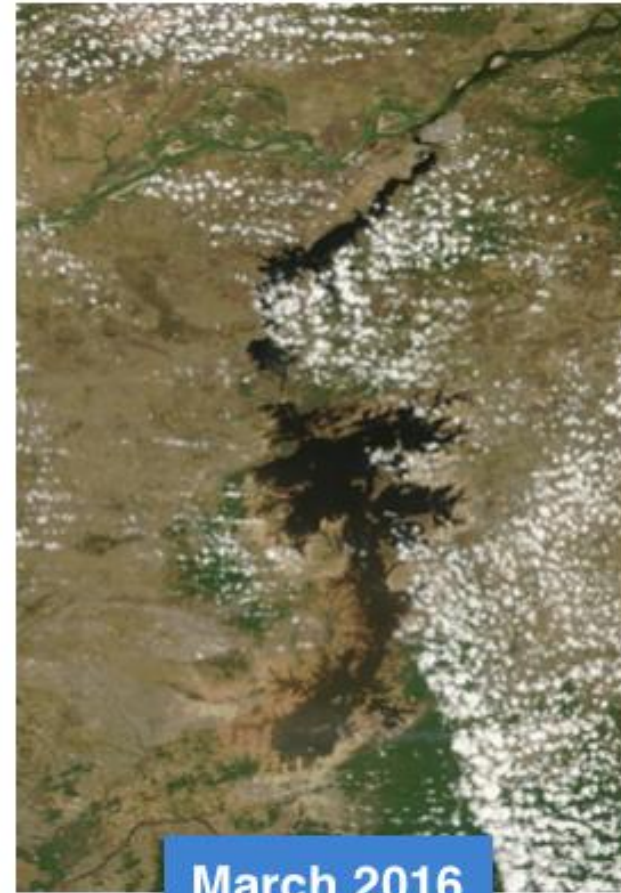


- At the global level;
  - mitigation is carried out to diminish the "forcings" that exacerbate climate change.
  - In the Arab region: little effect
  
- At the local level: Arab Region
  - Adaptation to address the impacts
  - Especially in resource-scarce regions

# Challenge: Water & Energy



## Drought impacts on Venezuela's Guri Reservoir & Caroni River





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# Outline

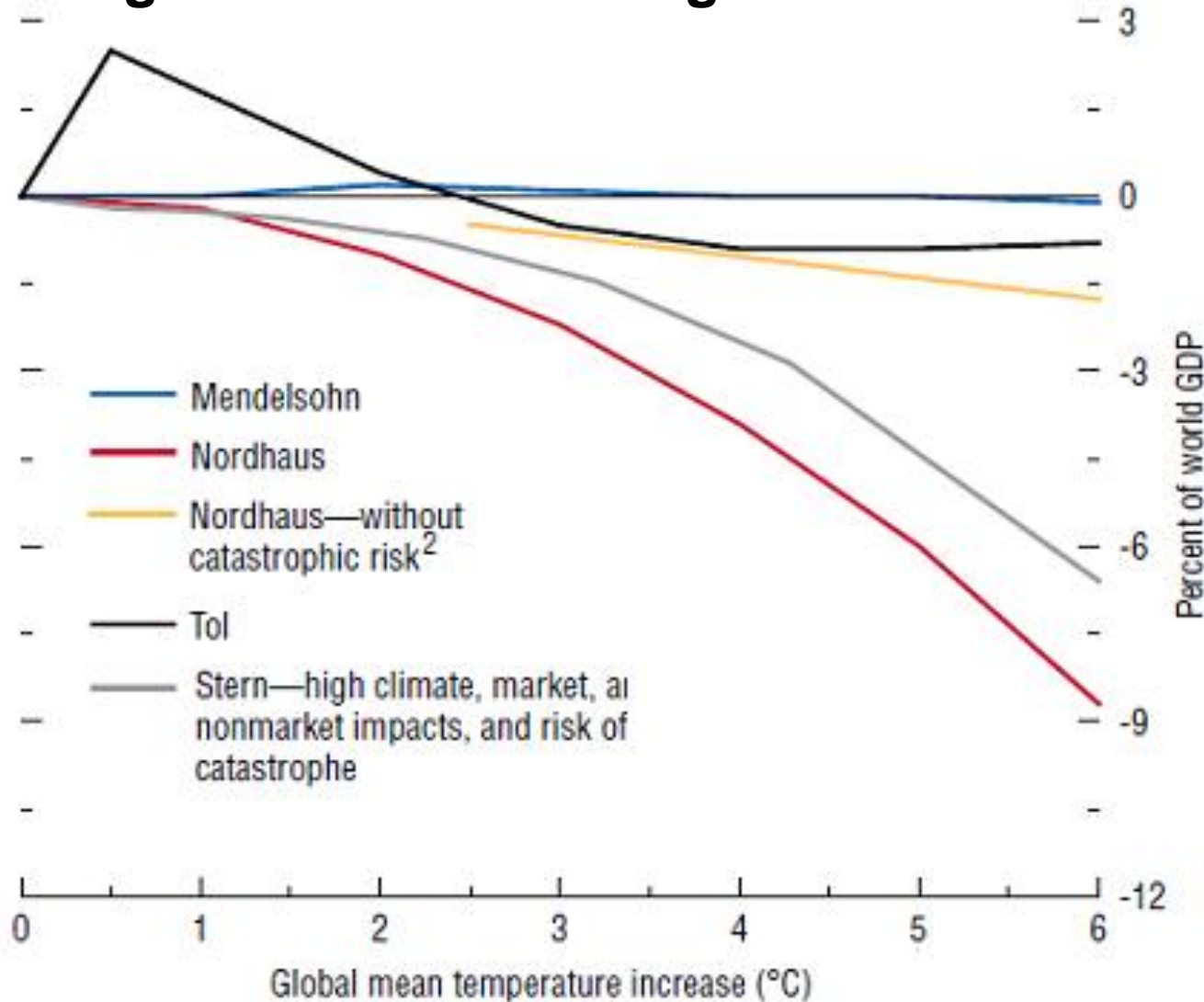
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# Macro-Economic Impacts



Estimates vary widely:

Focused on global level and mitigation needs:



# Macro-Economic Impacts



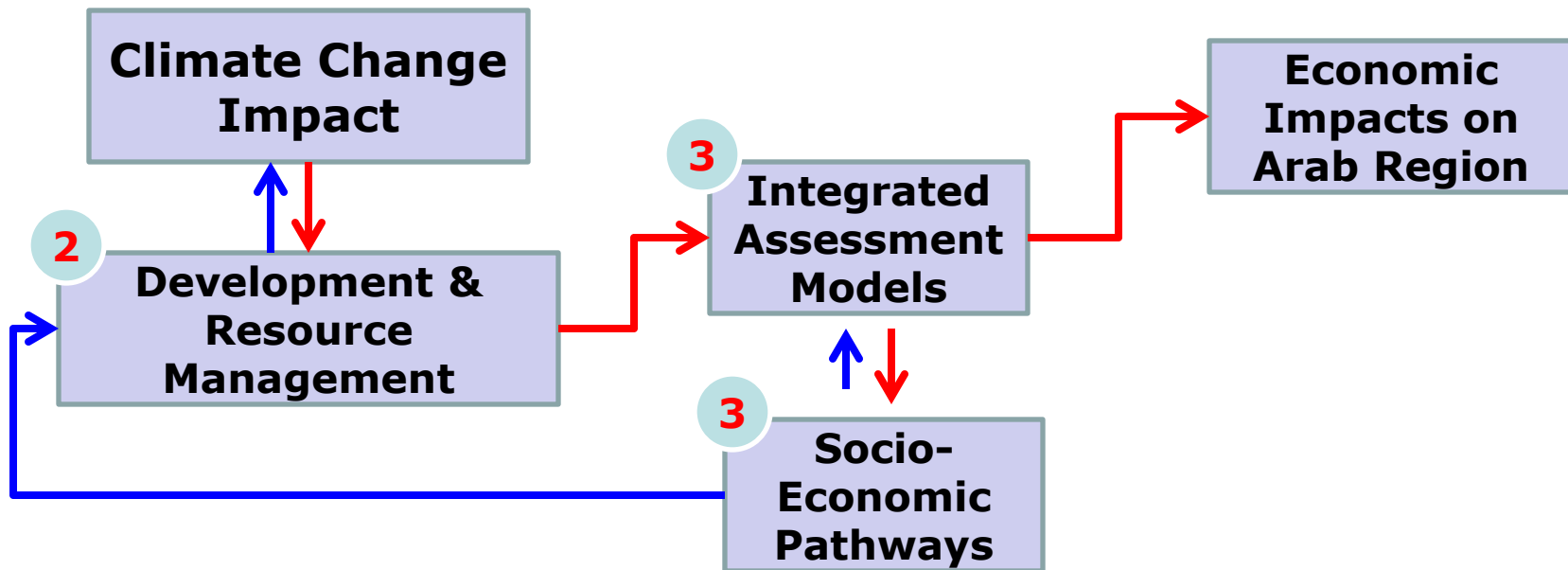
Study	Warming	Impact (% on GDP )	Comment
Mendelsohn, Schlesinger, Morrison and Andronova (2000)	2.0°C by 2080	A cumulative effect of a loss of 0.3% of GDP in 2080	Assuming 2°C of warming is reached by 2080, most damages will come from agriculture. OECD economies will gain from warming while the rest of the world will lose. Damages to individual countries do not always follow continental averages. The Ricardian model predicts much smaller losses and gains than the reduced-form model, predicting a 0.04% net gain to 2080 GDP levels from 2.0°C warming.
Mendelsohn, Schlesinger and Williams (2000)	2.5°C by 2100	Cumulative market impact costs do not exceed 0.1% of GDP in 2100.	The market impact costs will vary from country to country across the globe. High-latitude countries are expected to gain and low latitude countries are forecast to be harmed by warming. However, temperature effects beyond 2°C are expected to reduce benefits and increase damages.
Stern (2006)	Baseline scenario of between 2.4°C and 5.8°C by 2100	An average loss of 5% of global GDP per annum over the next two centuries.	Estimates are based on no action. Costs increase to 20% of GDP or more if a wider range of risks and impacts are considered. Based on simple extrapolations, costs of extreme weather alone could reach 0.5 – 1% of world GDP per annum by the middle of the century.
Intergovernmental Panel on Climate Change, Fifth Assessment (2014)	Approximately 2.0°C	A loss of 0.2% – 2.0% of GDP per annum	There are large differences between countries when damage estimates accelerate beyond 3°C of warming. Delaying mitigation efforts beyond those currently in place to 2030 is estimated to substantially increase the difficulty of transitioning to low long-term emission levels.

# Macro-Economic Impacts



"big picture" focus: Designed to:

- Explore the **cost-effectiveness** of **global mitigation**
- Rather than to **evaluate** the cost of **local adaptation**.





# Macro-Economic Impacts



"big picture" focus: Designed to:

- Explore the **cost-effectiveness** of **global mitigation**
- Rather than to **evaluate** the cost of **local adaptation.**

1. Poorly evaluate linkages between different sectors, especially in water-related activities;
2. Undervalue "non market impacts" for which a dollar value is harder to assign;
3. Do not account for the long term impact of extreme events.

# Thank You

1. “Structure” of Impacts
2. Challenges to Economic Development
3. Macro-Economic Costs