Water in the balance

Overview of the economic impact assessment methods

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Workshop on Economic Implications of Climate Change and Water Scarcity in the Mashreq Region

WORLD BANK GROUP

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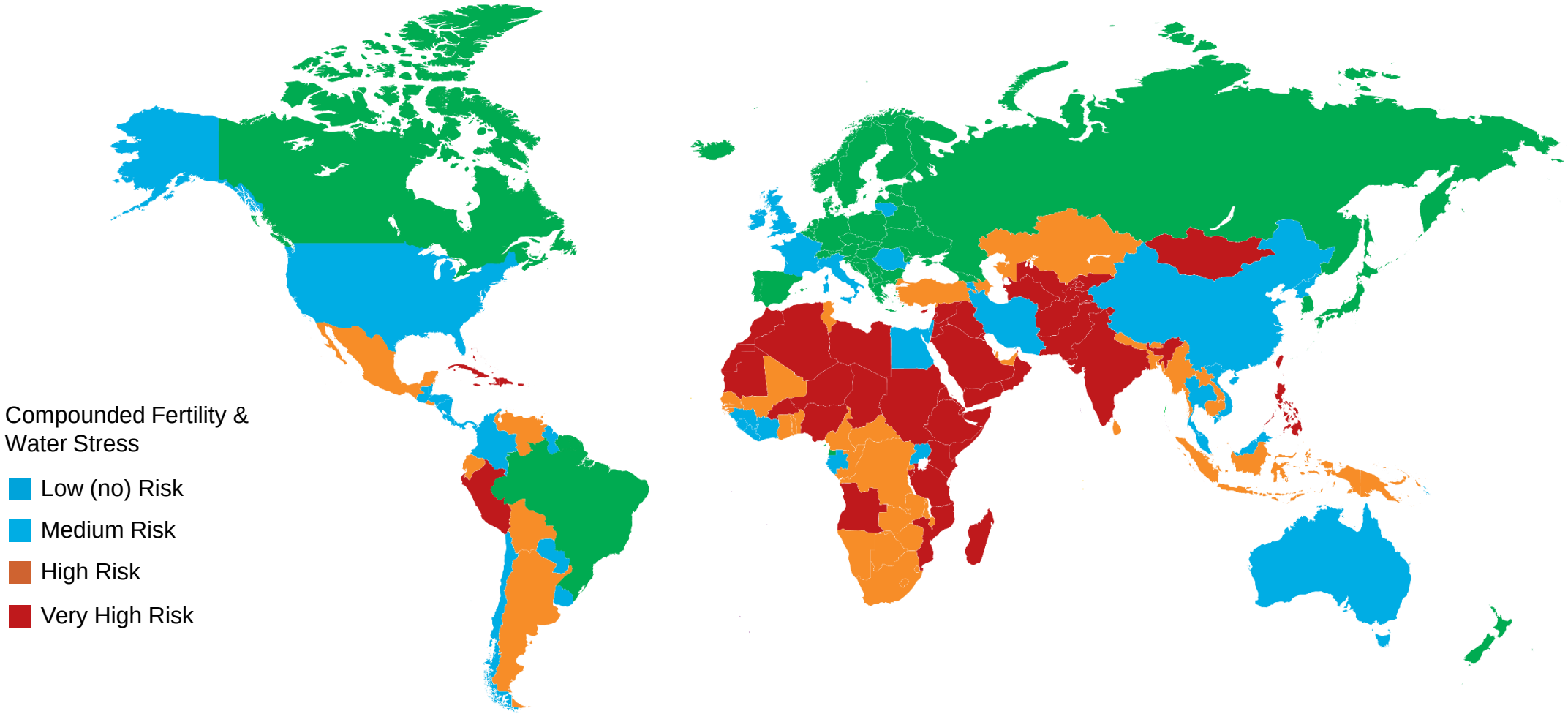
GLOBAL WATER SECURITY & SANITATION PARTNERSHIP

The present outlook: an increasingly thirsty planet

Rising populations and water stress set up a global challenge

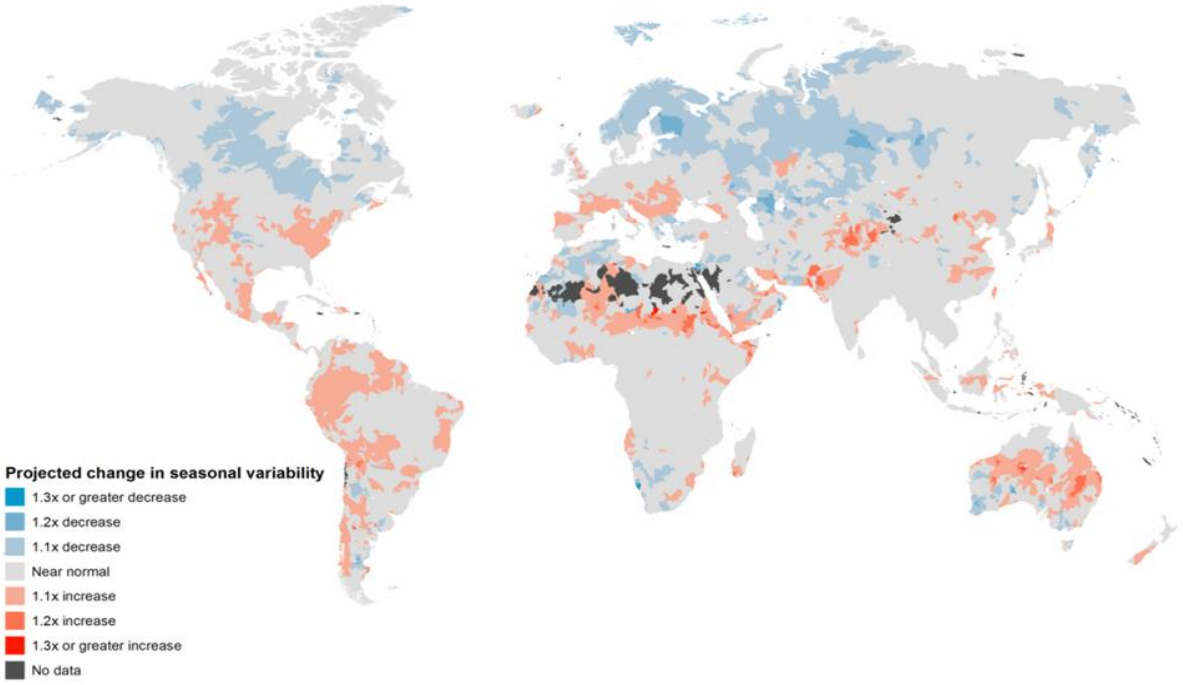
Per capita Water Availability and Future Population Growth, 2050



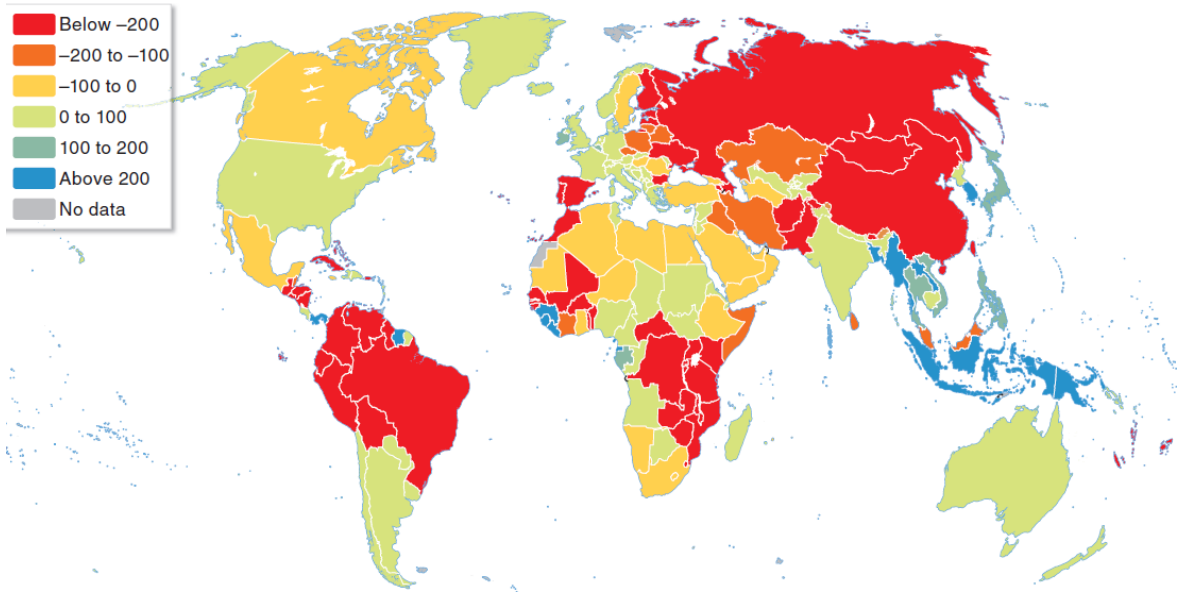
Climate change, an irreversible force

Rainfall variability more challenging than changing temperatures

Change in Seasonal Variability of Precipitation



Change in Runoff



IMPACT OF SCARCITY ON GROWTH

Today's Path

-6% -2% -1% 0% +1% +2% +6%

IMPACT OF SCARCITY ON GROWTH

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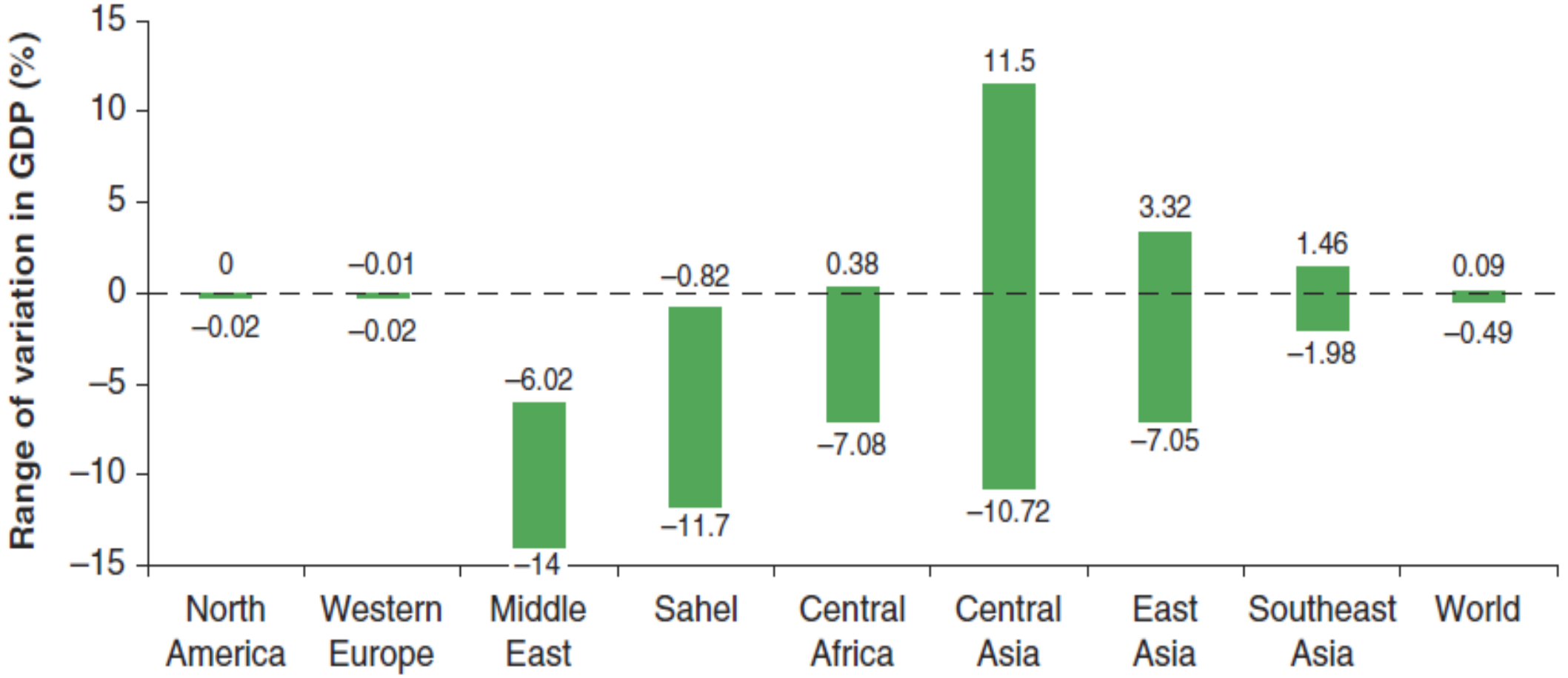


The economist's toolbox: CGE Models

How do such economic models assess such impacts?

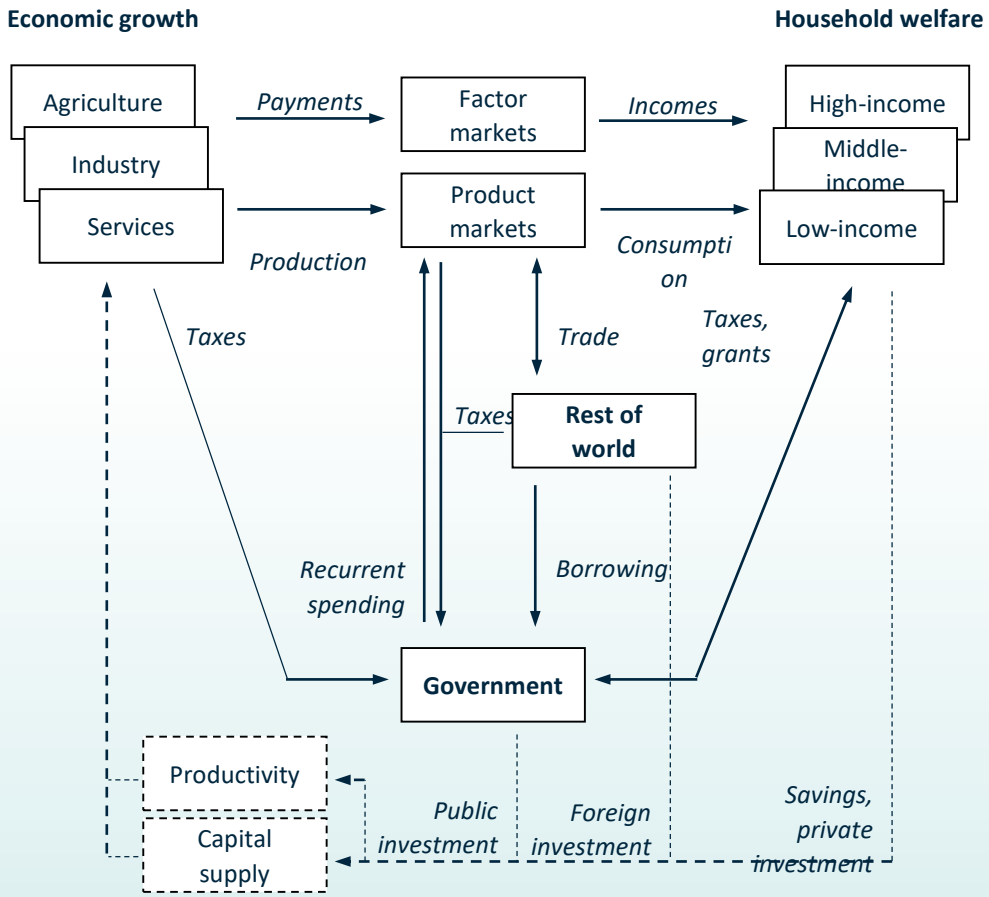
- Computable General Equilibrium (CGE) models look at the **economy-wide impacts of changes in water availability** on production of different goods and services that require water as an input.

Why "computable"?

- Because computers are advanced enough to allow for such models with many equations to be solved numerically.

The economist's toolbox: CGE Models

Computable General Equilibrium (CGE) models :

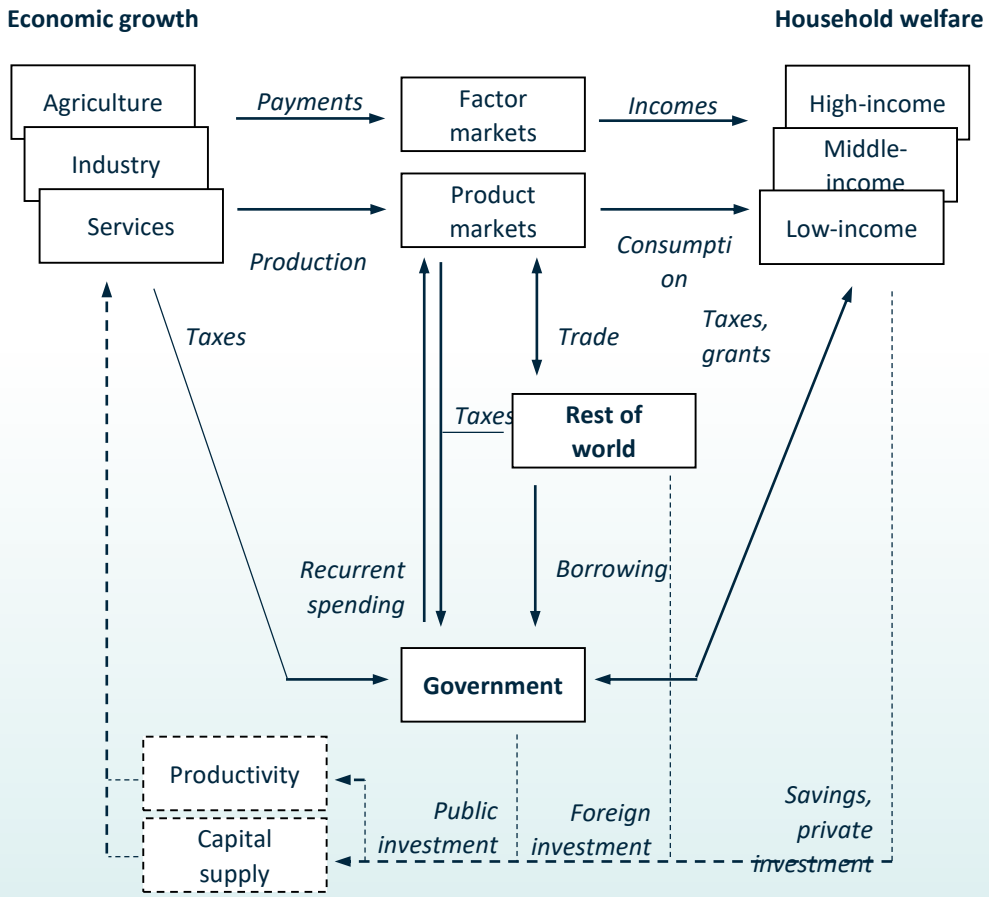


- analyze the impacts of a **decline in the amount of water,** by studying **how such ´shocks´ alter prices, quantities and incomes in the economy**.

- depict entire economies as a **web of interrelated activities and interactions between different economic agents** (e.g. households, producers, the government, etc.), as realistically as possible.

- estimate **how a shock in one sector would reverberate** through the entire economy

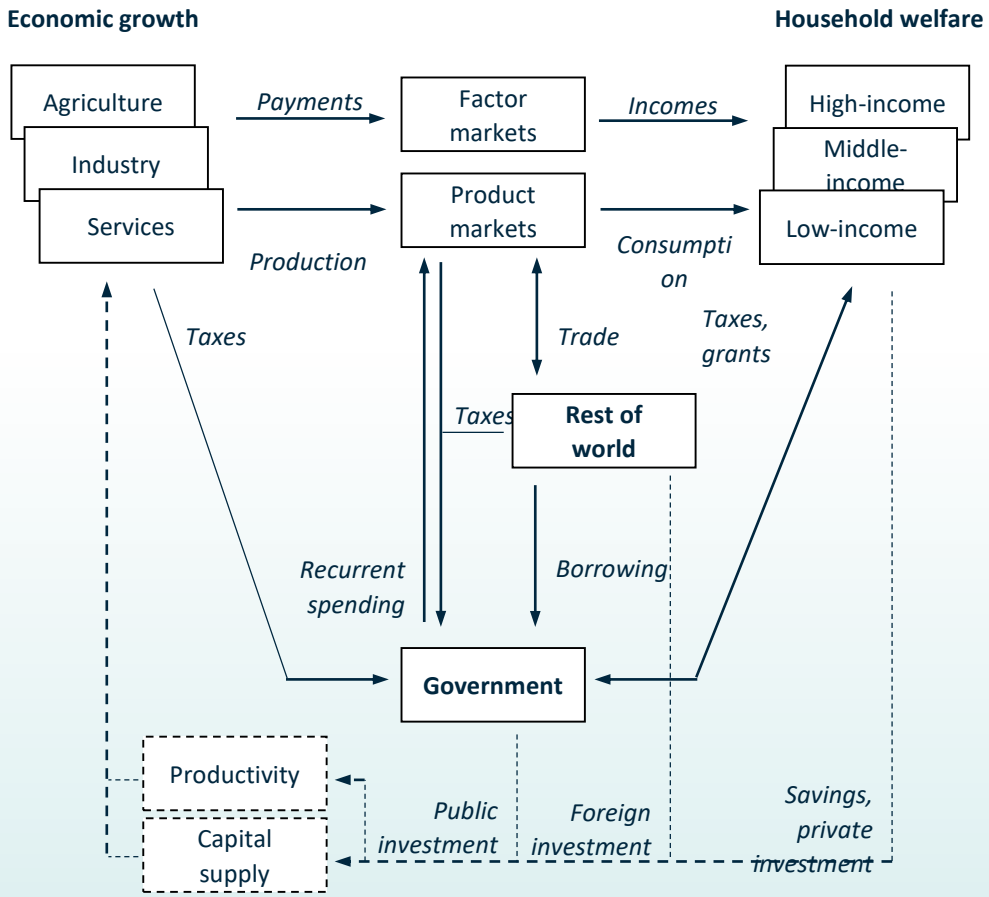
The economist's toolbox: CGE Models



- Since CGE models capture these interlinkages, they are **useful in tracing effects that might cascade through the economy**.

- If for instance, water is rationed in one sector (or region) this could induce a shift in consumption and production away from water intensive activities, leading to changes in economic structure that ripple through the economy. **CGE's are arguably the best available tool to track such impacts.**

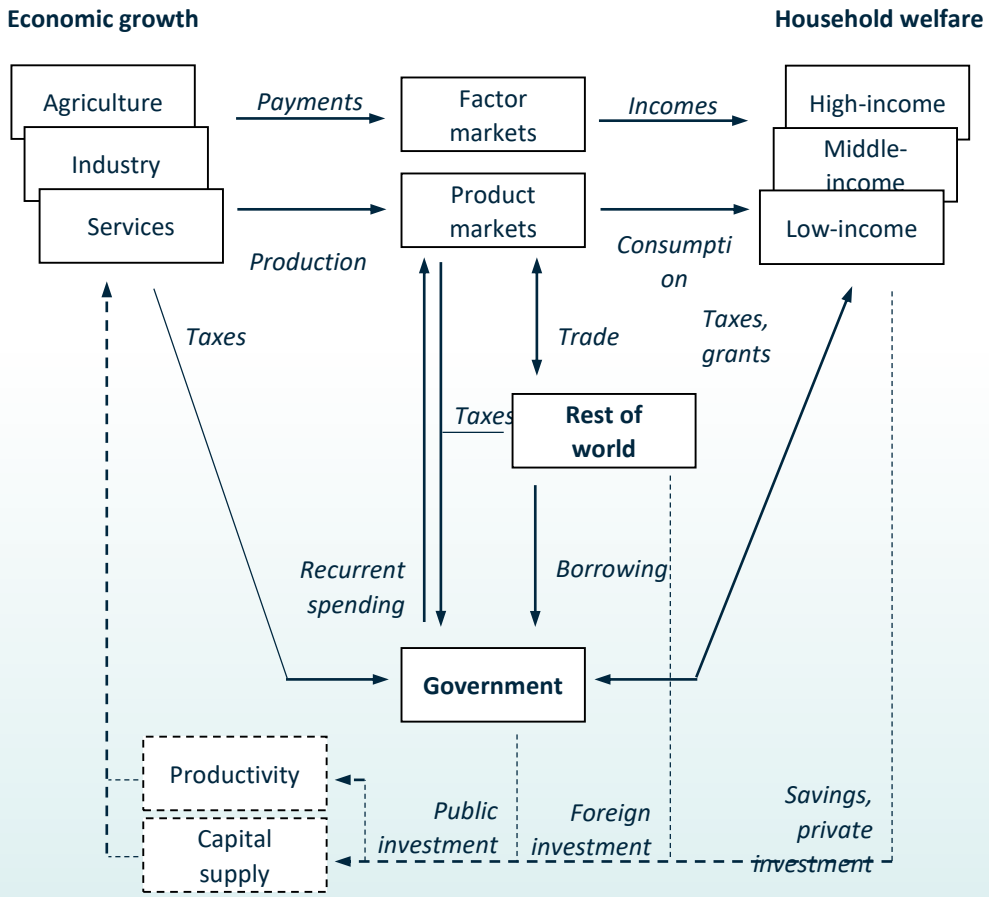
The economist's toolbox: CGE Models



A note of caution:

- **Underlying these models are assumptions** on how changes in sector X impact sectors Y, Z, etc. and even how changes in these sectors will rebound and impact sector X.
- The model developed here is **not intended to provide forecasts of growth decades into the future**.
- Instead it uses counterfactual scenarios to provide **projections *not* predictions or forecasts of what might happen**.

The economist's toolbox: CGE Models



In this way, CGE models can:

- **improve understanding of the role of water** in the context of a changing climate.
- **isolate the role of water** as a productive input in the economy
- turn projections of water scarcity into **meaningful metrics for policy-making**

Current report uses the **GTAP-BIO-Water** model →most advanced global CGE-Water model available around the world.

→ First regional analysis of the economic impacts of water scarcity on Mashreq economies

The economist's toolbox
In summary

Novel dataset

Database to represent biophysical and economic data to capture interlinkages among economic activities and **biophysical conditions** (land, water climate change).

Disaggregate information on economic performance

Novel approach

What does **water scarcity** mean for economies, employment and food security?

What if analysis

Snapshot of the impacts of scarcity, not forecast of the future

Download the report

https://bit.ly/399p3vE

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