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# **Towards an integrated approach to dam impact assessment in the Eastern Nile**

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# 1- Introduction

Length

- Around 6,700 km long

Area

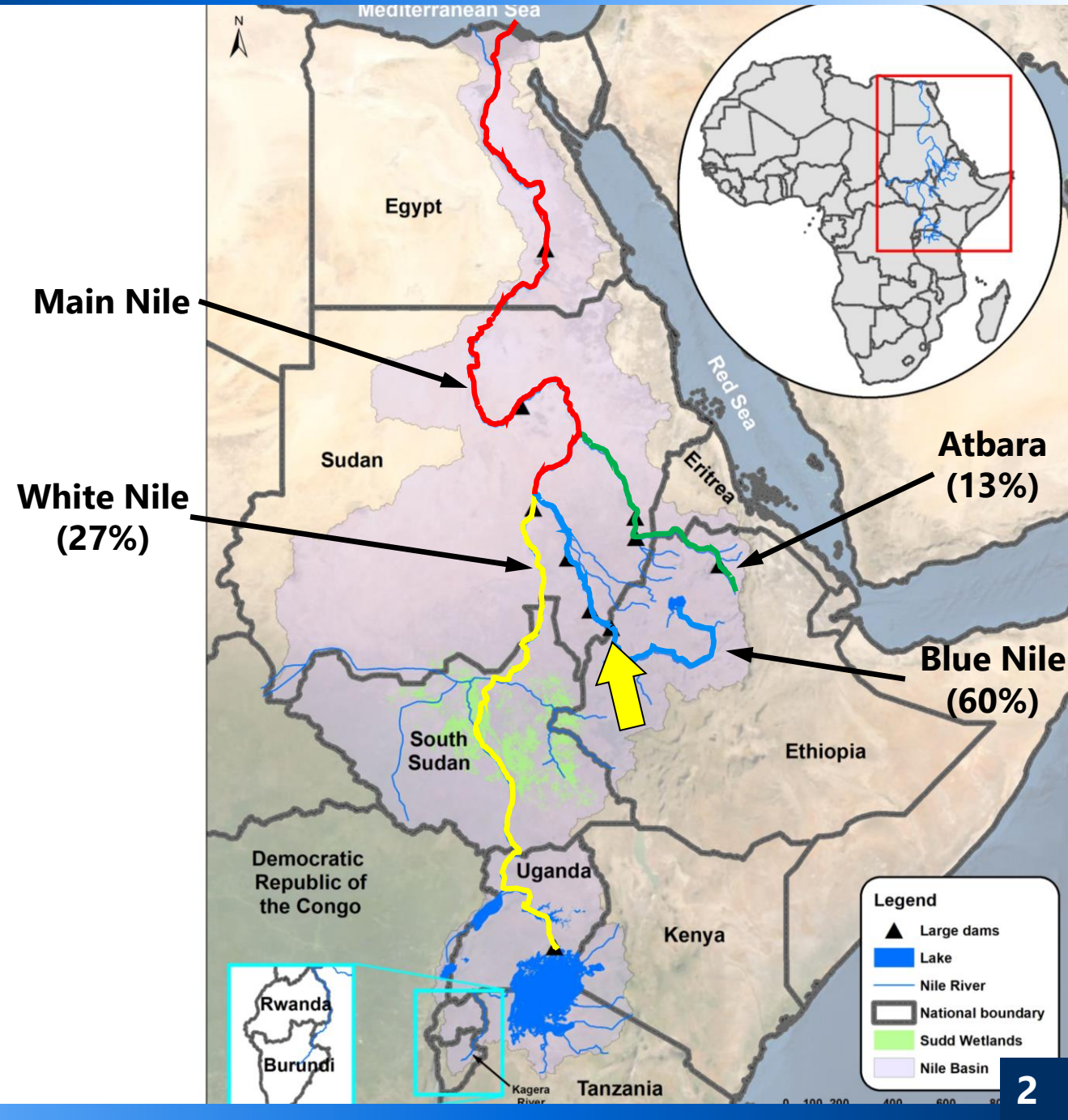
- Covers around 10% of Africa

Countries

- 11 riparian countries

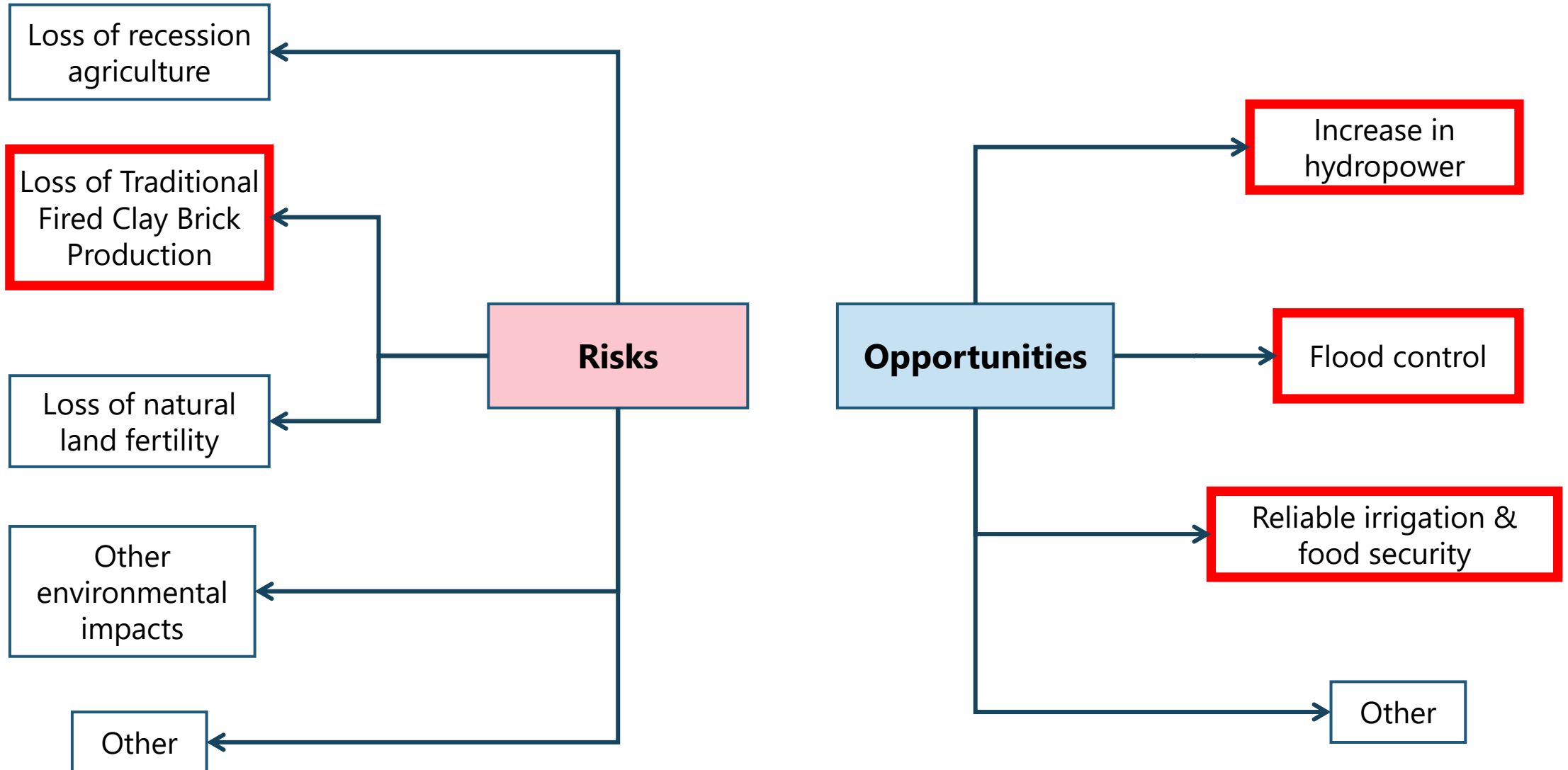
Population

- 505 million

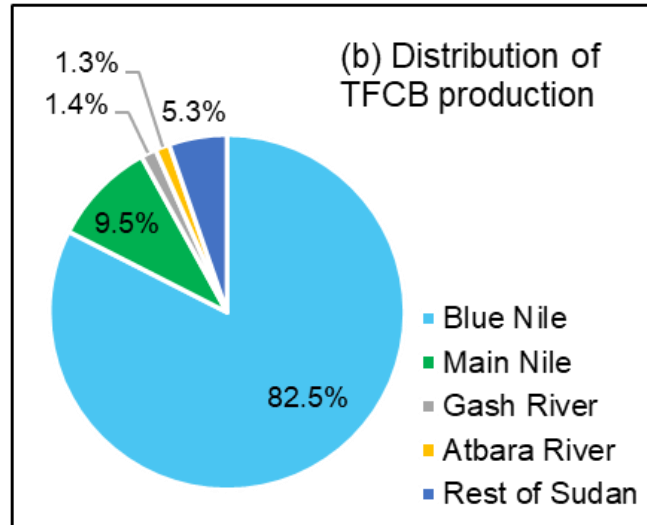


## 2- Methodology

### GERD impacts on Sudan



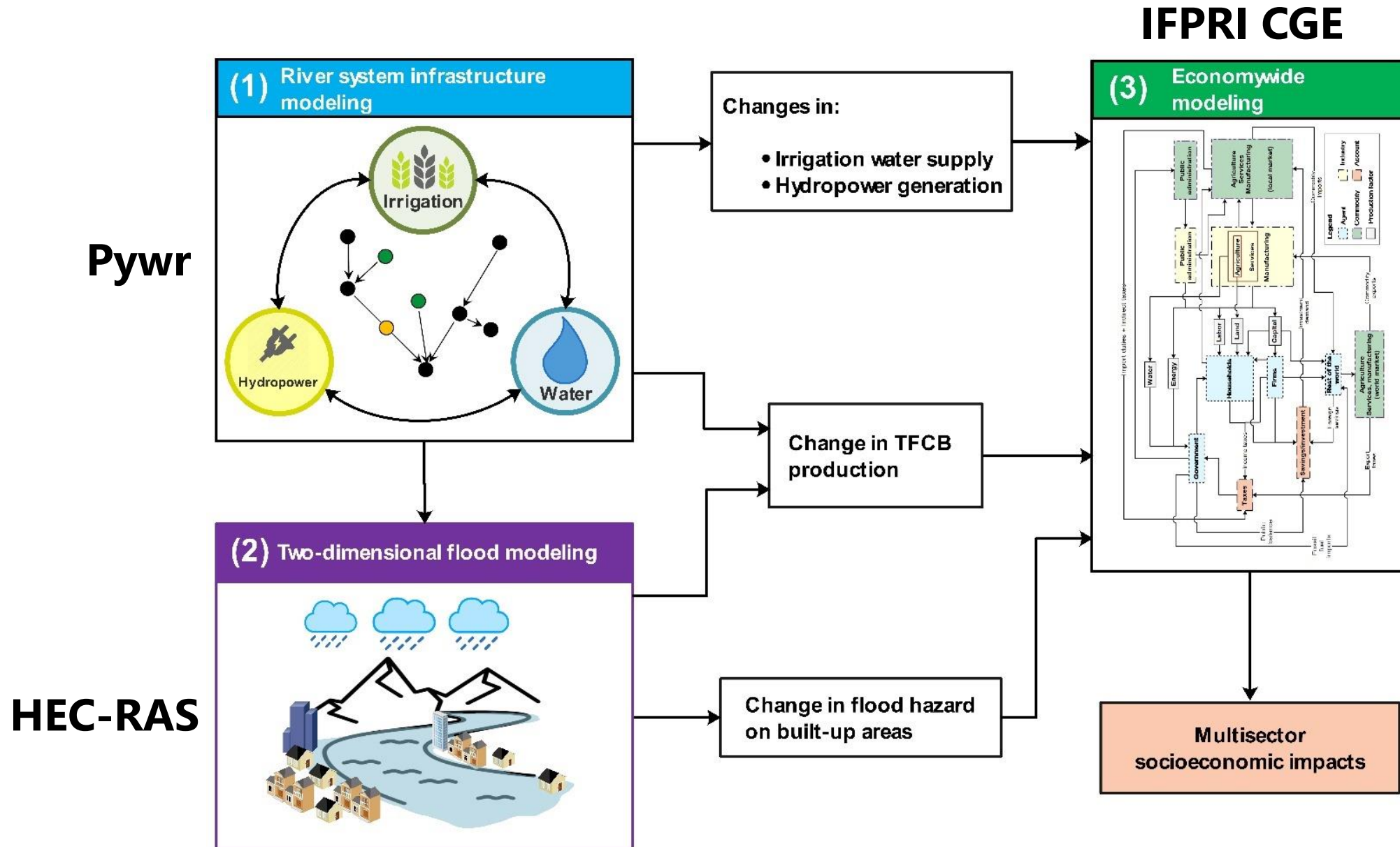
## 2- Methodology



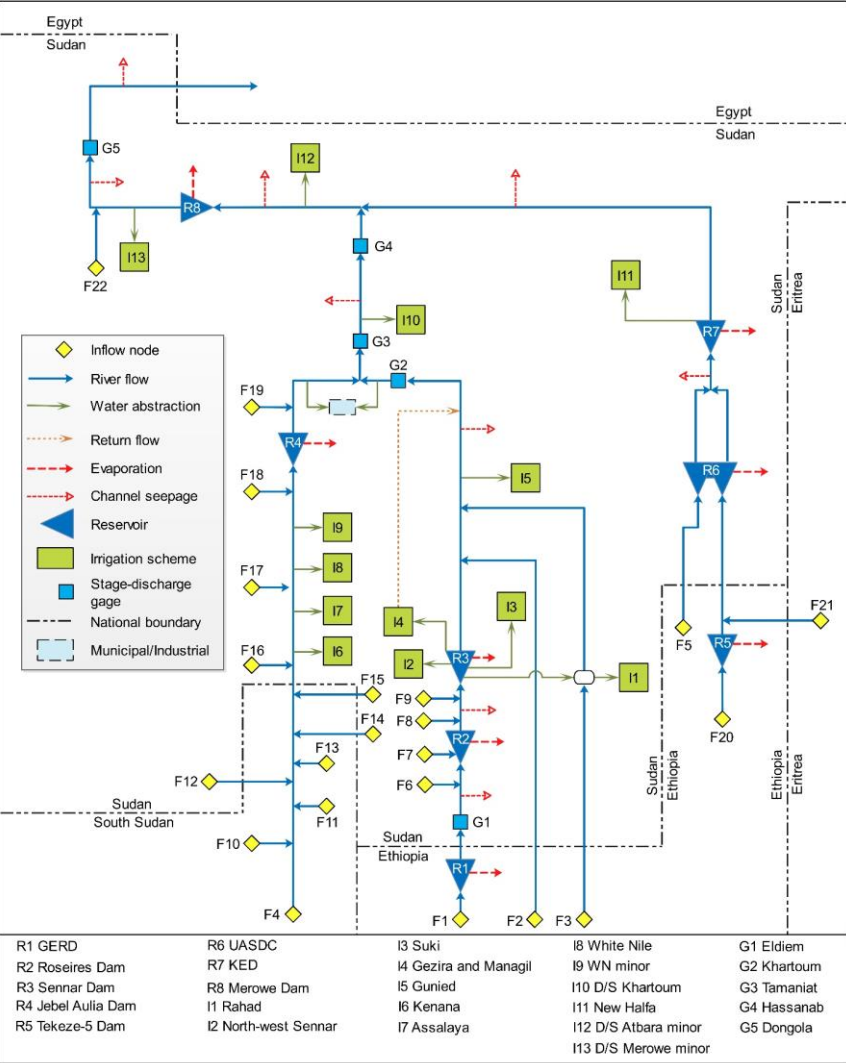
Alam, S. A. Use of biomass fuels in the brick-making industries of Sudan : Implications for deforestation and greenhouse gas emission. (University of Helsinki, 2006).



## 2- Methodology

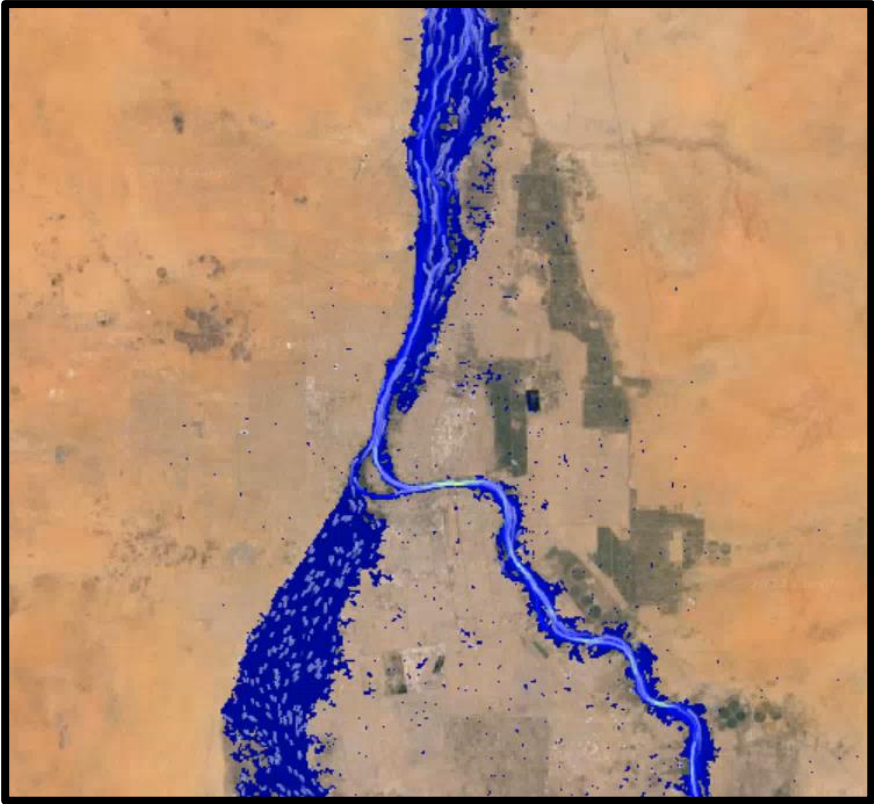


# 3- Model development

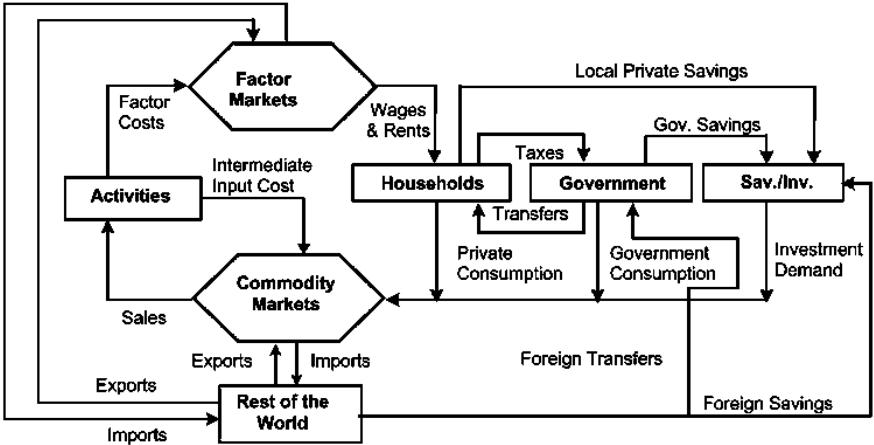


Eastern Nile River system model

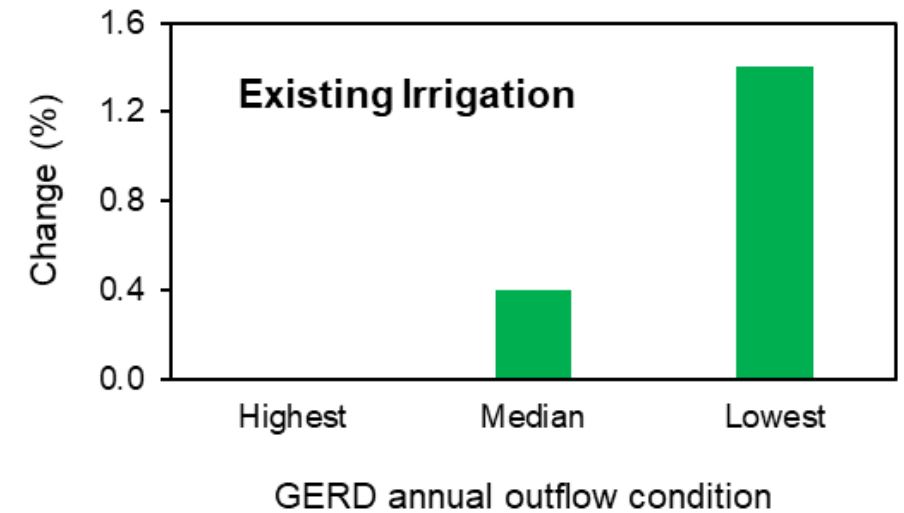
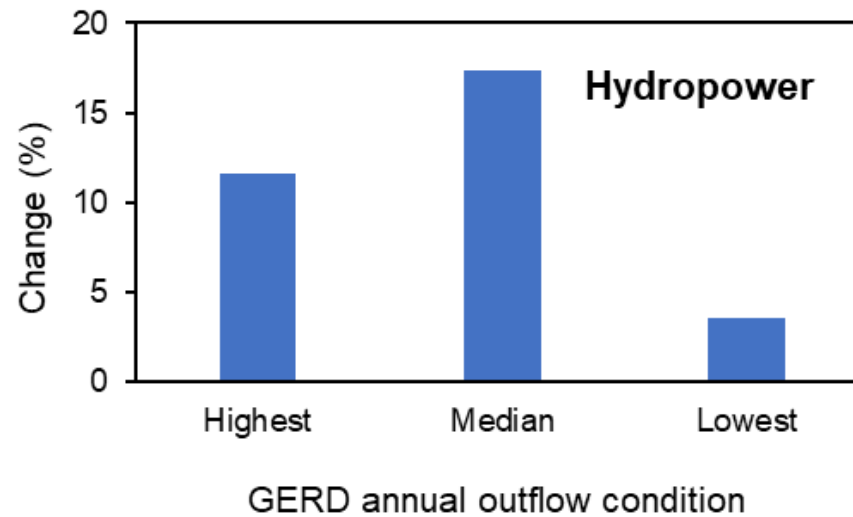
Sudan flood model



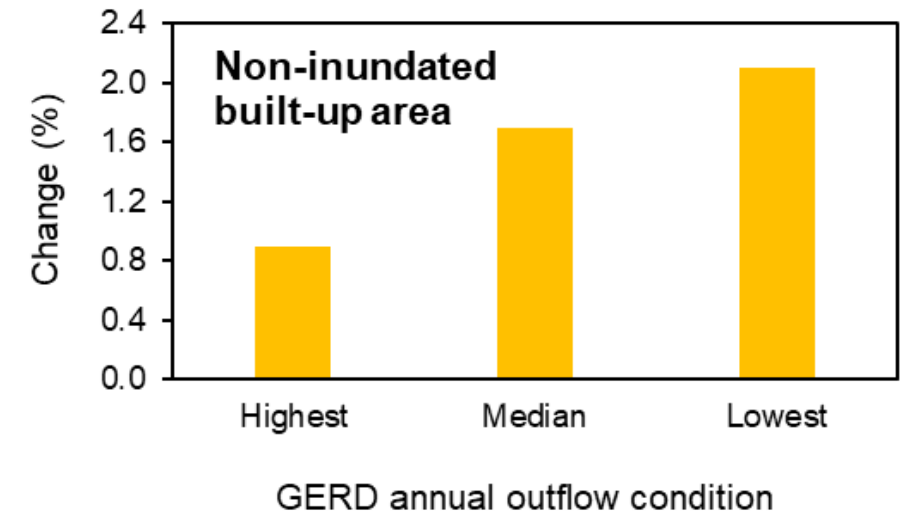
Sample aggregate CGE model



### 3- Results



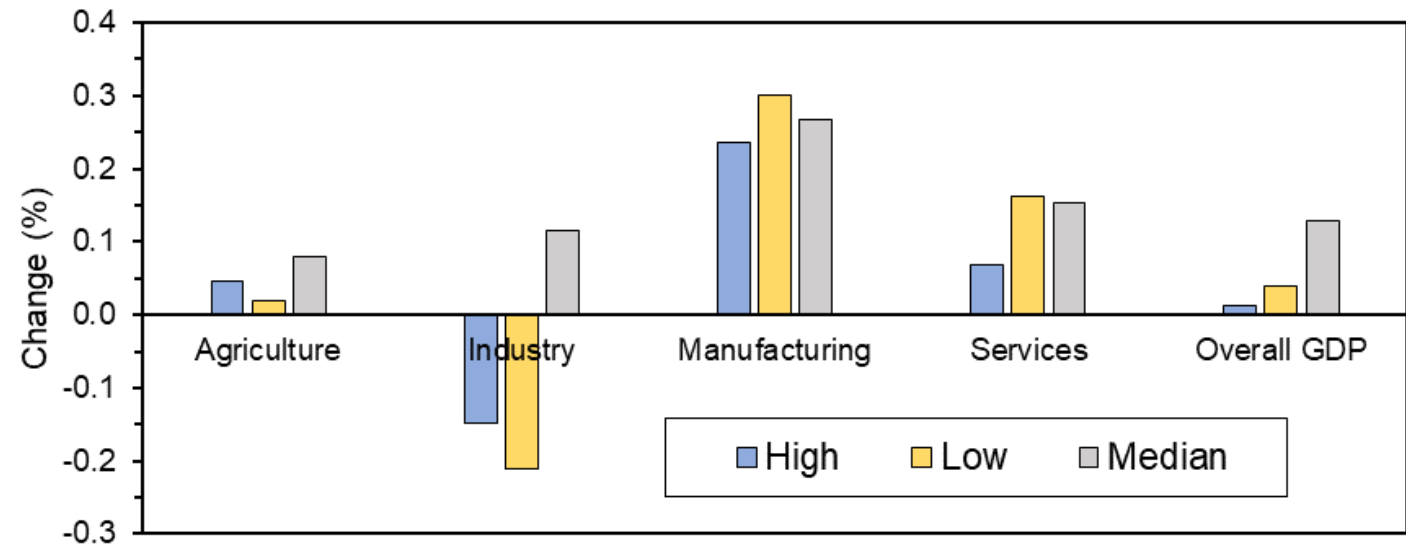
- ❑ Positive impact on hydropower generation, irrigation, and flood damage.
- ❑ Negative impact on brickmaking, by eliminating production along the Blue and Main Nile.



## 4- Results

Aggregate impact on GDP in 2025:

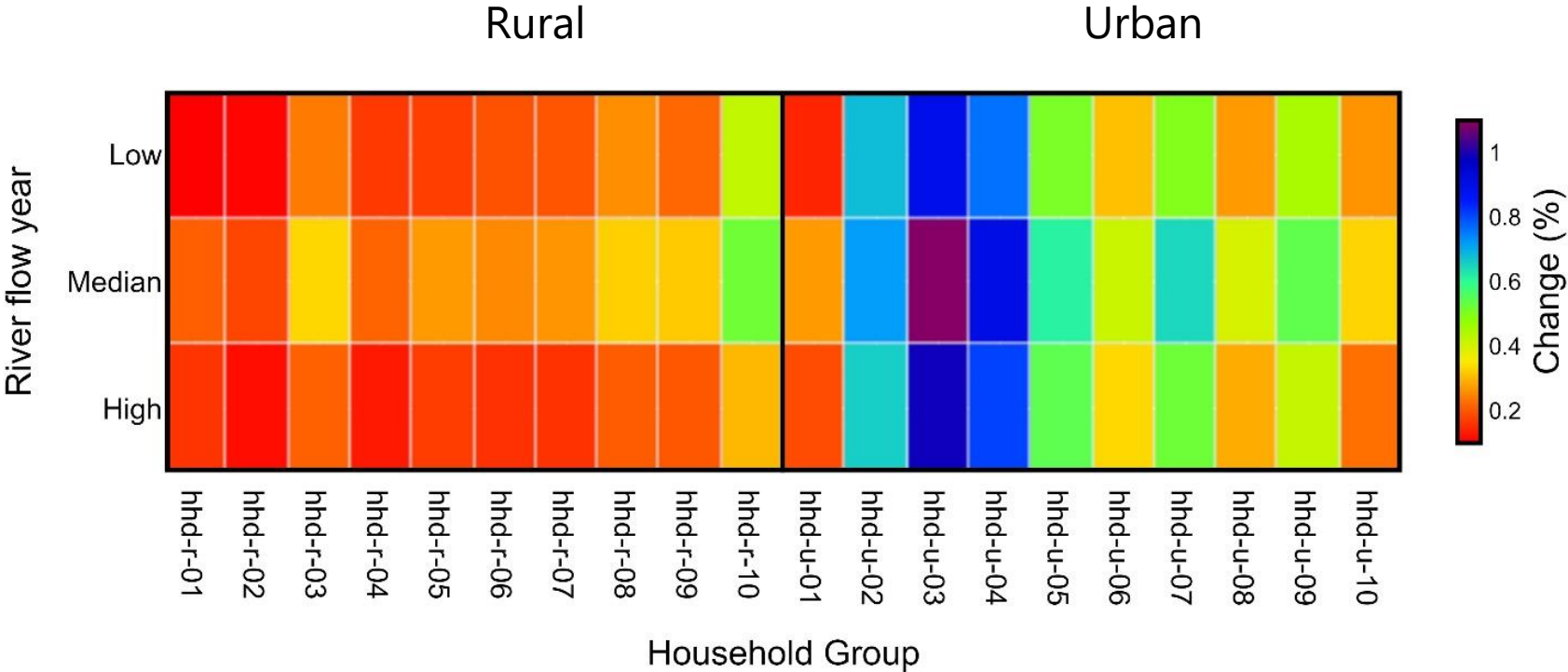
- ❑ Agriculture, manufacturing and service sector related GDP would grow
- ❑ Industrial GDP would shrink under high and low hydrologic conditions
- ❑ Overall GDP with GERD would grow up to 0.1%, ceteris paribus



# 4- Results

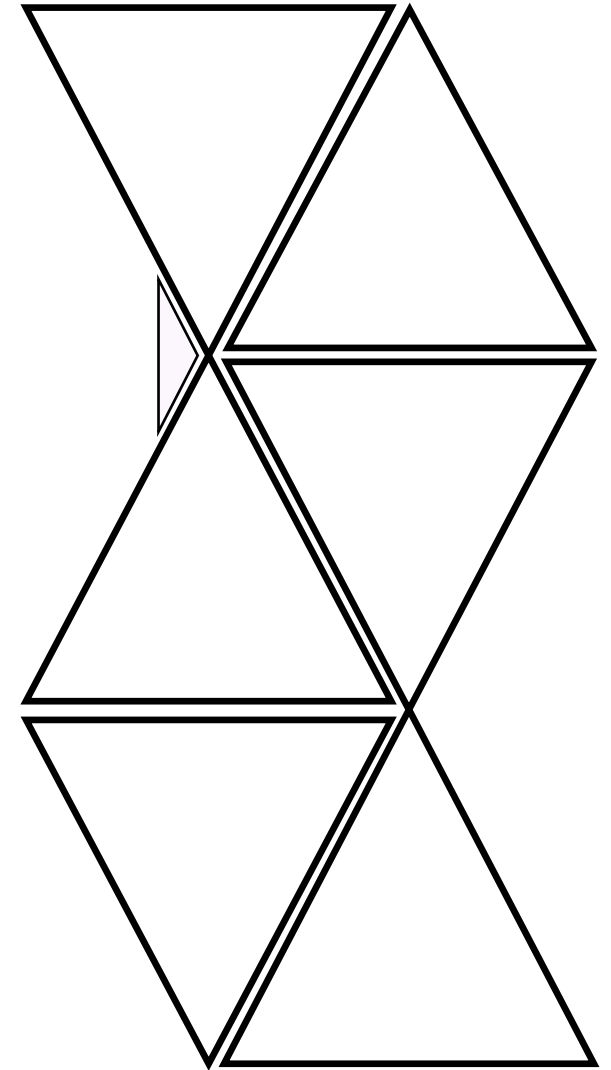
Distributional impacts on household welfare in 2025:

- ❑ All household groups experience positive welfare impacts
- ❑ Welfare improvements are larger for urban than rural household groups



## 5- Conclusions

- ❑ Need to develop broad frameworks of potential impacts from large dam infrastructure
- ❑ Need to identify policies, institutions and technologies that reduce negative impacts for some populations
- ❑ There are additional impacts not yet considered in this analysis
- ❑ Models inherently contain uncertainties



# Thank you for your attention!

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### 3- Simulation scenarios

- ❑ Three hydrologic conditions:
  - High flow
  - Median flow
  - Low flow
- ❑ Two dam scenarios:
  - With GERD
  - No Gerd
- ❑ Simulating the economy in 2025

