

# Assessment of Climate Change Impact on Baro Hydropower Projects

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# Presentation Outline

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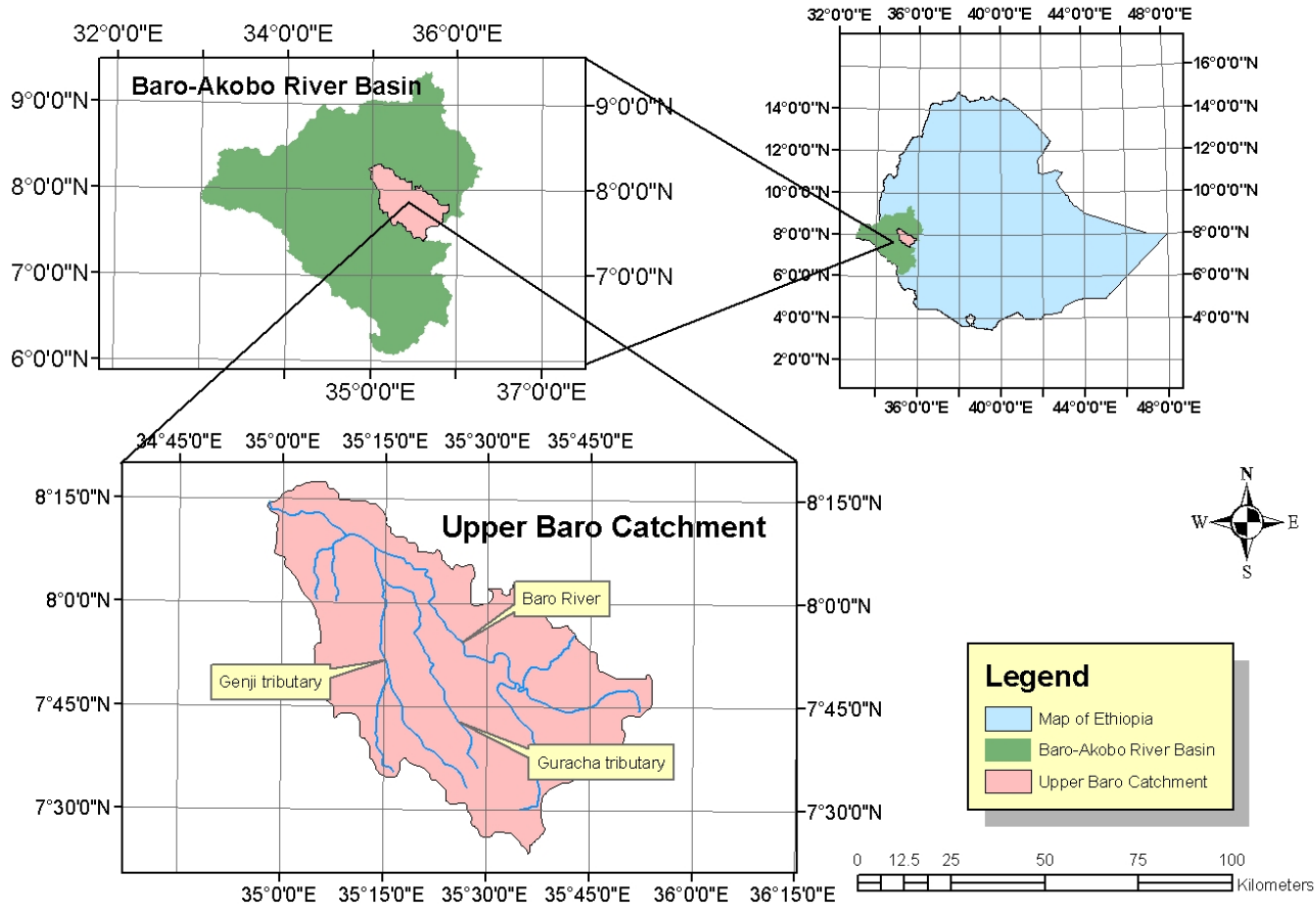
- Key Messages
- Study Area
- Study objectives
- Materials and Methods
- Climate Scenarios
- Flow Scenarios
- Climate Impacts
- Conclusions

# Key Messages

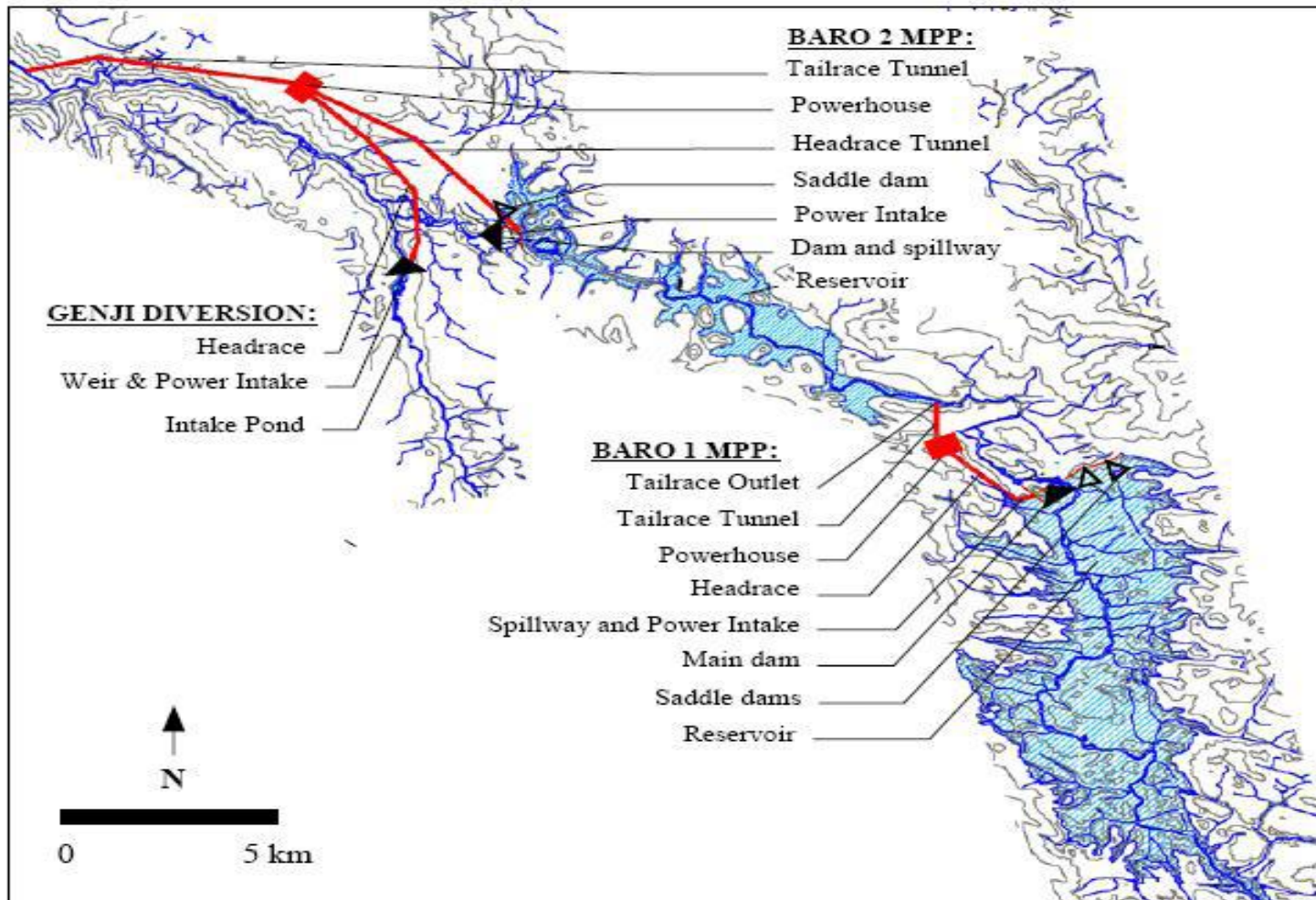
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- Climate change could affect performance of water infrastructures either negatively or positively
- The environmental and social impact assessment of water developments should include climate impacts
- Climate Impact Assessment (CIA) should be mandatory for any water resources development planning and design
- The CC adaptation measures proposed by CIA and EIA should be implemented and followed up seasonally

# Study Area



# Study Area ...



Source: MoWR (2006)

# Study Objectives

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## General Objective:

- Investigate the regional climate change impacts on Baro multipurpose projects

## Specific Objectives:

- Assess the plausible climate and hydrologic scenarios of the Baro catchments
- Evaluate the impact of climate change on Baro reservoirs inflow volume and power generation capacity

# Materials and Methods

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- Climate downscaling
  - Transfer function using ERA-40 reanalysis
  - Climate prediction using ECHAM5-OM GCM outputs
- Hydrological modeling
  - Transform downscaled climate scenarios into flow scenarios
  - Monthly water balance model
- Integrated water resources modeling
  - WEAP model for reservoirs and power production
- Climate impact analysis

# Climate Scenarios

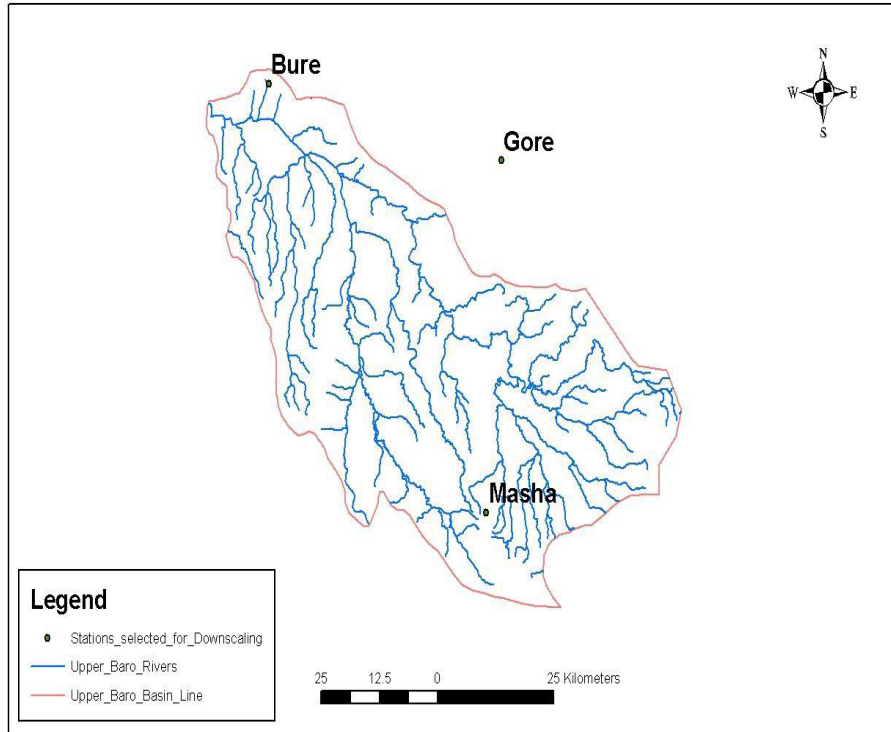
## Predictor Variables

### Precipitation:

- mslpsur
- rhum500
- vwnd850

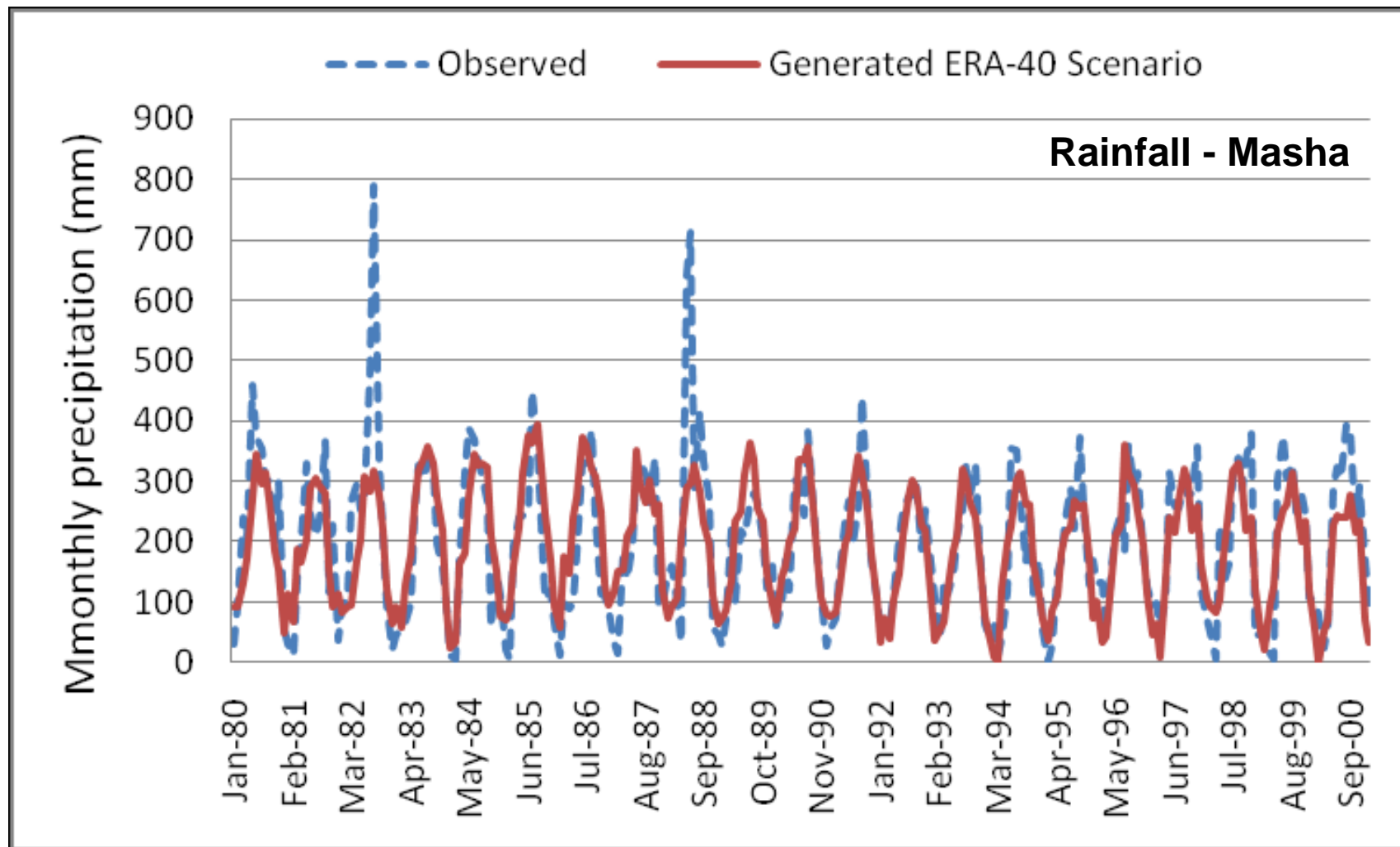
### Evapotranspiration:

- Mslpsur
- Rhum850
- temp02m

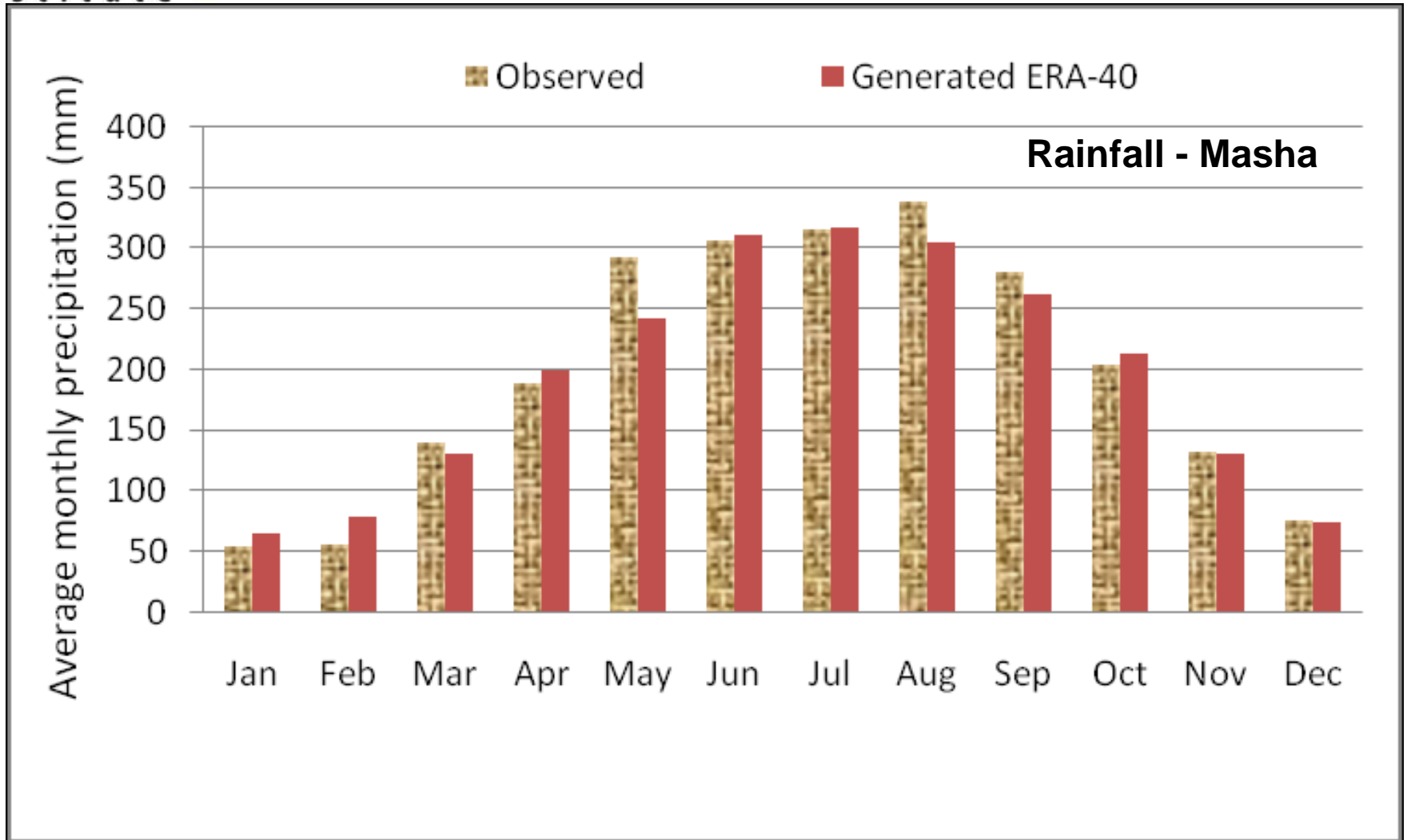




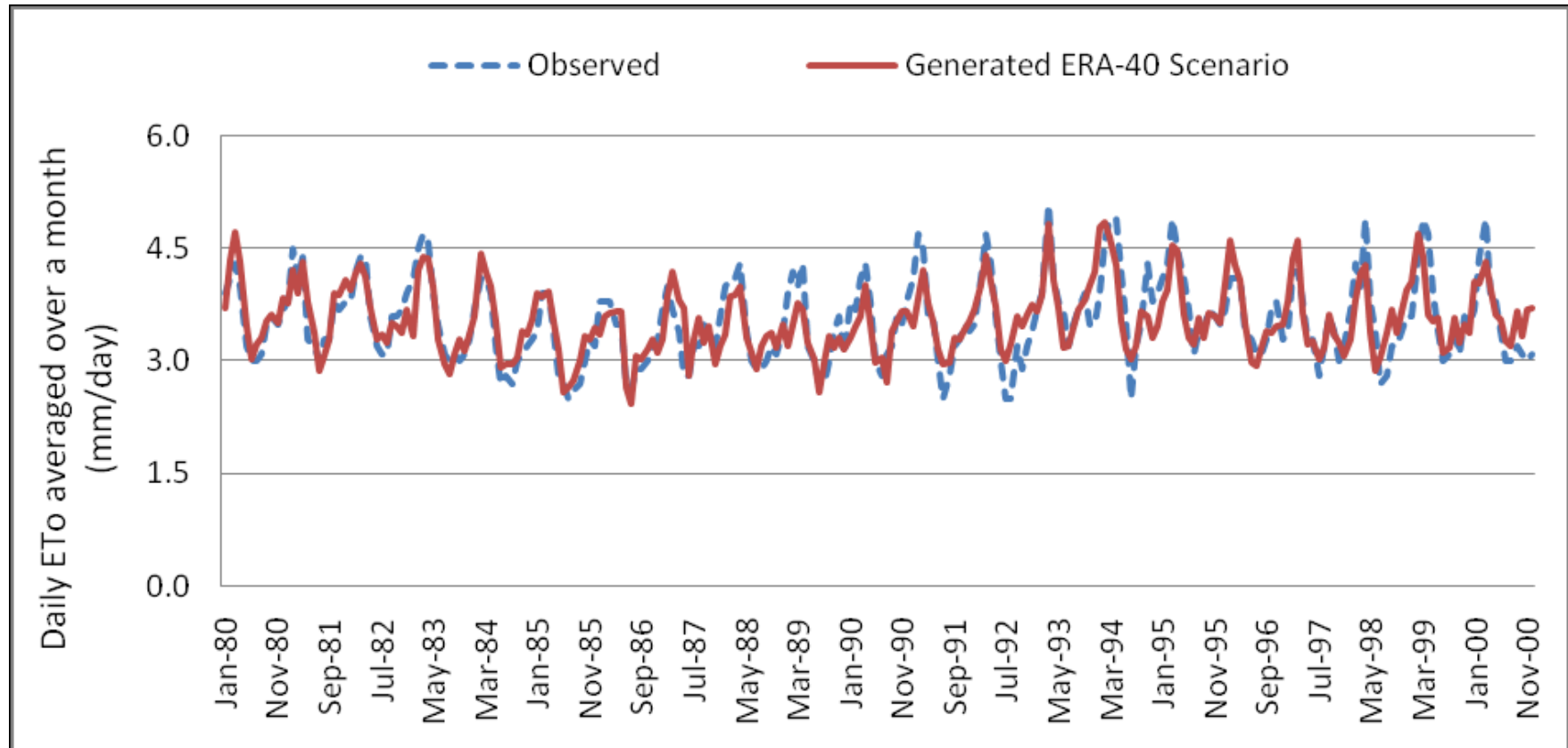
# Climate Scenarios ...



# Climate Scenarios ...

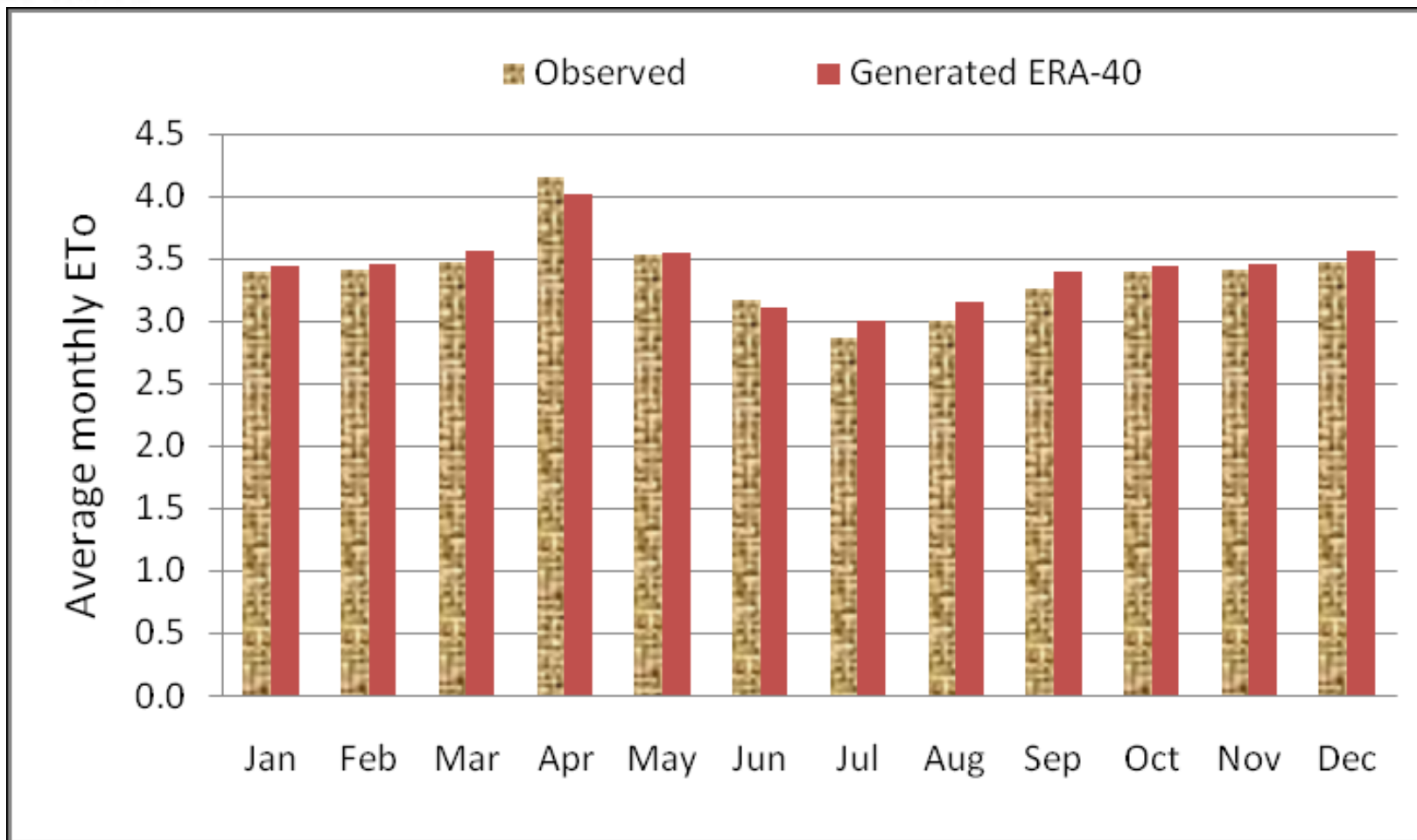


# Climate Scenarios ...



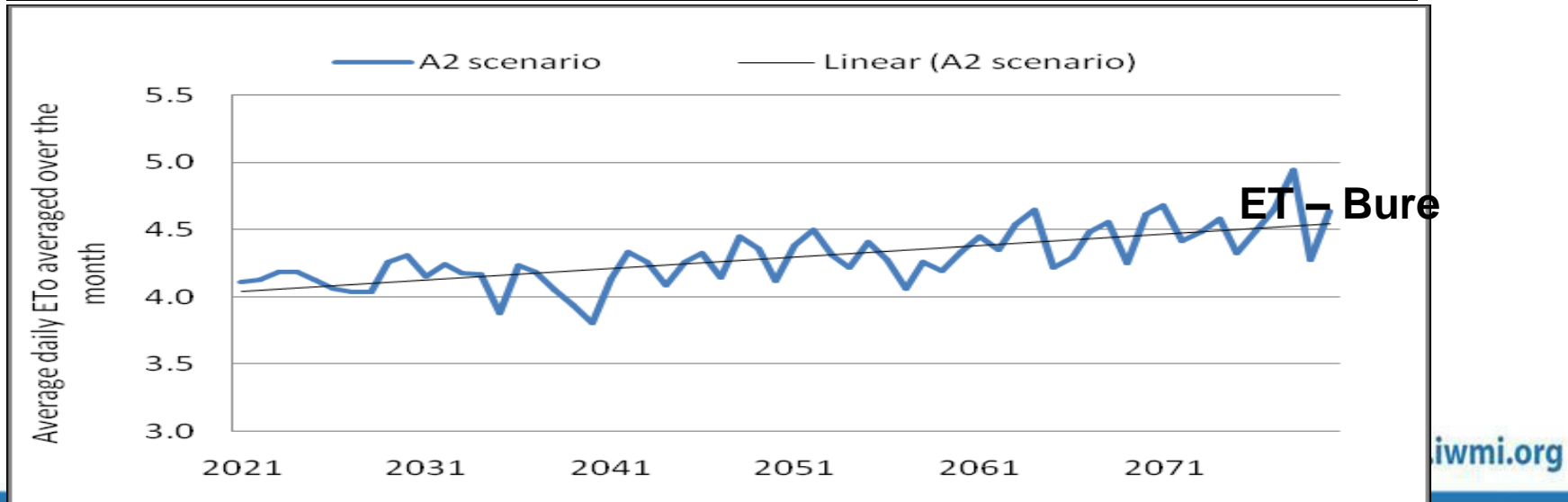
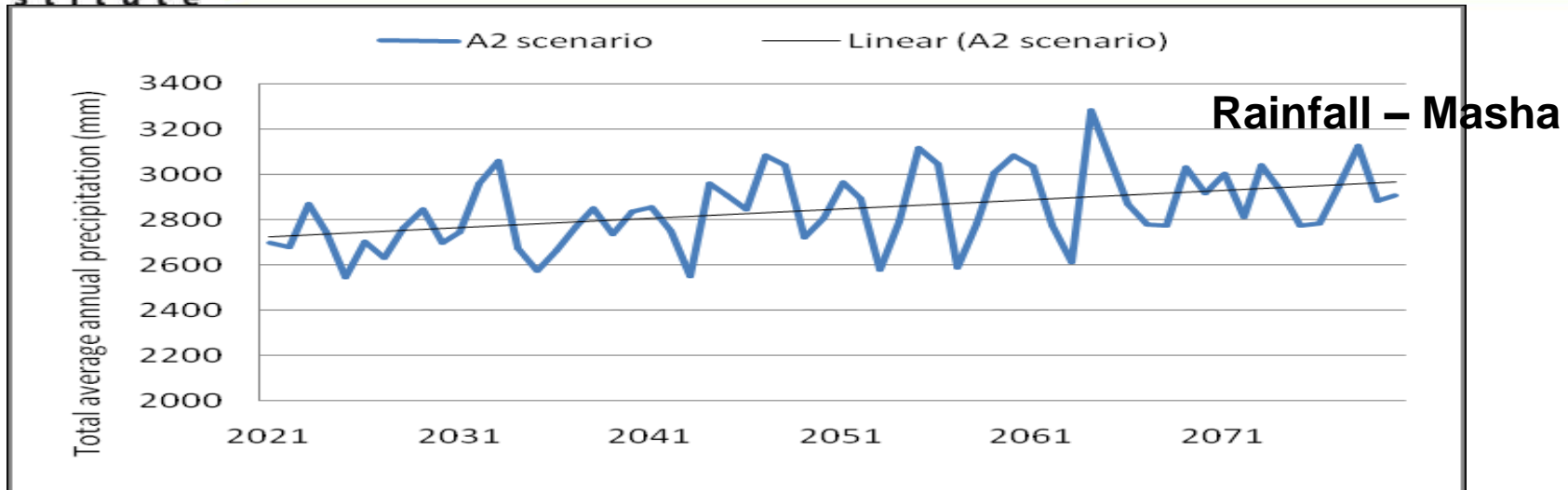
**ET – Bure**

# Climate Scenarios ...

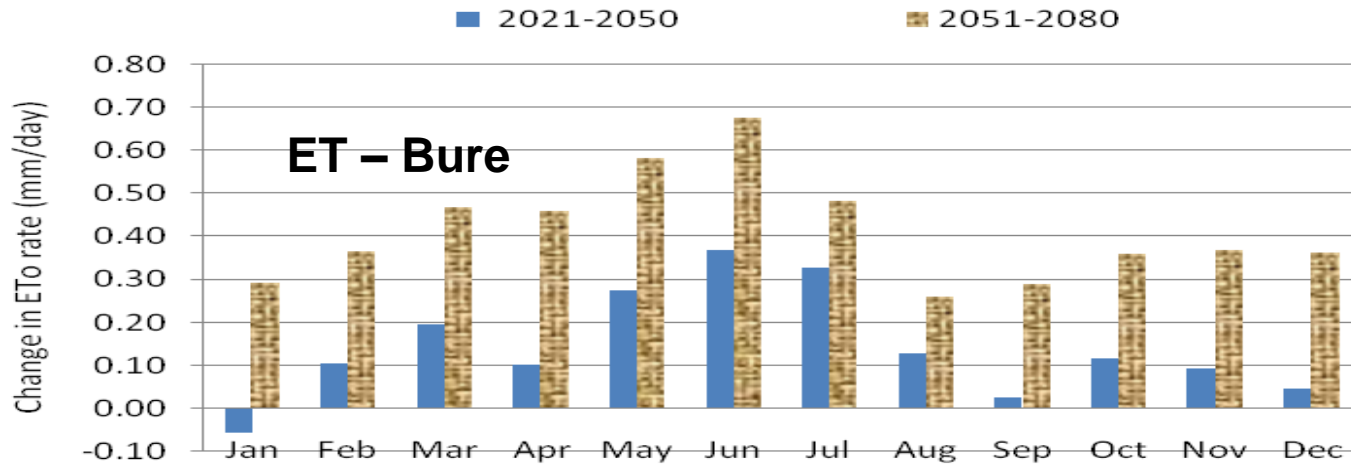
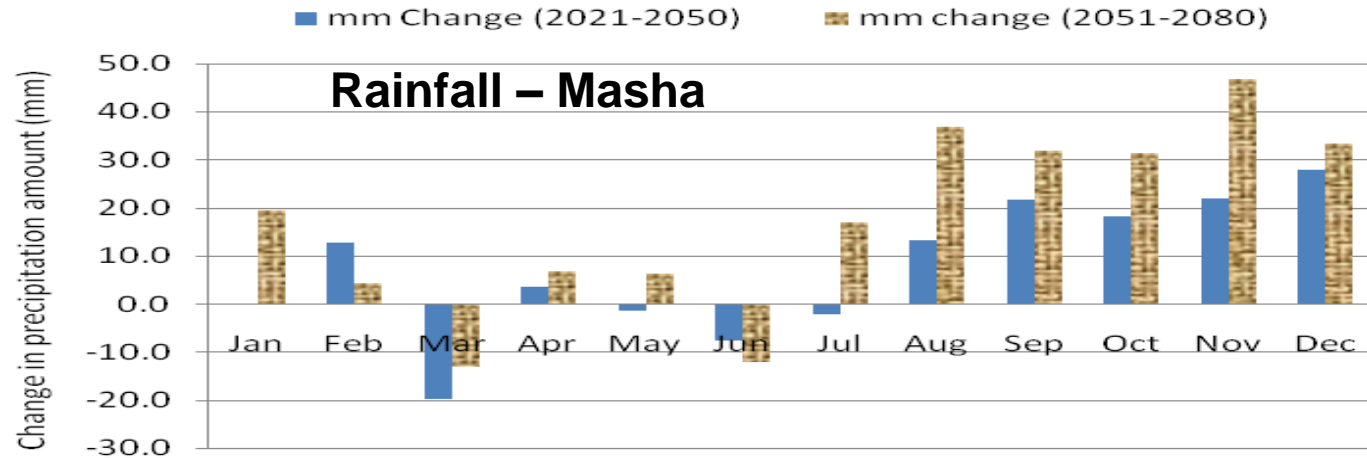


**ET – Bure**

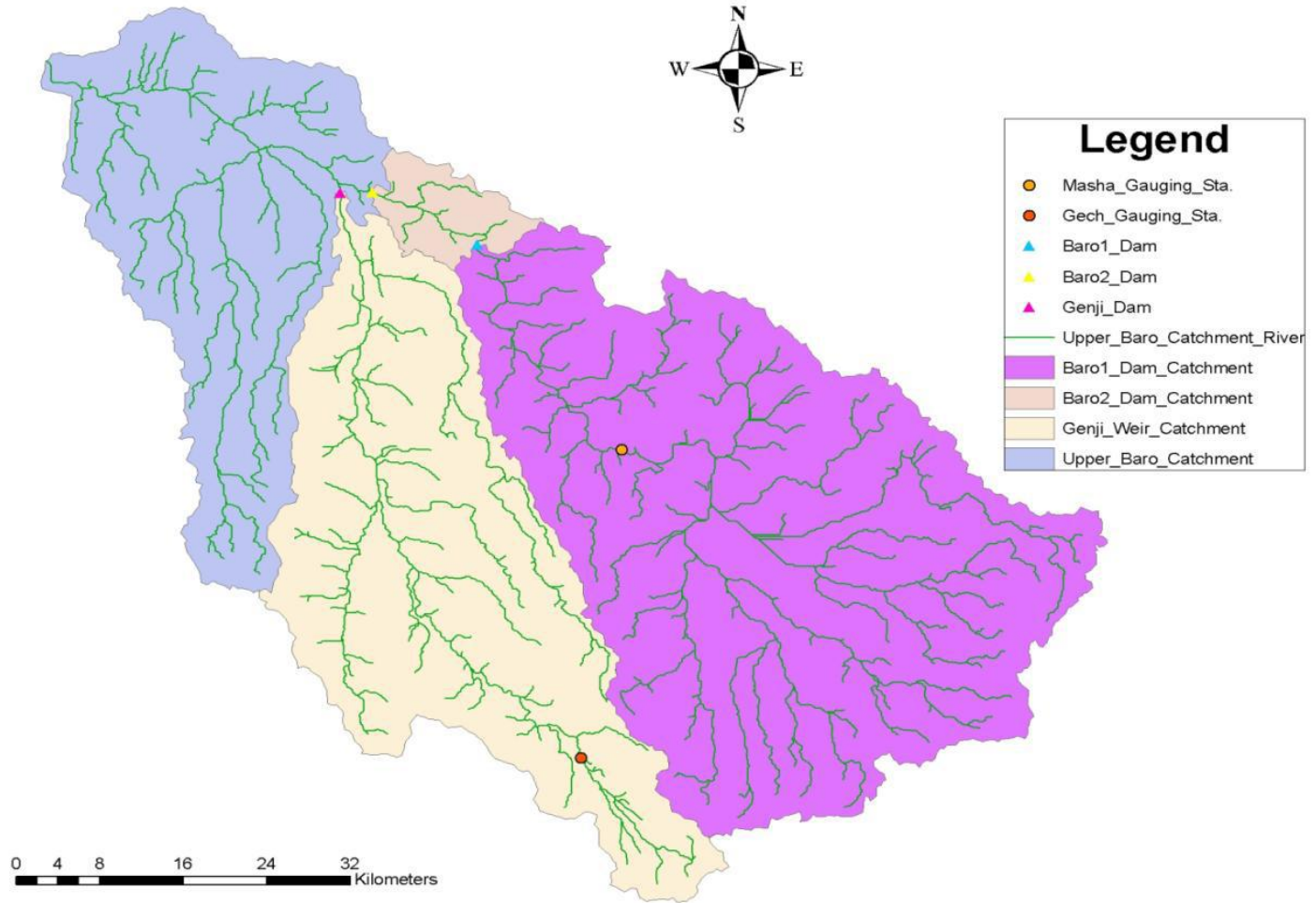
# Climate Scenarios ...



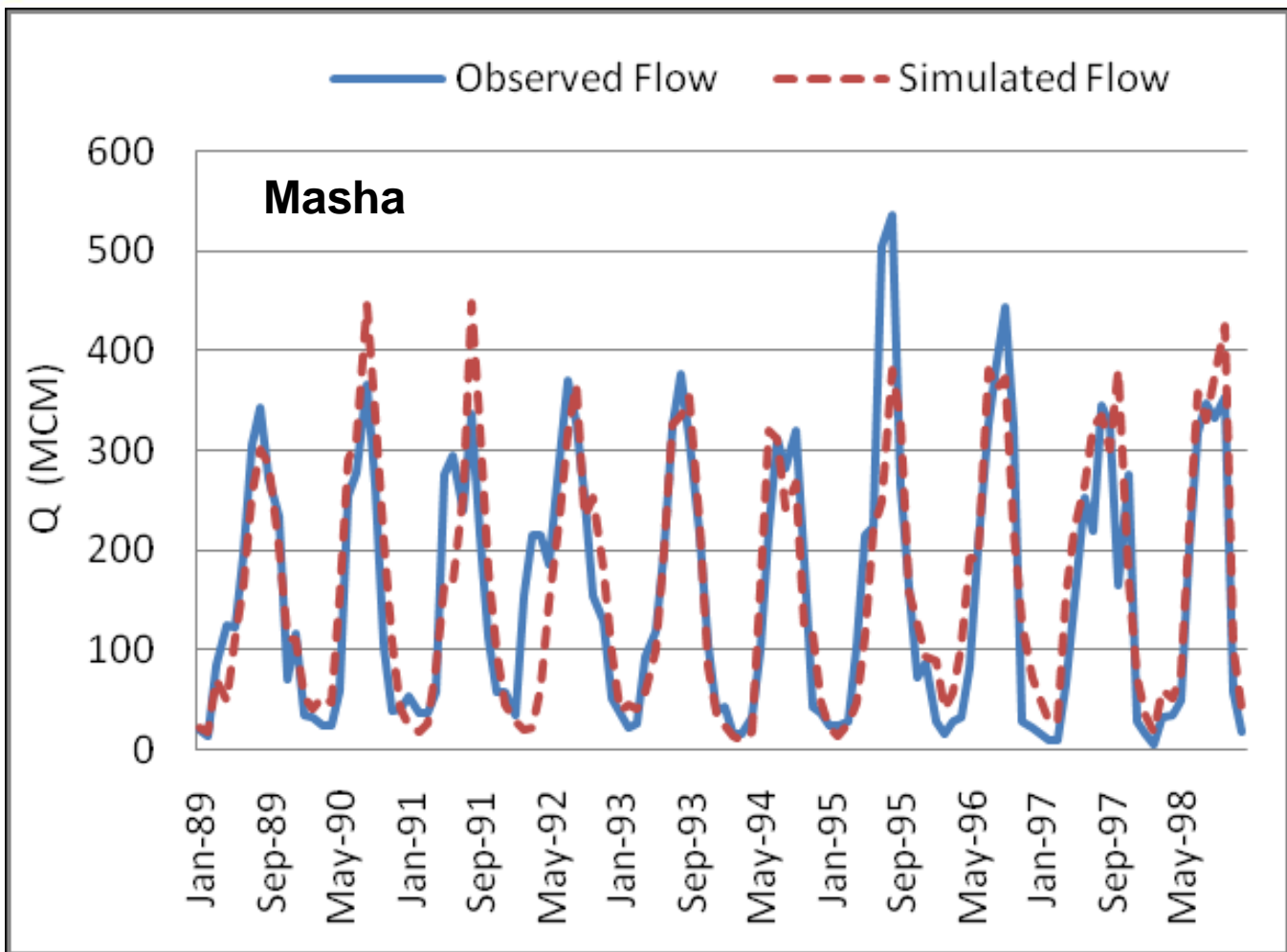
# Climate Scenarios ...



# Flow Scenarios

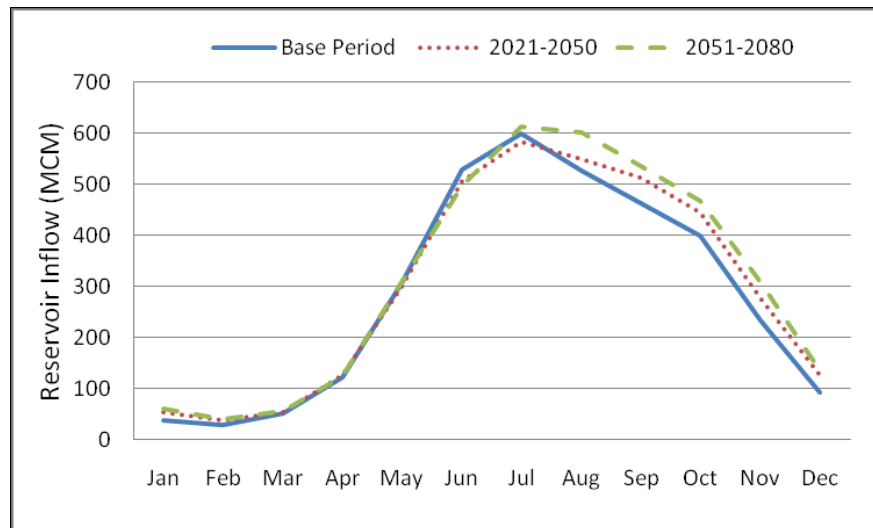
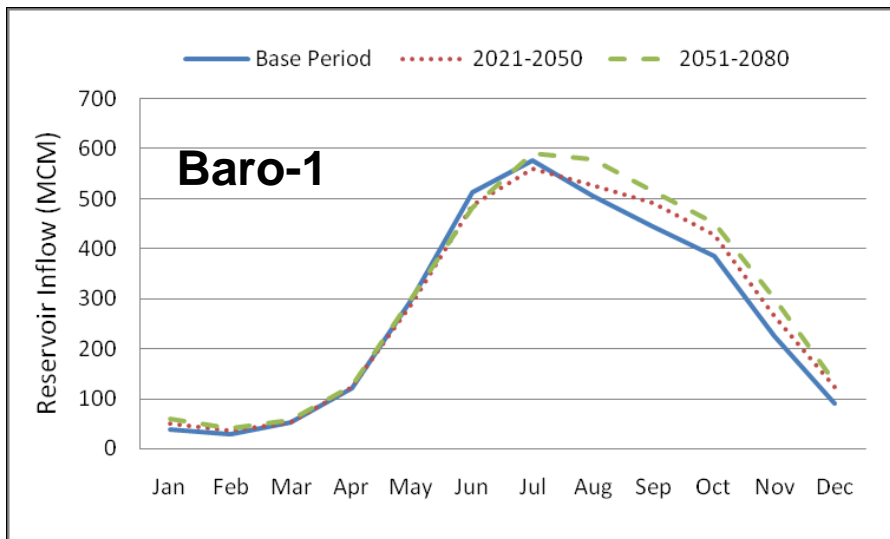


# Flow Scenarios ...



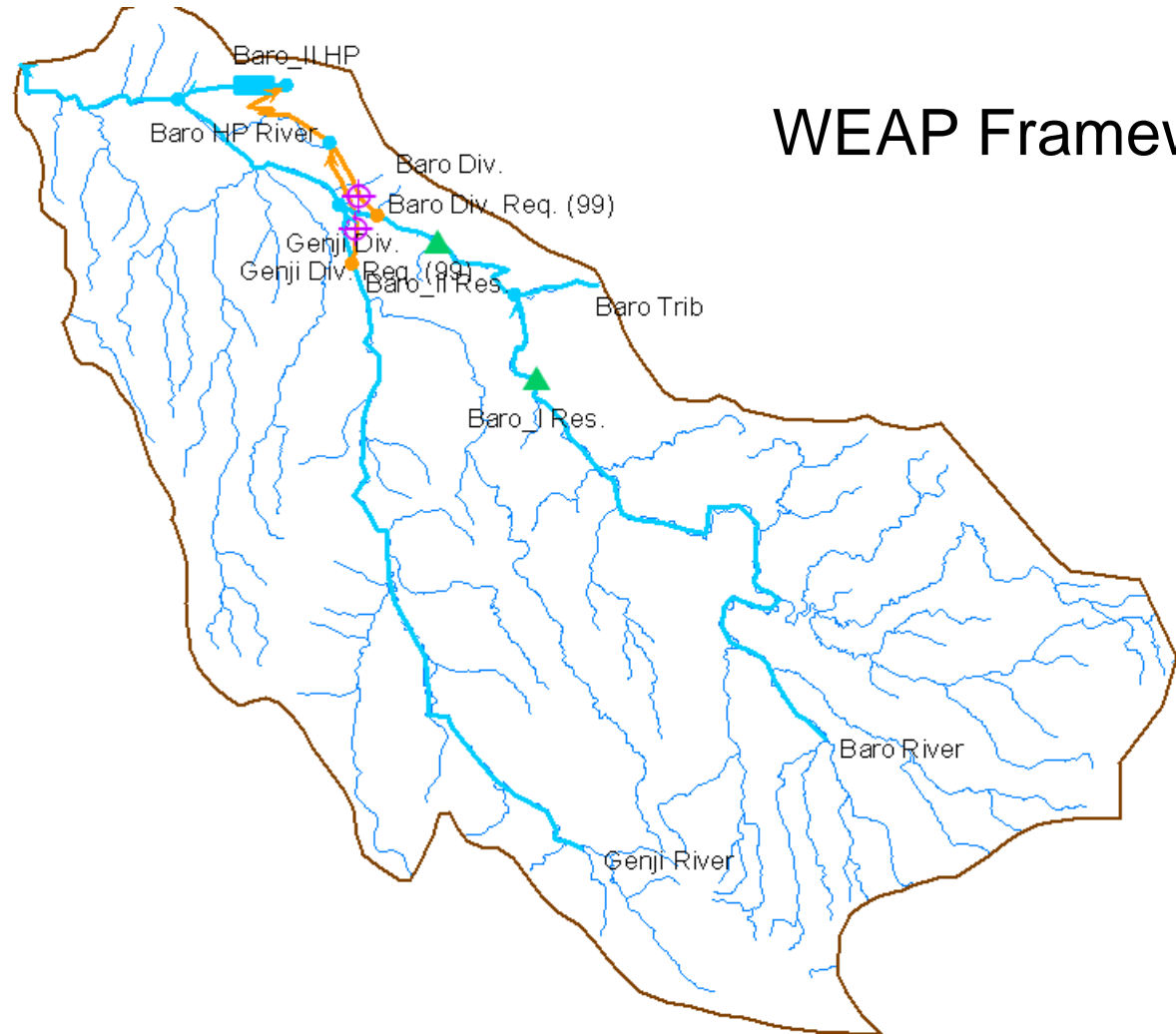


# Flow Scenarios ...



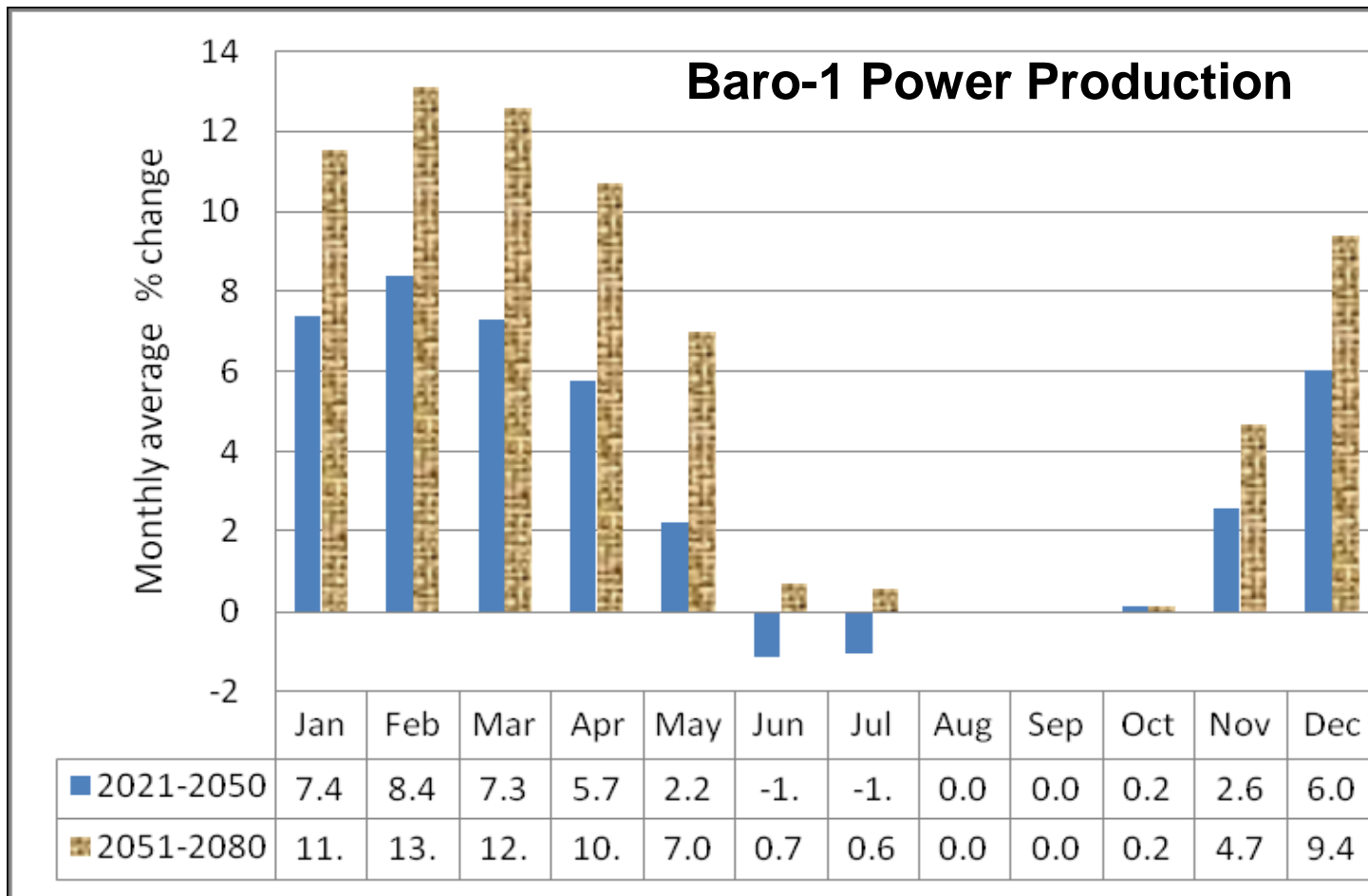
Period	Baro-1	Baro-2	Genji
2021-2050	4.78%	4.83%	4.14%
2051-2080	10.66%	10.74%	9.38%

# Climate Impact



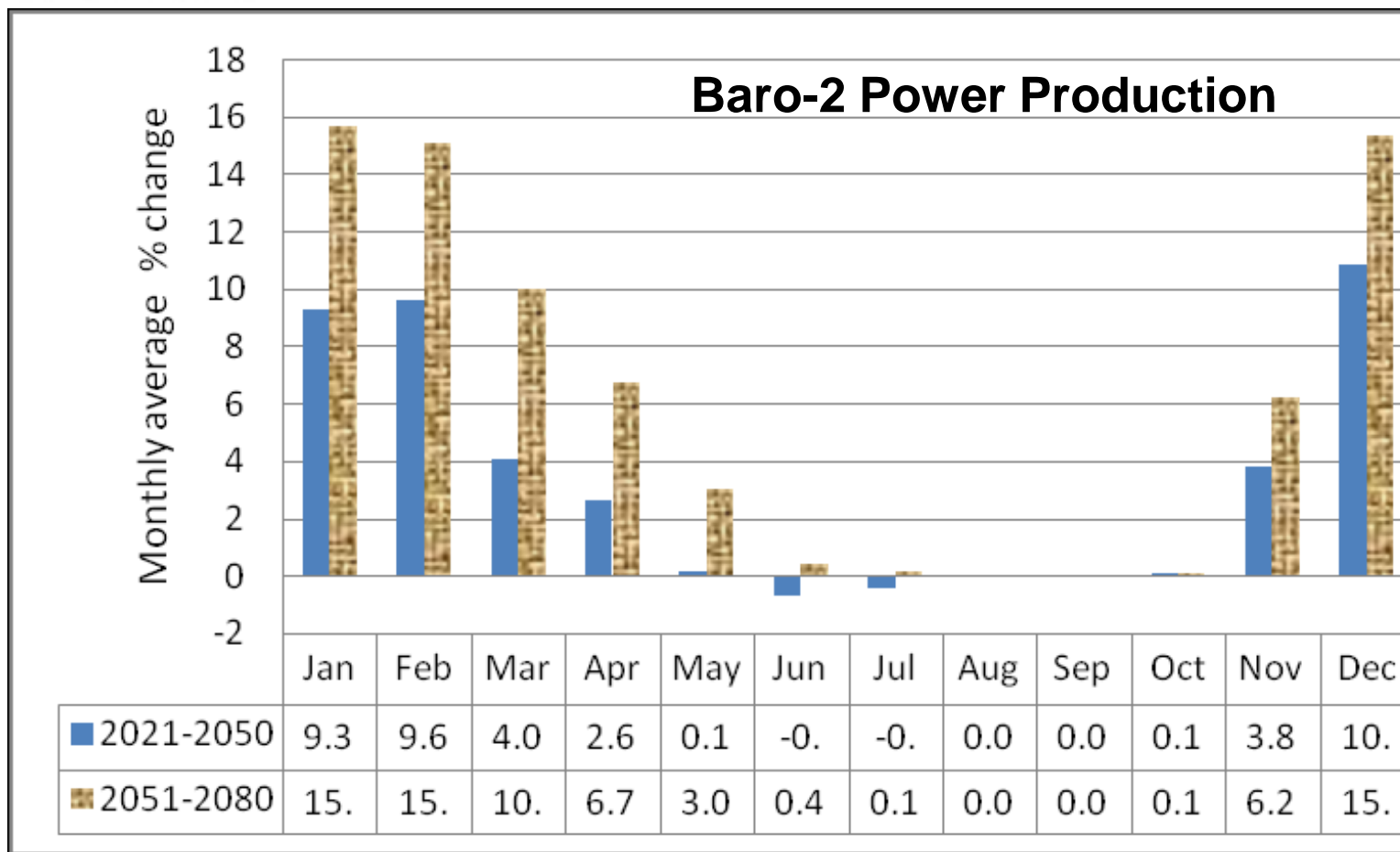
## WEAP Framework

# Climate Impact ...



**Annual**  
**2.2%**  
**4.4%**

# Climate Impact ...



**Annual**  
**2.3%**  
**4.3%**

# Conclusions

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Thank You!