

Climate, Land, Energy and Water systems (CLEWs)

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Modelling tools for sustainable development

Climate, Land, Energy and Water Systems

- Integrated assessment of resource systems
- Simultaneously explores matters pertaining to food, energy and water security
- Addresses trade-offs and synergies among policy goals
- Seeks to promote policy cohesion

Economy-wide modelling

- Computable general equilibrium representation
- Assesses the impact of policies, perturbations and shocks
- Explores impact on key economic indicators

**Support policies
for sustainable
development**

Geo-spatial electrification

- Cost effective strategies for electrification
- Comparison of technology options for electrification
- GIS based analysis
- Grid vs non-grid electrification

Micro-simulation

- Built on household survey data
- Variety of methodologies
- Studies impacts of policies, perturbations and shocks at the household level
- Social inclusion, distributional impacts, targeted impacts

Climate, Land, Energy and Water systems are highly linked



➤ Agriculture and energy sectors account for 90% of freshwater withdrawals



➤ Supply and treatment of water consumes approximately 4% of electricity, up to 10% in Middle East and India



➤ Crop production consumes 4–5% of final energy



➤ Bioenergy production uses an increasing share of cropland (15% of global maize and oil seed output now used for biofuels)

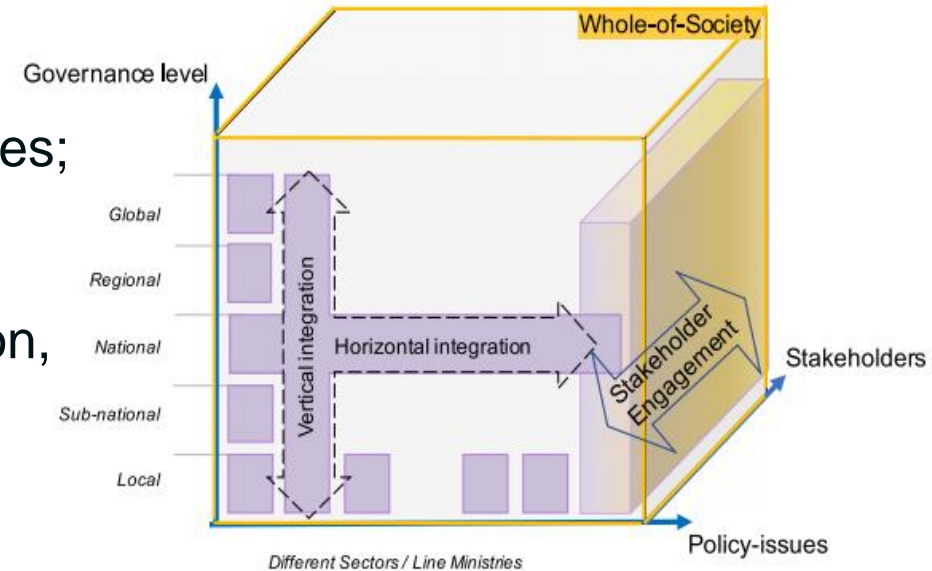


➤ Energy, agriculture and land-use change contribute more than 90% of GHG emissions

Need for policy coherence

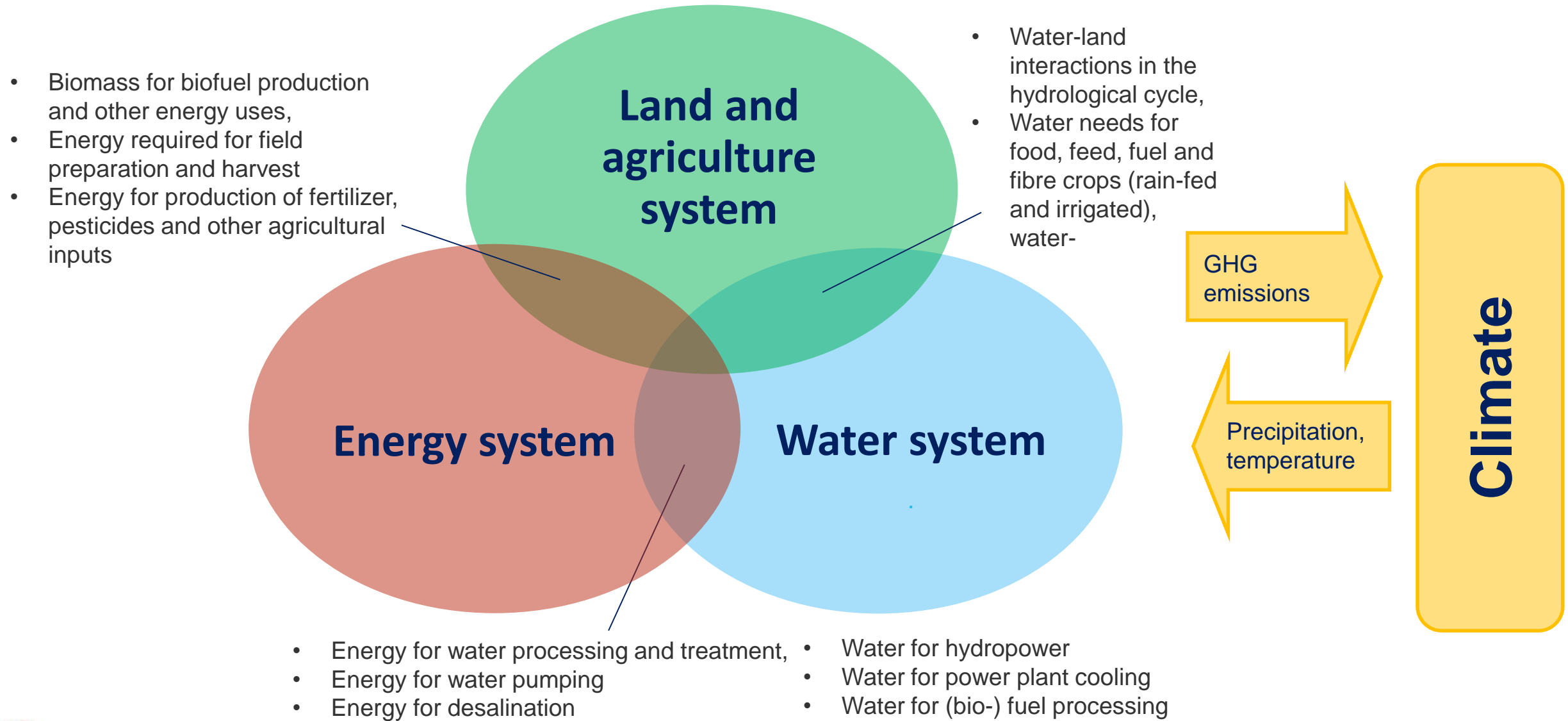
Policy coherence involves:

- (1) systematically identifying relevant linkages across the policy domains and consider those linkages in design of policies;
- (2) consistency across scales (from local to national) of implementation and domains;
- (3) involvement of relevant stakeholders in design, implementation, monitoring and evaluation;
- (4) provision adequate resources for implementation at all levels and at all scales



However, policy formulation and assessments are quite often done in isolation by separate and disconnected institutional entities.

Climate, Land, Energy and Water Systems (CLEWS)



The CLEWs framework in UN capacity development projects

Time horizon typically one or more decades

- Intended for longer term assessments and studies

Bottom-up analysis

- Representation of physical systems
- Full value chain (e.g. “well to wheel” or “field to fork”)
- Identify cost-effective strategies subject to constraints

Scenario based analysis

- Explores alternatives, risks and uncertainties through scenarios and sensitivity analysis
- Assesses the role of technology, technology choice and technology change
- Tests policies and measures

Flexible

- User chooses system boundaries
- User chooses level of detail
- User chooses geographical coverage



The CLEWs framework in UN capacity development projects

The aim is **not** to:

- Forecast or predict
- Be prescriptive

But rather to provide stakeholders with policy relevant:

- Insights into key inter-linkages and dynamics of the energy-food-water nexus
- Robust findings to support cohesion in policies and measures
- Knowledge of risks and opportunities



Modelling tools website

<https://un-modelling.github.io/about/>

MODELLING TOOLS FOR SUSTAINABLE DEVELOPMENT



ABOUT

MODELLING TOOLS

COUNTRY PROJECTS

OUTREACH TRAINING

NEWS AND EVENTS

CLEWS

ECONOMY-WIDE MODELS

SOCIOECONOMIC

ENERGY SYSTEMS

GEO-SPATIAL ELECTRIFICATION



MODELLING TOOLS FOR SUSTAINABLE DEVELOPMENT

Thank You!

For questions or further information please contact:

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