CIREG

Climate Information for Integrated Renewable Electricity Generation

CIREG tools & capacity building

WEAP/LEAP, an Analytical Platform to Explore the Water-Energy Nexus

Mbeo Ogeya

Devaraj de Condappa

SEI Stockholm Environment Institute

ERA4CS European Research Area for Climate Services

JPI Climate

Some objectives of the CIREG project…

- Deliver demand-driven climate services to support renewable electricity planning, implementation, and investment decisions.

- Provide information on risks and opportunities for renewable electricity solutions under climate change and variability.

Approach

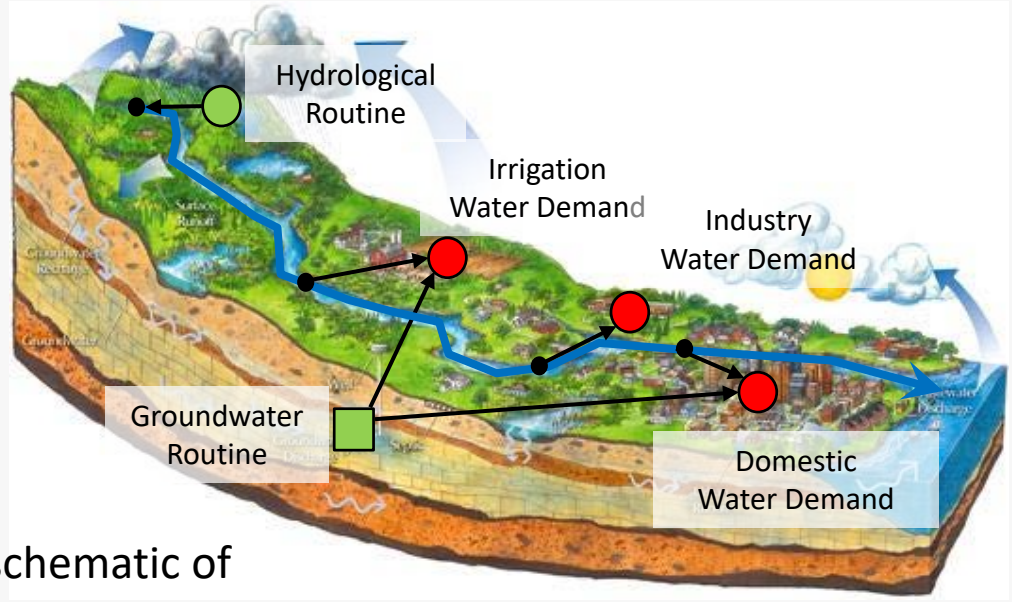
- Grasp stakeholders needs to increase relevance of climate services.
- Grasp relevant policies and national plans to include in the analysis.
- We propose to use the analytical tools **WEAP** (water) and **LEAP** (electricity), developed by the *Stockholm Environment Institute*.

Approach

- Use WEAP and LEAP to explore issues/scenarios relevant to the stakeholders.
- Trainings will be provided on WEAP and LEAP to the stakeholders in order:
  - to include scientific results and stakeholder expertise,
  - to explore with stakeholders scenarios of renewable electricity solutions under climate change.
- Dialogues events will be organised to report to decision makers the results of the WEAP/LEAP analysis.

Water Evaluation And Planning

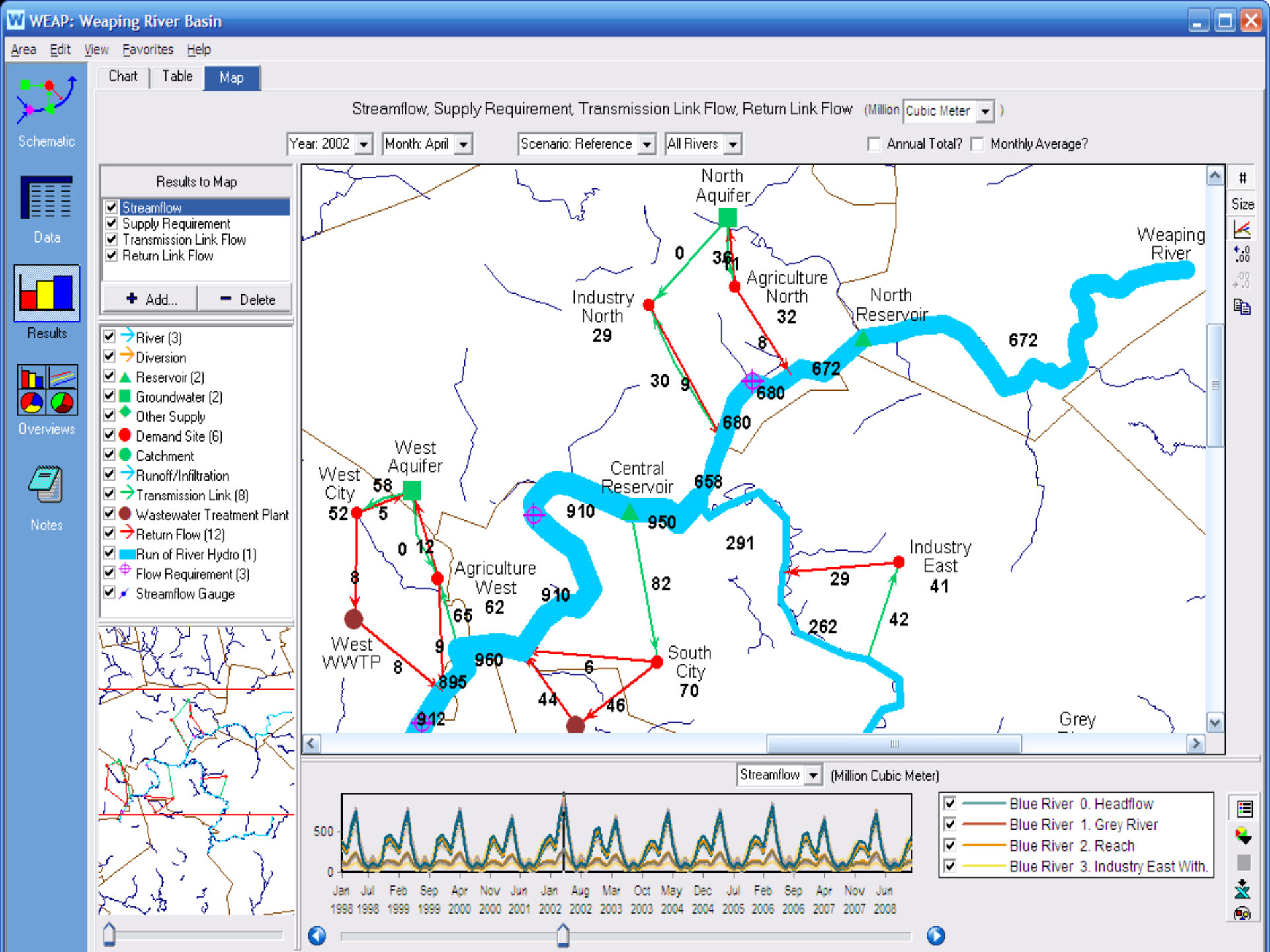
- Integrated watershed hydrology and water planning model :
  - natural processes: hydrological and groundwater modelling;
  - anthropogenic processes: water demands, dams, barrages, pipeline, canal systems etc.;
  - simulation of both supply and demand



Building a schematic of our system in WEAP

Water Evaluation And Planning

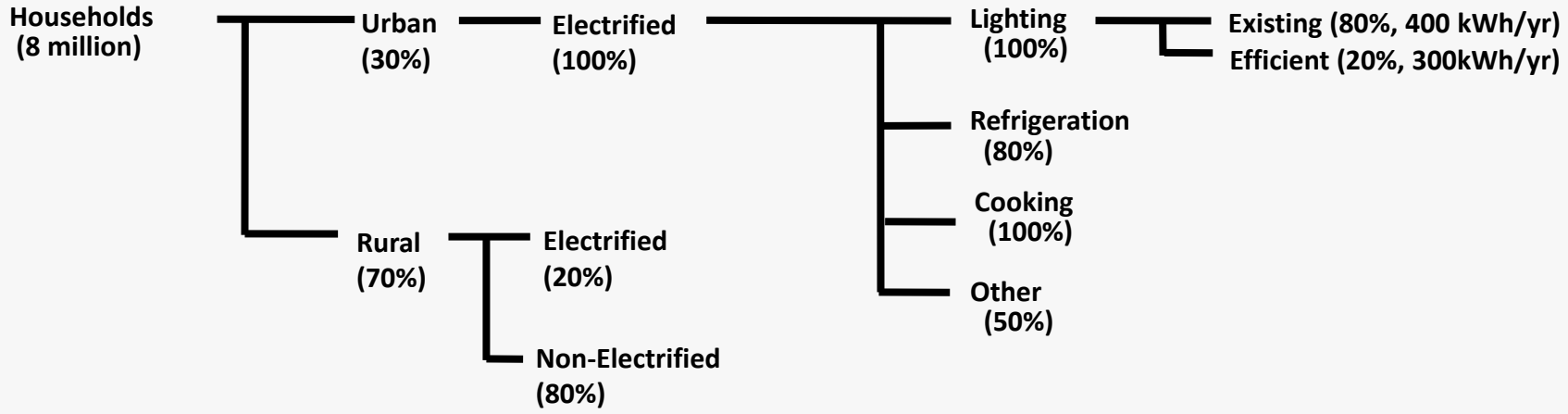
- GIS-based, graphical drag & drop interface.
- Scenario management capabilities.
- Groundwater, water quality, reservoir, hydropower and financial modules.
- Used in more than 180 countries.
- Has been developed for more than 25 years by the Stockholm Environment Institute (SEI).


WEAP: Weaping River Basin
Area Edit View Favorites Help
Schematic
Data
Results
Overviews
Notes
Chart Table Map
Streamflow, Supply Requirement, Transmission Link Flow, Return Link Flow (Million Cubic Meter)
Year: 2002 Month: April Scenario: Reference All Rivers
Annual Total? Monthly Average?
Results to Map
Streamflow
Supply Requirement
Transmission Link Flow
Return Link Flow
Add... Delete
River (3)
Diversion
Reservoir (2)
Groundwater (2)
Other Supply
Demand Site (6)
Catchment
Runoff/Infiltration
Transmission Link (8)
Wastewater Treatment Plant
Return Flow (12)
Run of River Hydro (1)
Flow Requirement (3)
Streamflow Gauge
North Aquifer
Weaping River
Industry North 29
Agriculture North 32
North Reservoir
West Aquifer
West City 52
Central Reservoir
Agriculture West 62
Industry East 41
West WWTP
South City 70
Grey
Size
Streamflow (Million Cubic Meter)
Blue River 0. Headflow
Blue River 1. Grey River
Blue River 2. Reach
Blue River 3. Industry East With.
500
0
Jan 1998 Jul 1998 Feb 1999 Sep 1999 Apr 2000 Nov 2000 Jun 2001 Jan 2002 Aug 2002 Mar 2003 Oct 2003 May 2004 Dec 2004 Jul 2005 Feb 2006 Sep 2006 Apr 2007 Nov 2007 Jun 2008

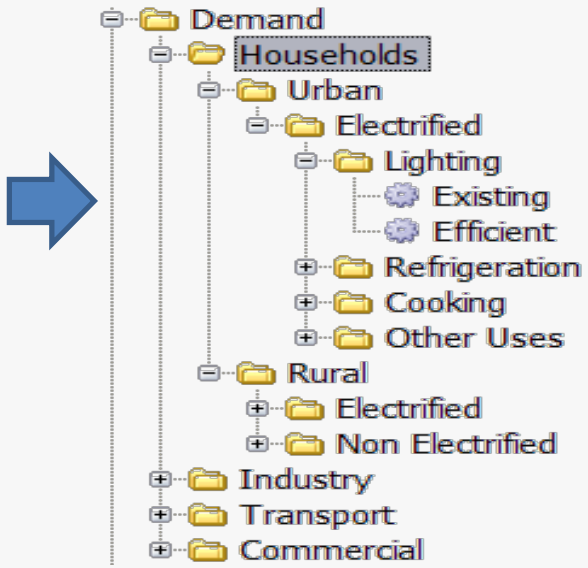
Long range Energy Alternatives Planning System

- Integrated energy planning and GHG mitigation assessment.
- Local, national, regional and global applicability.
- Powerful and user-friendly data management, reporting & scenario building tools.
- 1000s of users in 190 countries including Governments, NGOs, utilities, universities, consulting companies.
- Widely applied by countries undertaking GHG mitigation assessments for their National Communications to the UNFCCC, and for developing Low Emission Development Strategies (LEDS).
- Has been developed for more than 25 years by the Stockholm Environment Institute (SEI).

- A Simple Demand Data Structure:



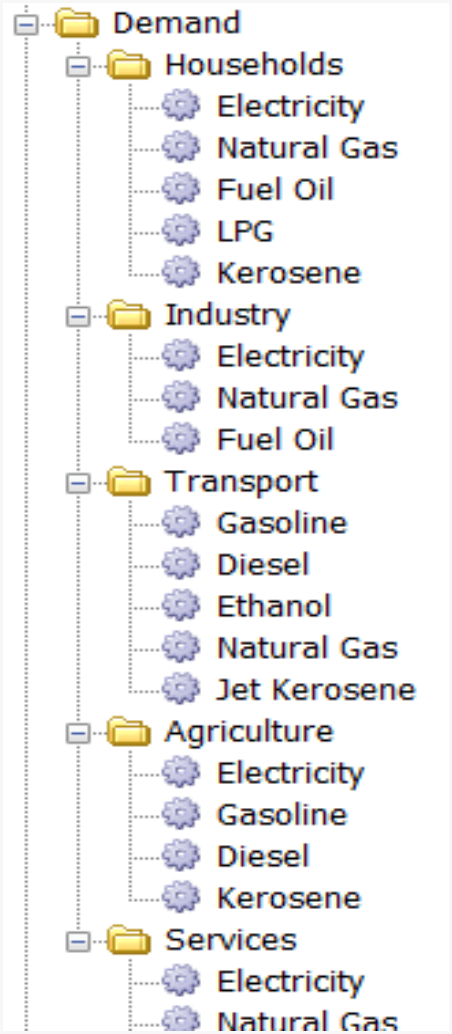
LEAP Tree structure



The tree is the main data structure used for organizing data and models, and for reviewing results.

- Representation of the different sectors and energy sources:

LEAP Tree structure



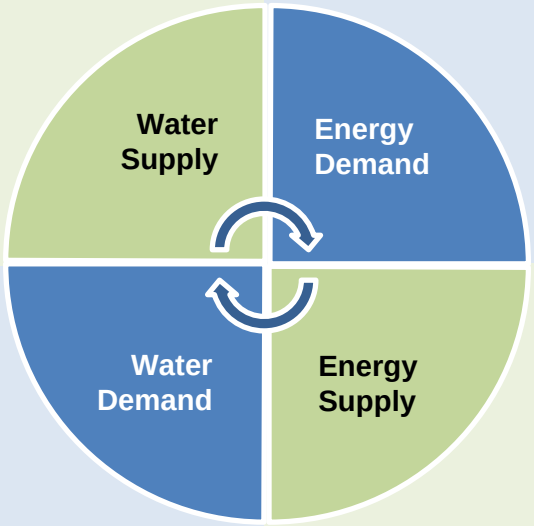
An example of energy consumption broken down only into sectors and fuels

WEAP/LEAP Coupling

- Water sector energy requirements
- Actual electricity generation based on water availability.

Examination of water availability to generate electricity from hydropower, solar

Electricity demand



Assumptions on renewable electricity generation (e.g., hydropower & solar)

Water requirements for hydropower & solar production

Let discuss together…

- During the group discussions.
- What is your experience / understanding of the Nexus Water – Energy?
- What are your knowledge gaps in terms of Nexus Water – Energy under climate change?
- Could these be examined with WEAP/LEAP?
- How to organise the training / capacity building sessions on WEAP/LEAP?
- How to organise dialogue sessions to report to decision makers?

Consortium partners

Potsdam Institute for Climate Impact Research

zef
Center for Development Research
University of Bonn

National funding organizations

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