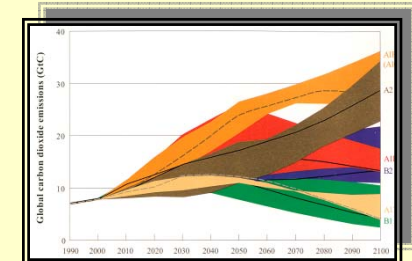
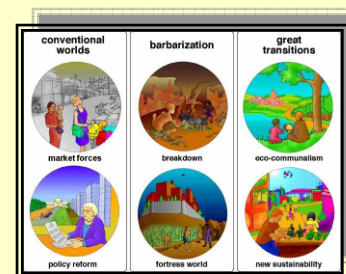
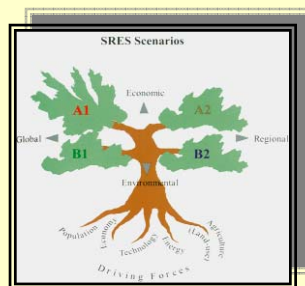


Expert Meeting on a Strategy for REDD Scenarios

Joseph Alcamo, UNEP

Nairobi ♦ 20-21 September 2011



Objectives



- How can scenario analysis help make the REDD+ Programme a success throughout the world?
 1. At the global level, how can scenarios support the progress of REDD+?
 2. How can scenarios help stakeholders plan a REDD+ programme?
 3. How can scenarios help stakeholders analyze/visualize the benefits and impacts of a REDD+ programme in a country?
- What are sketches of possible scenario projects in the Democratic Republic of Congo, Ecuador and other countries?
- How can scenario analysis help UNEP fulfill its mission to keep the global environment in review and present options for achieving sustainable development and the green economy?

UNEP Science Strategy



Goal 2. *Sustainability Scenarios*

Designing the Future:

UNEP makes a major effort to develop “solution-oriented, sustainability” scenarios.

Priority Actions

- 2.1 Build sustainability scenarios in UNEP projects**
- 2.2 Build sustainability scenarios in member states**
- 2.3 Institutionalize scenario building at UNEP**

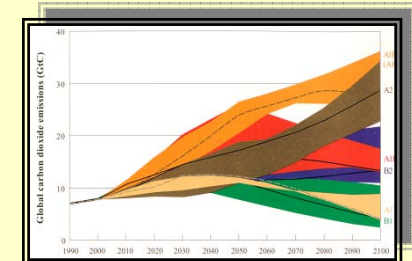
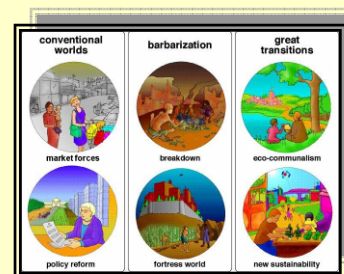
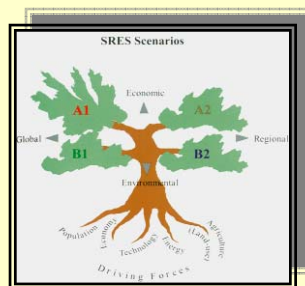


The Story and Simulation (SAS) Approach Applied to Water in the Jordan River Valley

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What exactly are scenarios?



What are Scenarios?

A plausible description of how the future may unfold based on 'if-then' propositions. A typical scenario includes a representation of the initial situation and a sequence of events that describe the key driving forces and the changes that lead to an image of the future.

What they are *not*: Extrapolations, predictions

What is Scenario Analysis?

Procedure: based on the development of scenarios, a comparison of scenario results, and an evaluation of their consequences.

Goal: anticipate future developments of society and the environment, and to evaluate strategies for responding to these developments. A key idea is to explore alternative future developments.

What kind of scenarios are there?



Deductive \longleftrightarrow Inductive

Exploratory \longleftrightarrow Anticipatory (Normative)

Qualitative \longleftrightarrow Quantitative

Qualitative \leftrightarrow Quantitative

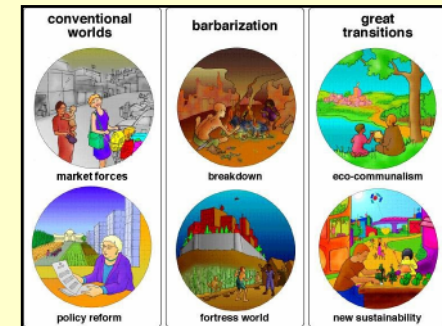
Qualitative Scenarios

In form of:

- **visual symbols:** diagrams; pictures
- **words:** written phrases, outlines

Most common form:

Storylines – Narrative description of scenario, highlighting main features, and relationship between driving forces and main features.





Qualitative Scenarios: Storyline

(Excerpt of “Modest Hopes” Storyline from GLOWA-Jordan Scenario Study)

“Cease-fire in Gaza and West Bank”

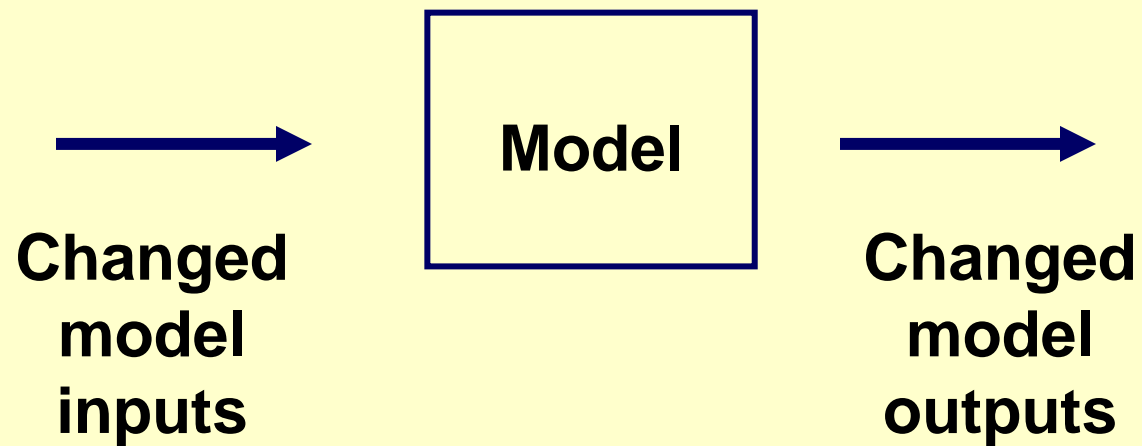
The positive atmosphere caused by the revived peace process, together with the challenge of coping with water-related catastrophes, finally leads to a measure of cooperation between states in the region. One of the first signs ... is that regional governments ... agree to a modification of some water allocations between states ...

“NETAFIM opens branches in Gaza and Nablus”

... A new factory for constructing buildings is opened in Tulkarem and the Israeli producer of state-of-the-art irrigation systems (NETAFIM) opens branches in Gaza and Nablus. Ten thousand work permits are issued by Israel for Palestinians.

Quantitative Scenarios

- Numerical information
- Commonly computed with models

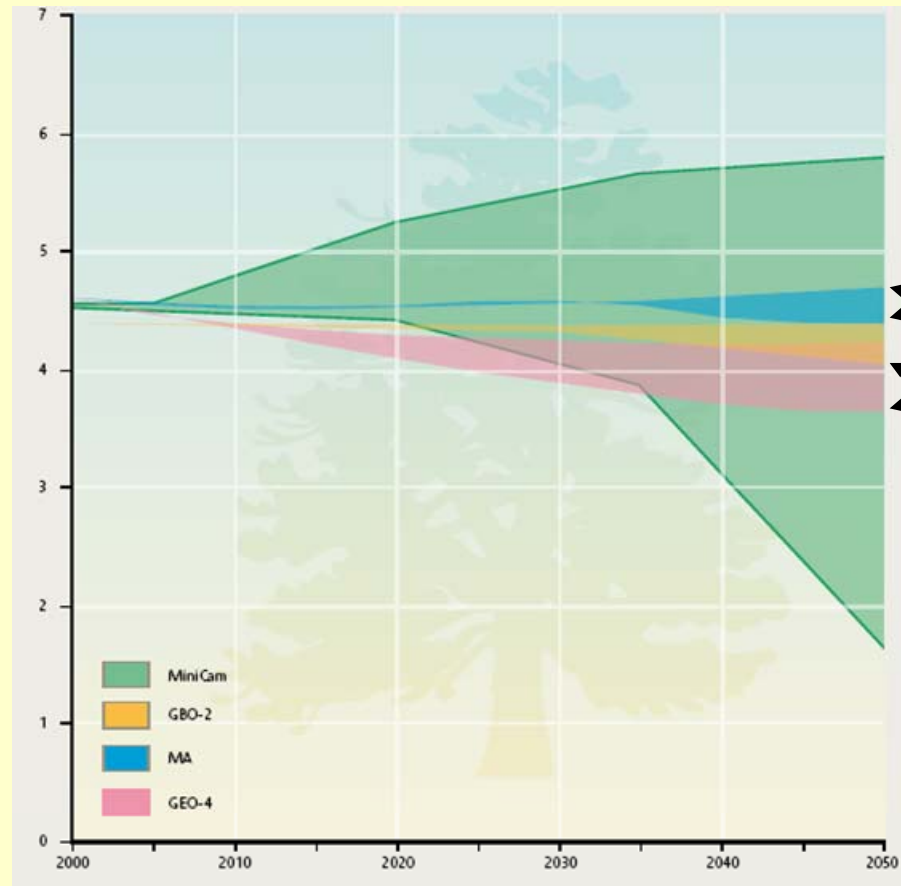


Quantitative Scenarios

Scenarios of global forest loss up to 2050



Global forest cover
(10⁹ ha)



2000

Year

2050

Source: Global
Biodiversity Outlook 3

Range of quantitative
scenarios computed
by individual models



Advantages/Disadvantages

Qualitative Scenarios

Advantages: Understandable, interesting; represent views and complexity of many different interests.

Disadvantages: Arbitrary, tough to identify or test underlying assumptions; do not provide numerical information.

Quantitative Scenarios

Advantages: “Scientific” (based on models); Numerical information; can identify underlying assumptions.

Disadvantages: Models have limited view of the world and are often not transparent; exactness gives illusion of certainty.

Having it all: The Story and Simulation (SAS) Approach



A type of scenario analysis ...

- ... that produces both **qualitative** information (storylines) and **quantitative** information (model calculations) and combines their advantages
- ... is an **iterative process** engaging both stakeholders and environmental modelers

SAS-type scenario studies:

IPCC (emission scenarios); Millennium Ecosystem Assessment;
UNEP Global Environmental Outlook – 4; World Water Commission,
Glowa-Jordan River Project



GLOWA

SAS Approach - Who is involved?

(Example - GLOWA Scenarios Exercise on the Jordan River Valley)

Scenario Panel: Stakeholders. Representatives from water & agriculture ministries of Israel, Jordan, and Palestinian Authority; NGOs; scientific advisors. → *Develop qualitative scenarios (“storylines”).*

Scenario Team: Scientists + consultants → *Facilitate and coordinate scenario exercise.*

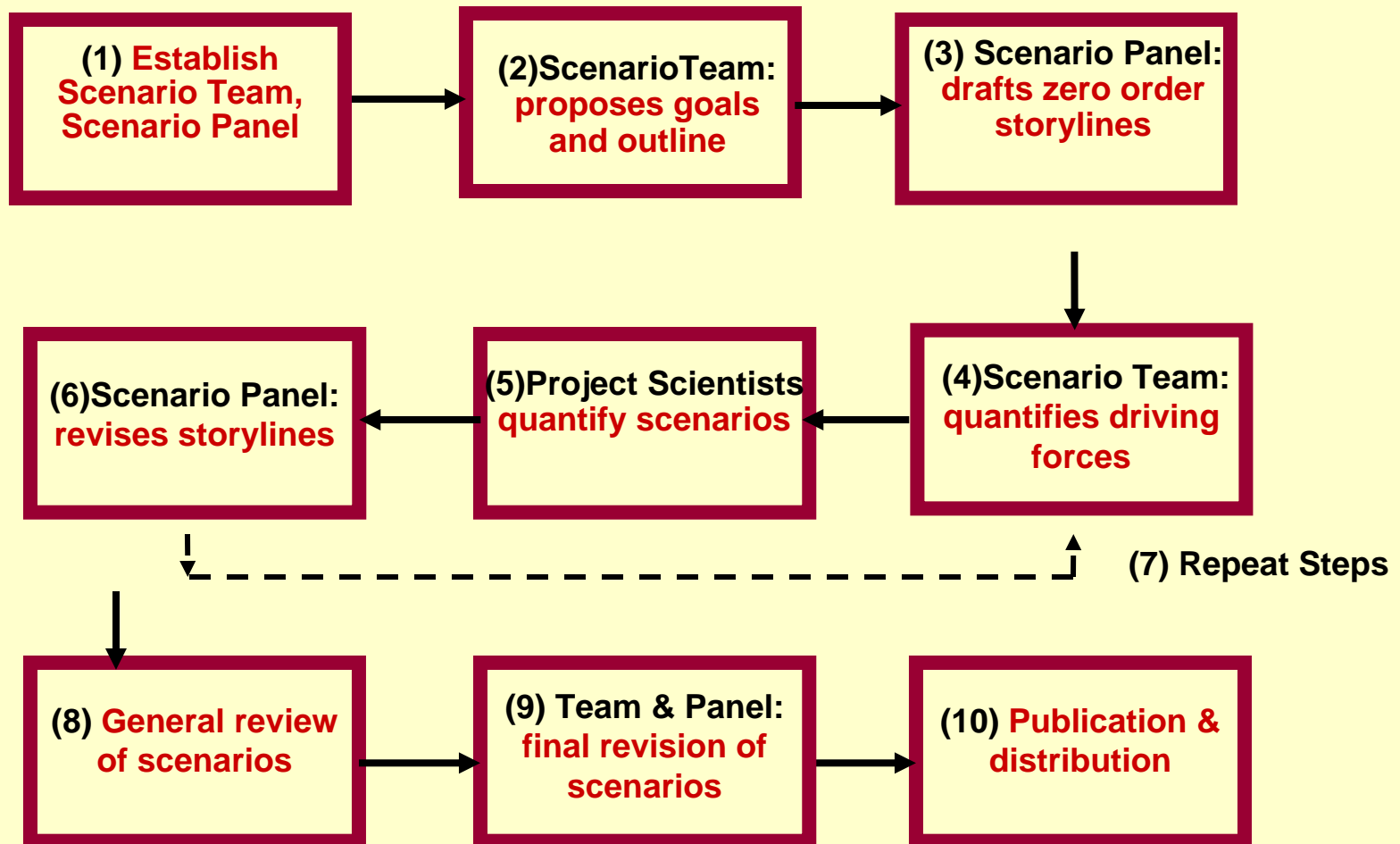
Project Scientists: Partners from scientific sub-projects → *“Quantify” scenarios (with modeling and other analyses)*



GLOWA

SAS Procedure

(Example - GLOWA Scenarios Exercise on the Jordan River Valley)



Advantages/Disadvantages SAS Approach

Disadvantages of SAS

1. Resource-intensive, time-consuming, expensive
2. Requires good moderators, computer models
3. Linkage between qualitative & quantitative difficult

Advantages of SAS

1. An *“open” approach* → Stakeholders are involved in core activities, interested parties can comment on and contribute to the scenarios
2. An *iterative process* → Enhances involvement & interaction between writers, experts, modelers, & stakeholders
3. *Combines advantages* of qualitative (understandable, complex dimensions) and quantitative scenarios (consistency check, provides quantitative data, published).



GLOWA

GLOWA – Jordan River

Case Study:

The SAS Approach:

The GLOWA-Jordan scenario analysis

Glowa-J Scenario Exercise



Goals

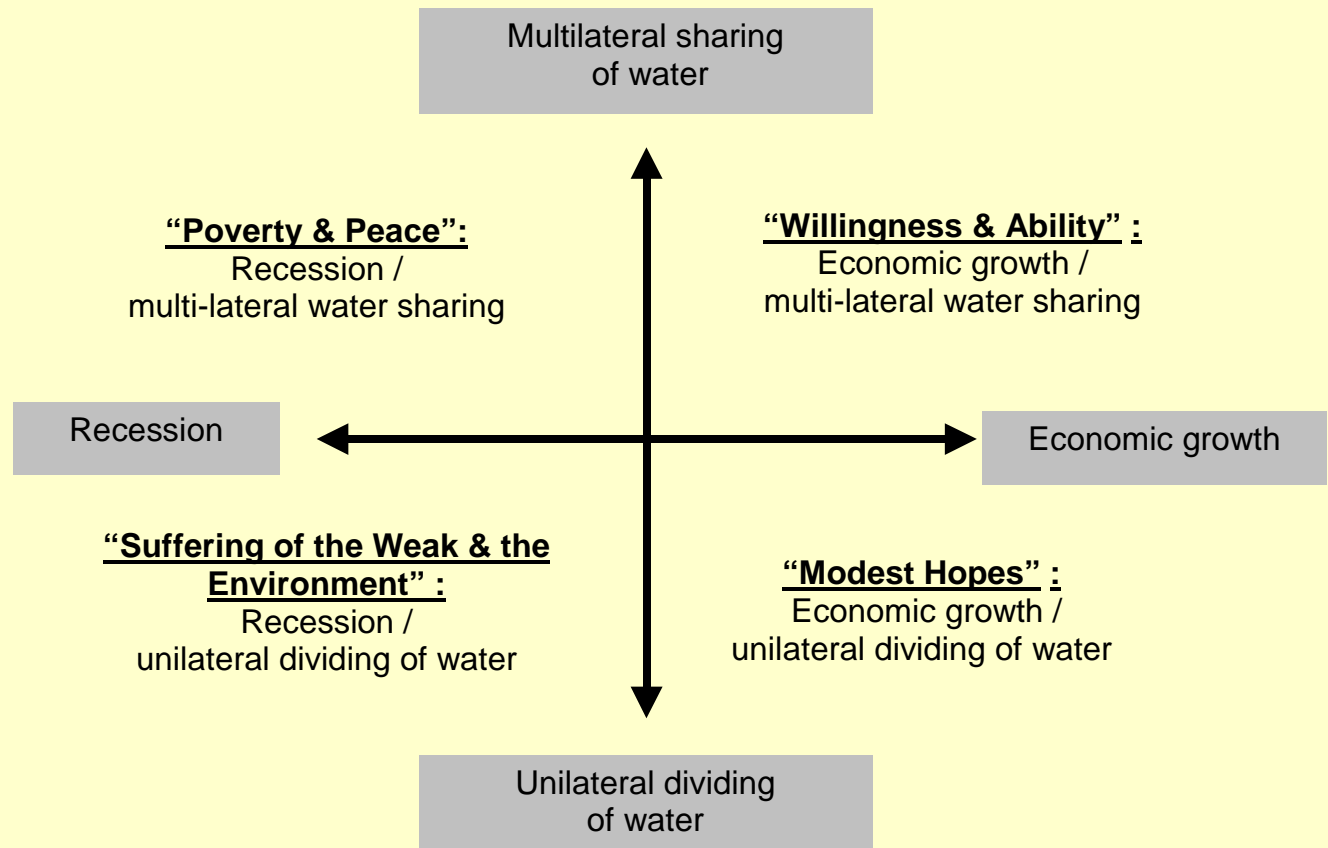
- Provide new knowledge about impacts of global & regional change on water resources in the region
- Explore new ideas on adapting to changes through sustainable water management
- Engage Israelis, Jordanians and Palestinians



GLOWA

Glowa-J Scenario Exercise

Qualitative scenarios: Comprehensive storylines of regional development under global change



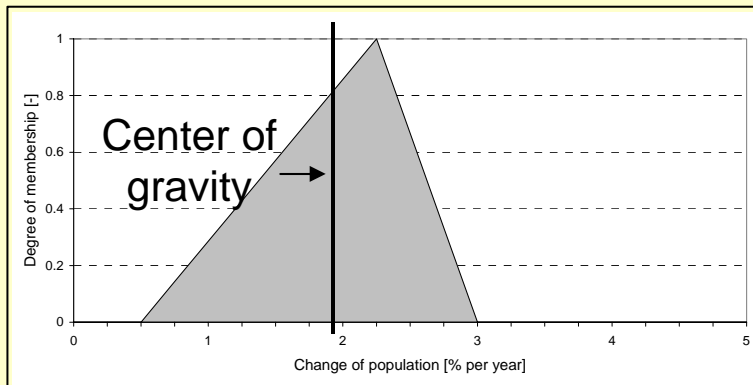
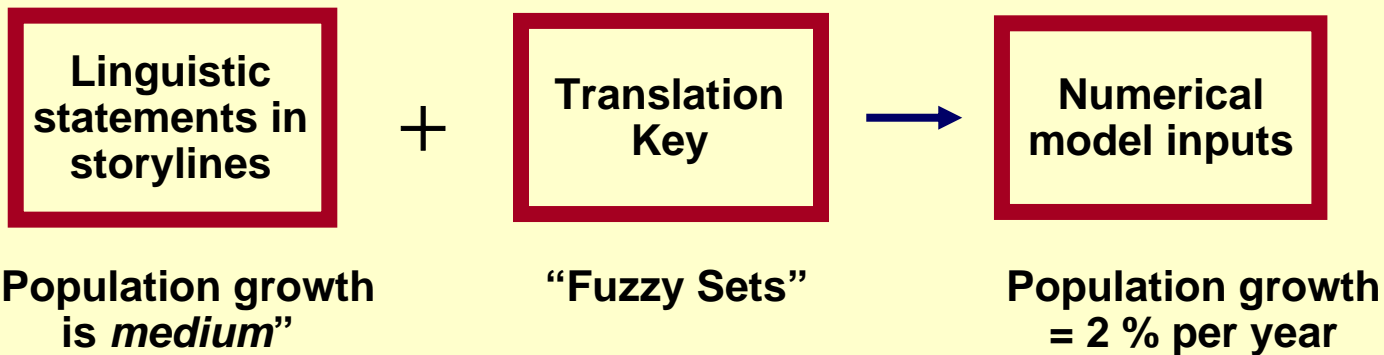


GLOWA

Glowa-J Scenario Exercise

Linking qualitative and quantitative scenarios

Going from Storylines to Models



“Fuzzy membership function”

Objective translation:
linguistic statement “medium increase of population” → model input

Glowa-J Scenario Exercise

Going from Storylines to Models

GLOWA Jordan River Valley Scenarios
Population Growth – “Modest Hope” Scenario

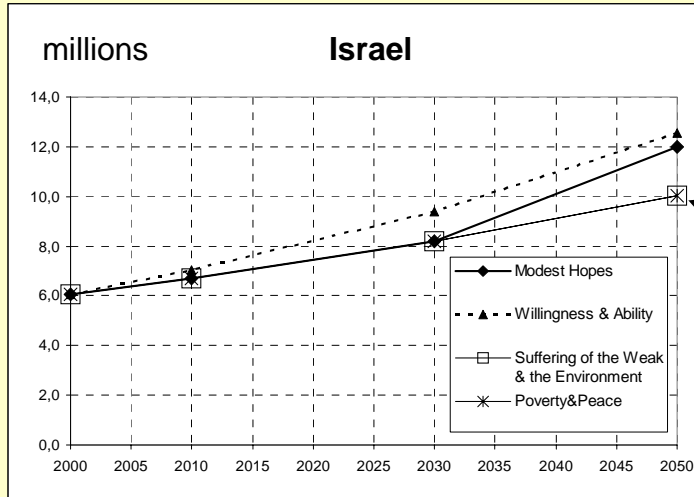
| Scenario period | State | Rate of Change of Population | |
|-----------------|-----------|------------------------------|------------------------------|
| | | Storyline | Model Input (% per annum) |
| 2008-2010 | Israel | “Small increase” | 1 |
| | Jordan | “Medium increase” | 1.9 |
| | Palestine | “High increase” | 3.7 |
| 2025-2030 | Israel | “Small increase” | 1 |
| | Jordan | “Medium increase” | 1.9 |
| | Palestine | “High increase” | 3.7 |
| 2050 | Israel | “Small increase” | 1 |
| | Jordan | “Medium increase” | 1.9 |
| | Palestine | “High increase” | 3.7 |



GLOWA

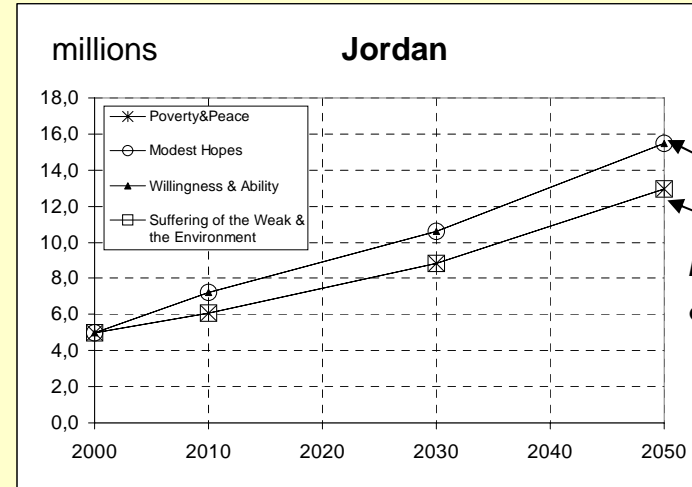
Driving Forces of Change:

Population



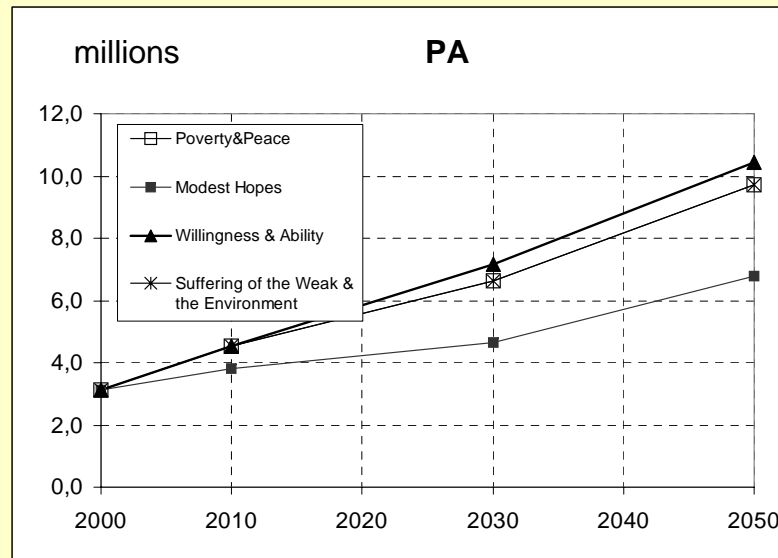
Modest Hopes

Poverty & Peace



Modest Hopes

Poverty & Peace



Poverty & Peace

Modest Hopes

Source: Stakeholders, GLOWA-J scenario exercise (2007)

plausibility



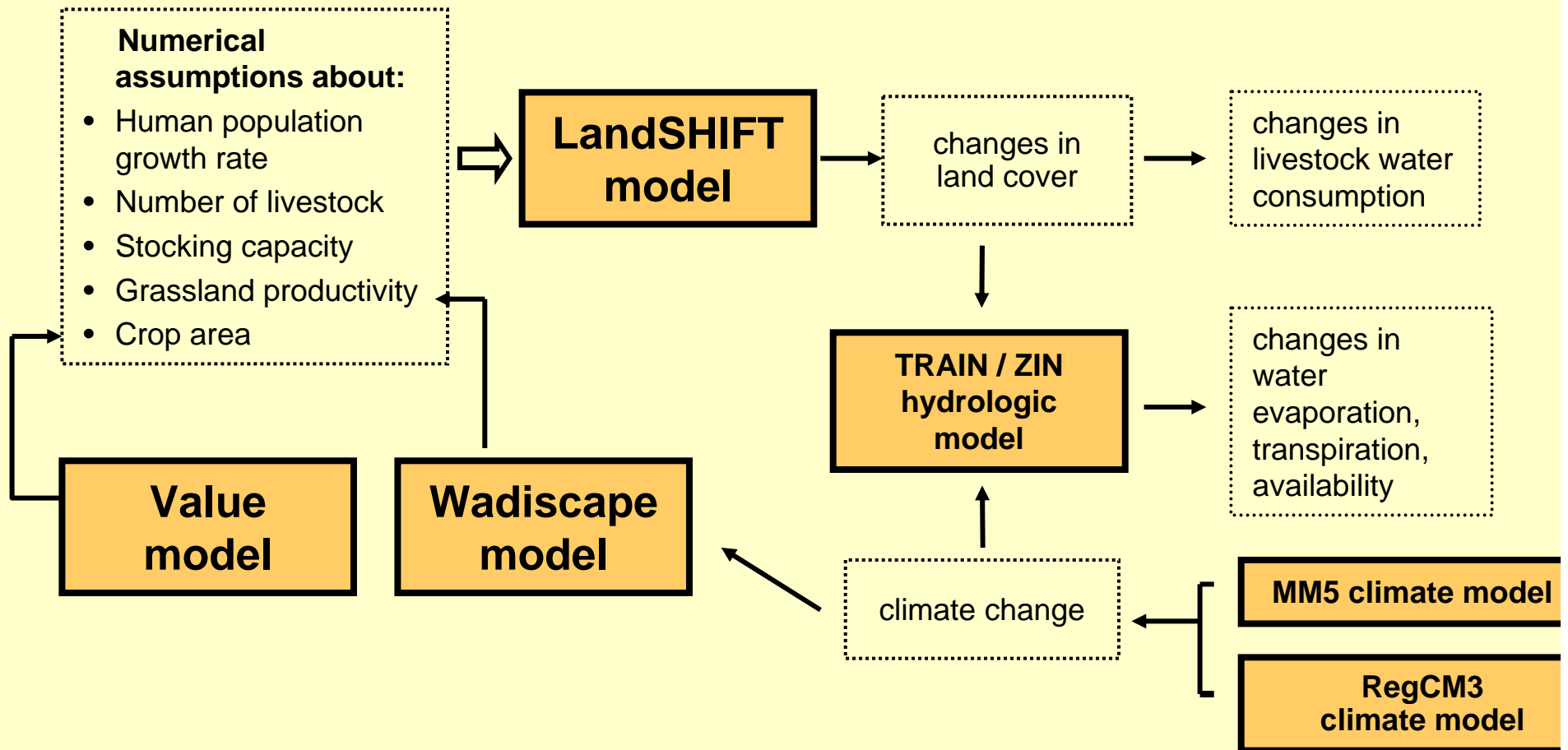
GLOWA

Glowa-J Scenario Exercise

Storylines



Quantitative scenarios: Coupled modeling





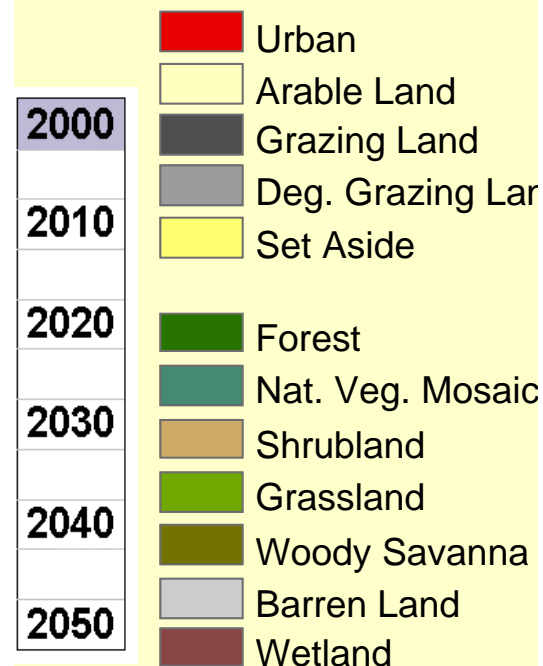
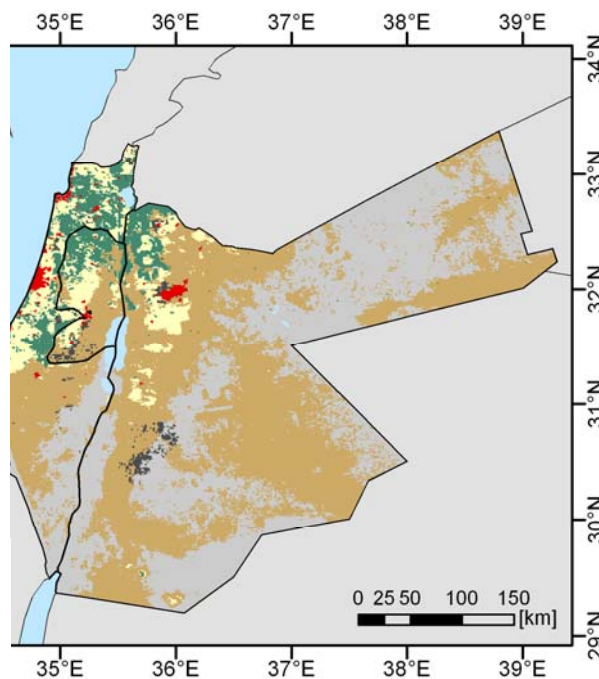
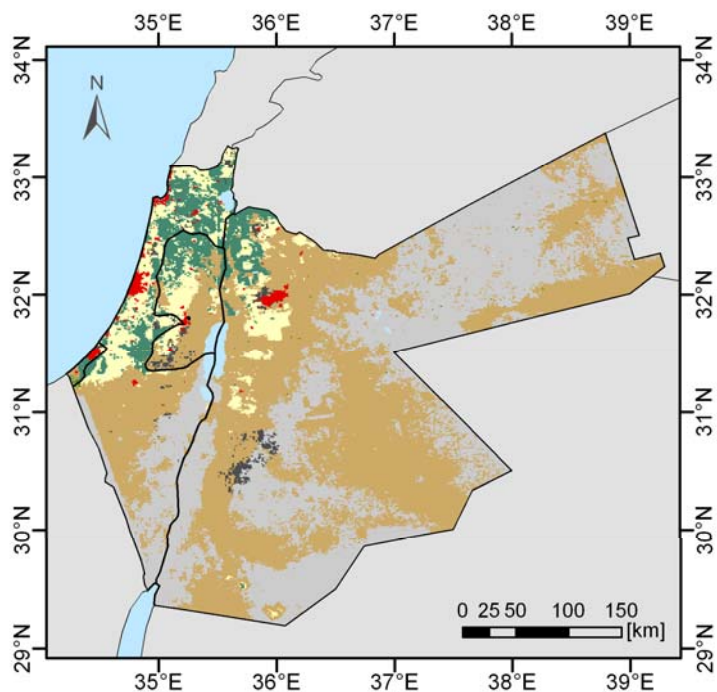
GLOWA

Land Use Scenarios

Land Use/Land Cover 2000-2050
LandSHIFT Model Simulation

Modest Hopes

Poverty and Peace



Source: Koch & Schaldach,



GLOWA

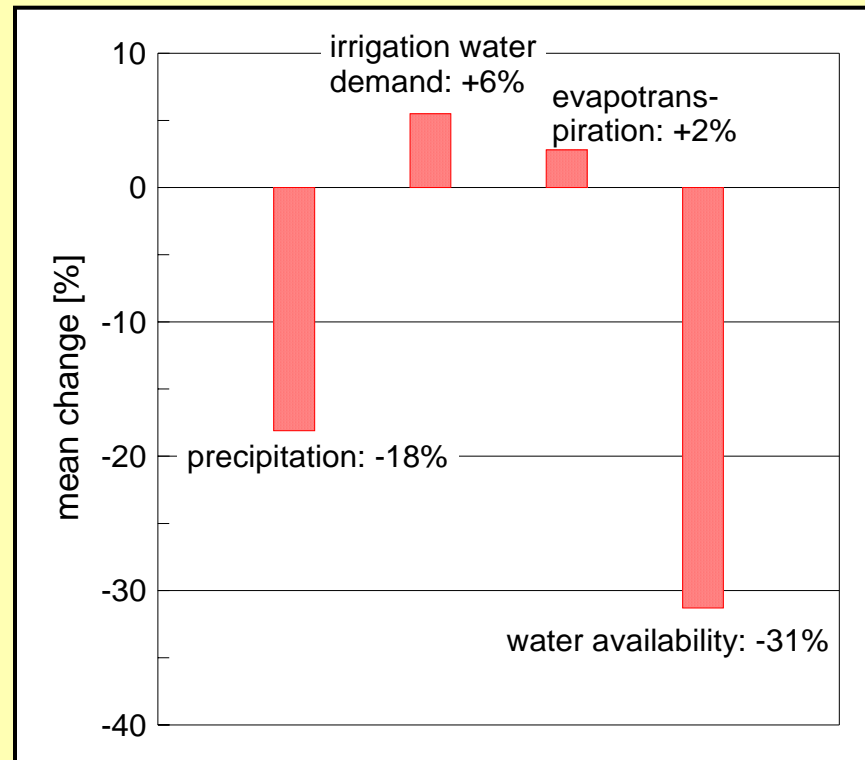
Regional Water Balance

Change in water balance
Lower Jordan Valley

Under land cover change
and climate change
(A1b scenario)
Up to 2041-2050

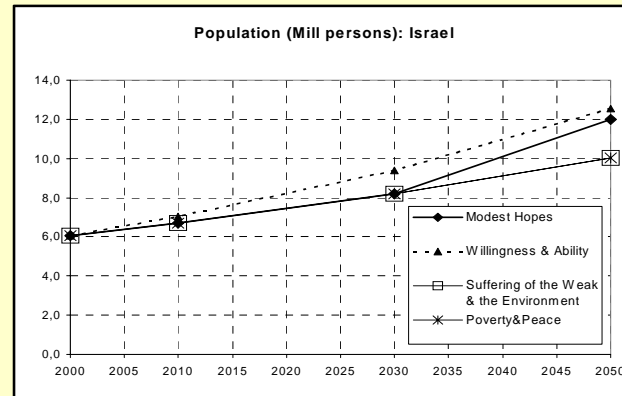
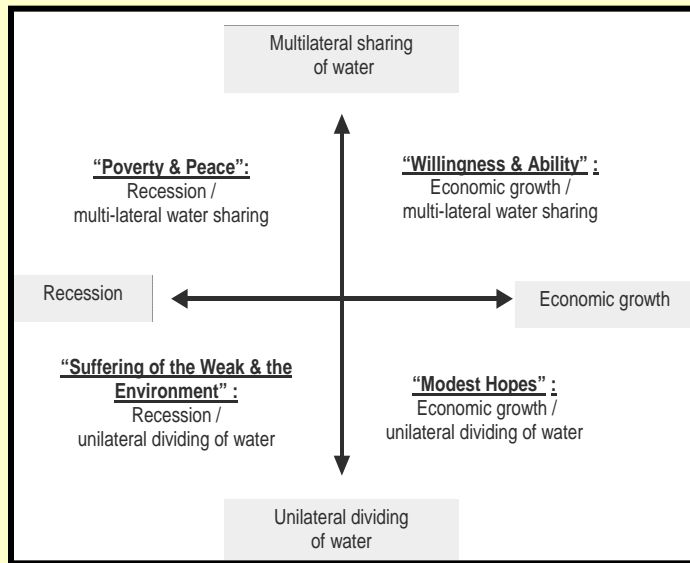
Water balance: TRAIN model
(Menzel)

Climate change calculations
with ECHAM5 & RegCM3 models
(Alpert, Krichak, Kunin)



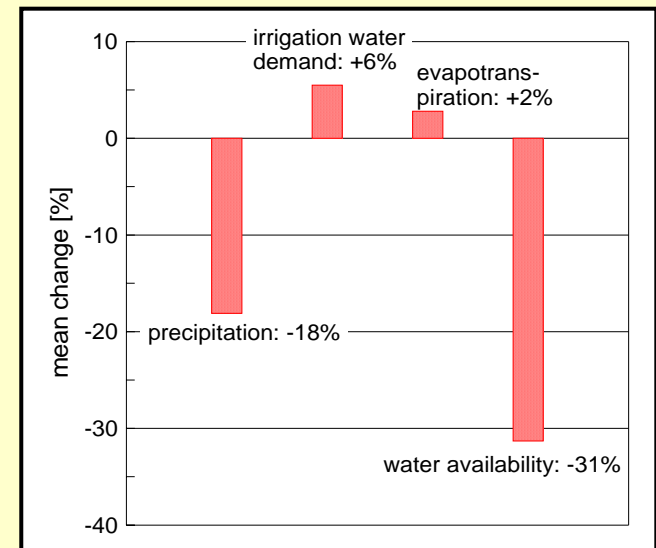
Result: Scenarios with consistent qualitative (storylines) & quantitative (model calculations) details → basis for testing management options

Storylines 2005-2050

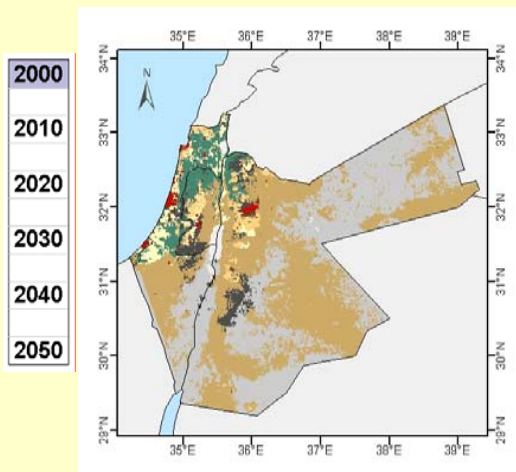


Quantified drivers: e.g. population

Quantitative outputs: e.g. changing water balance Lower Jordan



Quantitative outputs: e.g. Land use & cover



- Urban
- Vegetables/Fruits/Crops
- Other Crops
- Grazing Land
- Deg. Grazing Land
- Set Aside
- Forest
- Nat. Veg. Mosaic
- Shrubland
- Grassland
- Woody Savanna
- Barren Land
- Wetland

Possible Applications of Scenario Analysis to REDD+



- 1. How can scenarios support the progress of REDD+ ?**
Qualitative scenarios show how REDD+ 'financing' and infrastructure investments can contribute to delivering multiple benefits for climate, development and conservation
- 2. How can scenarios help stakeholders plan a REDD+ programme ?**
Develop qualitative scenarios to envision institutional steps for planning and implementing a REDD+ programme in a country.
- 3. How scenarios could help stakeholders analyze/visualize the benefits and impacts of a REDD+ program in a country:**
Develop qualitative/quantitative scenarios of future land use change, reduced deforestation, afforestation, and uptake of carbon in a country resulting from future REDD+ programmes. (Storylines + modeling analysis)

Conclusions

Scenario analysis – Versatile tool to imagine the future; an aid to managing complex problems of the environment

Many different types of scenarios - qualitative and/or quantitative scenarios – depending on need

Scenarios can enhance the strategic thinking and planning in UN-REDD+ Programme.

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