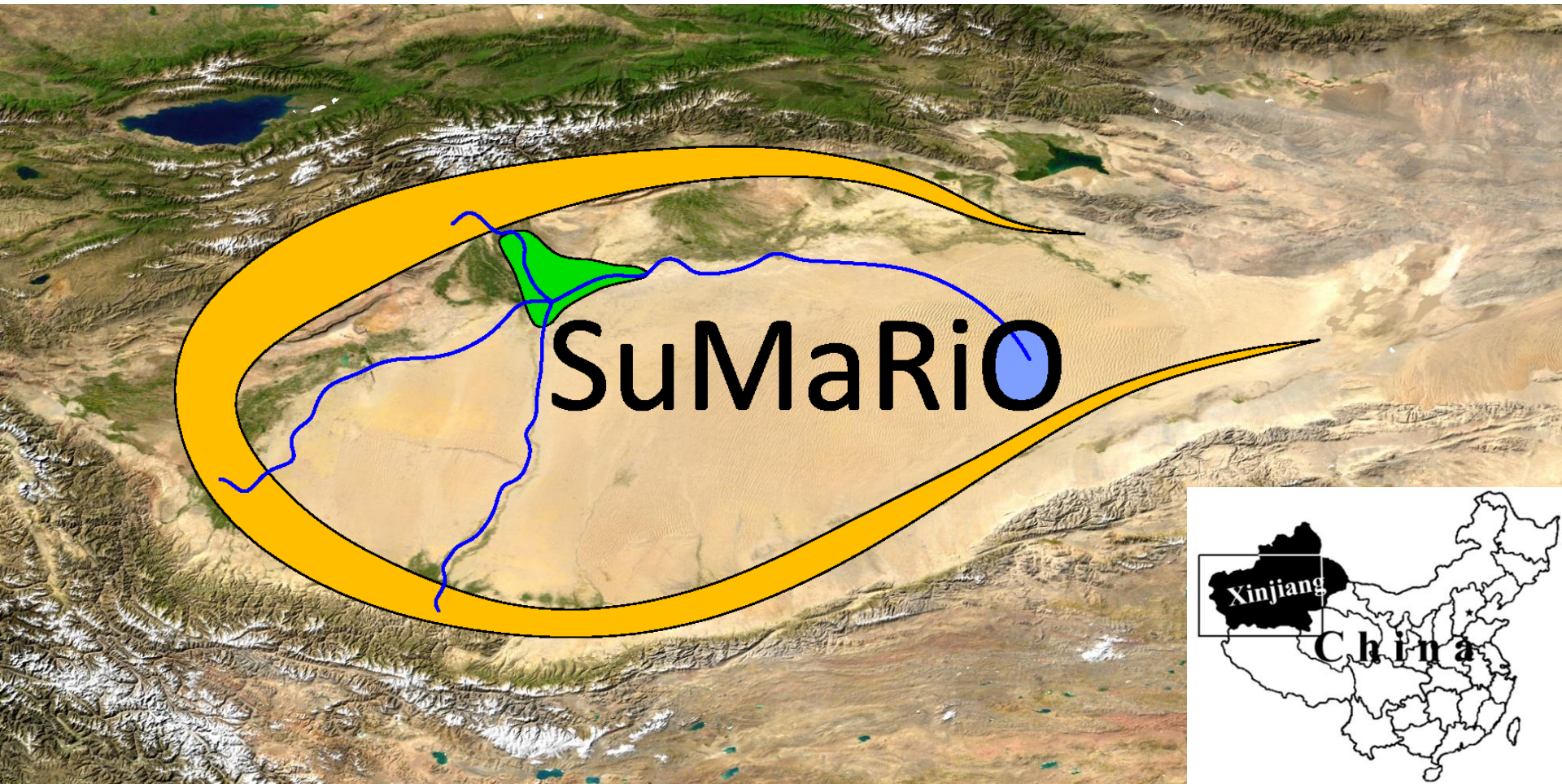


Sustainable Management of River Oases along the Tarim River (SuMaRiO) and the implementation of goals of the UNCCD and the UNCBD

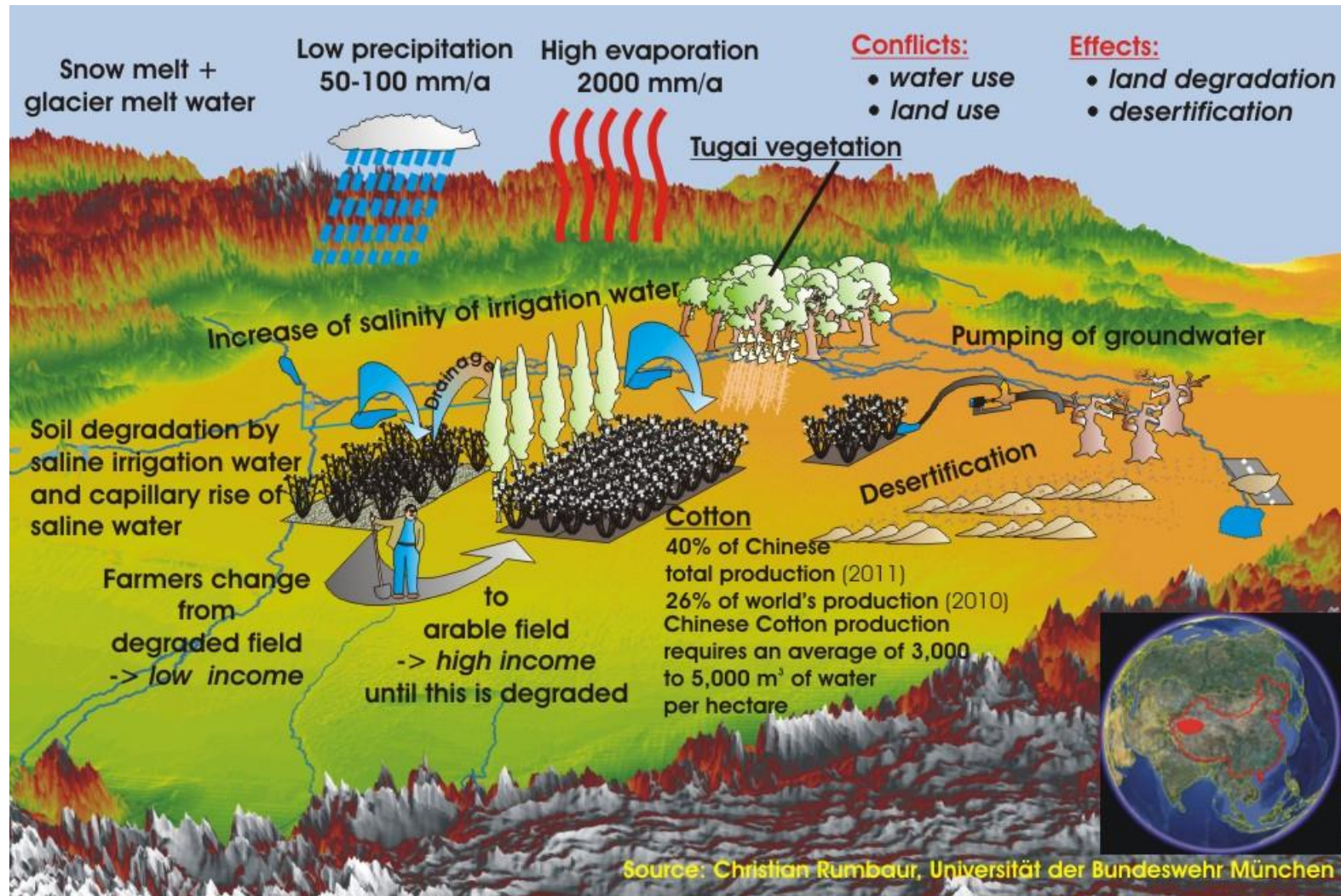


The project consortium comprises **eleven German** and **nine Chinese** Universities and Research Institutions and various **Chinese Stakeholders**

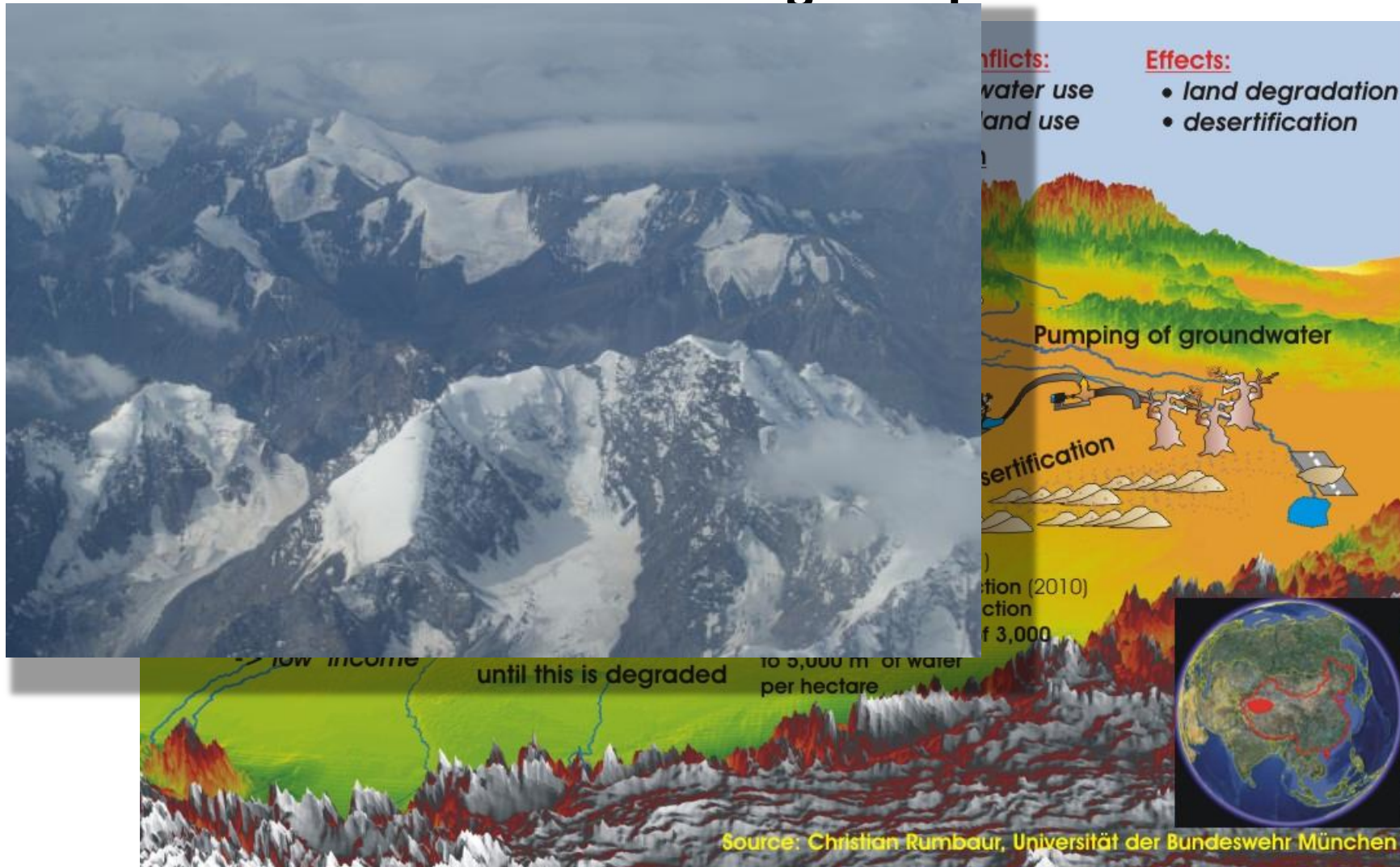


The project started in March **2011** and will end in February **2016**

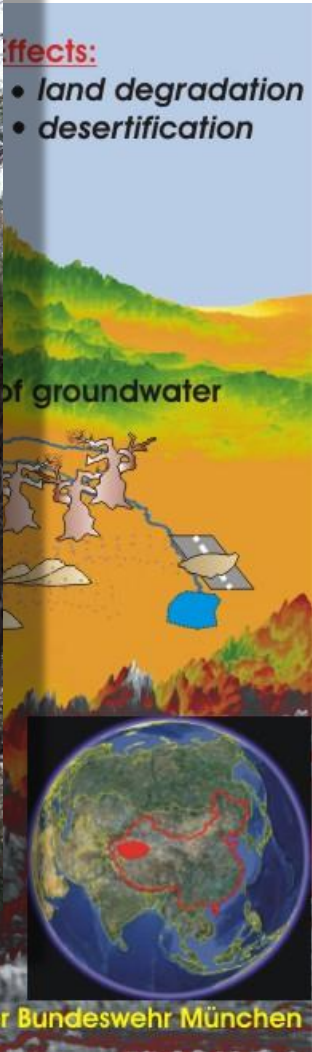
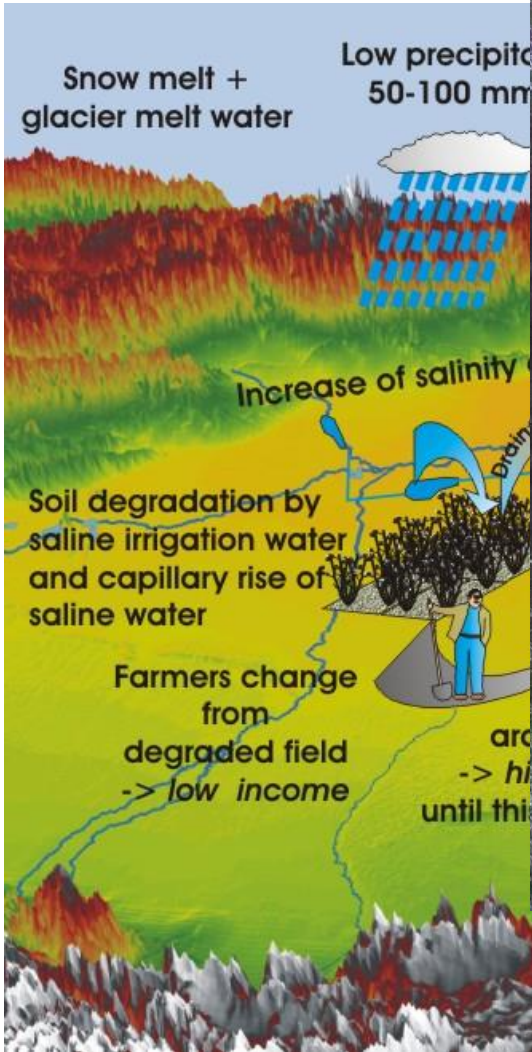
Outline of the regional problem



Outline of the regional problem

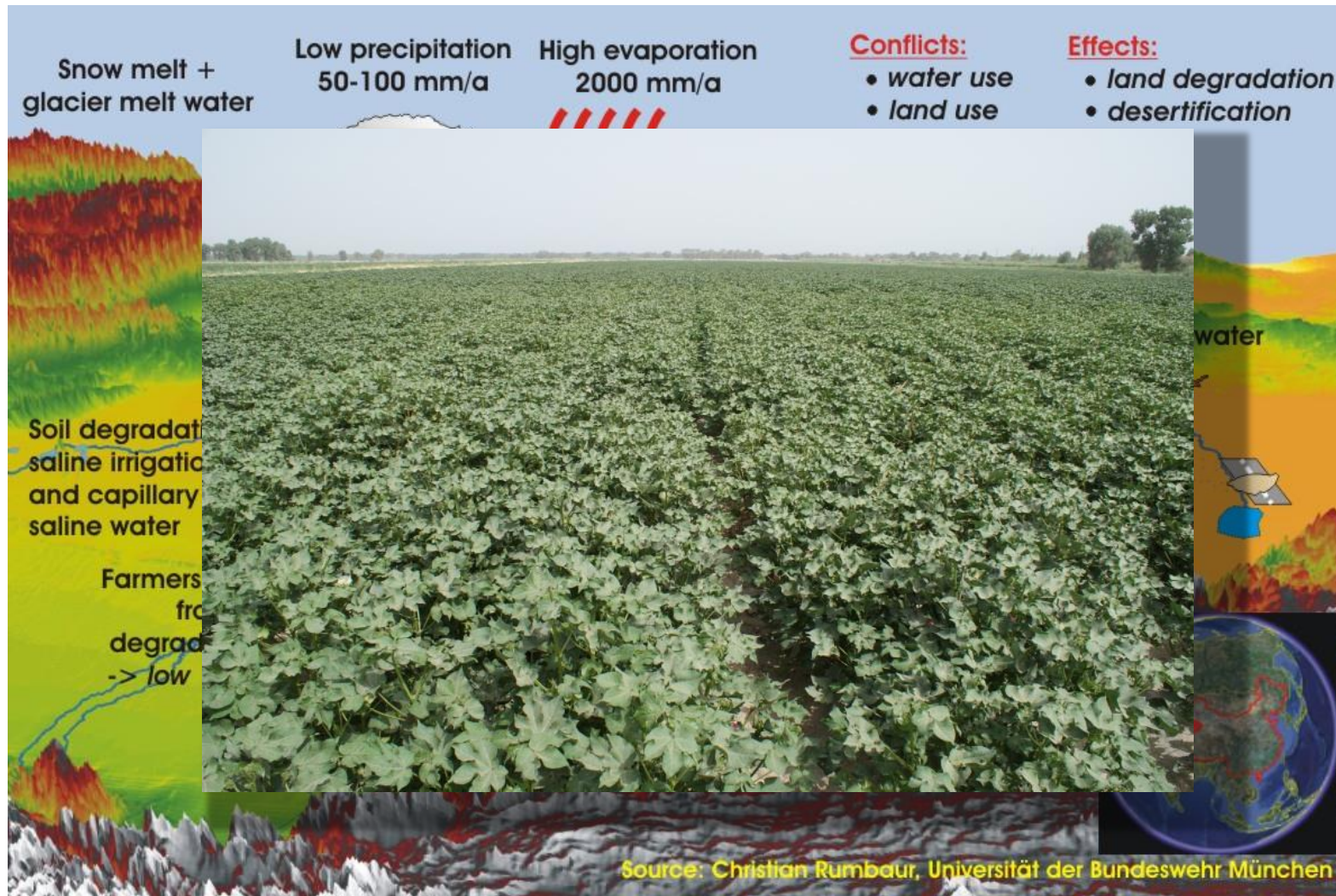


Outline

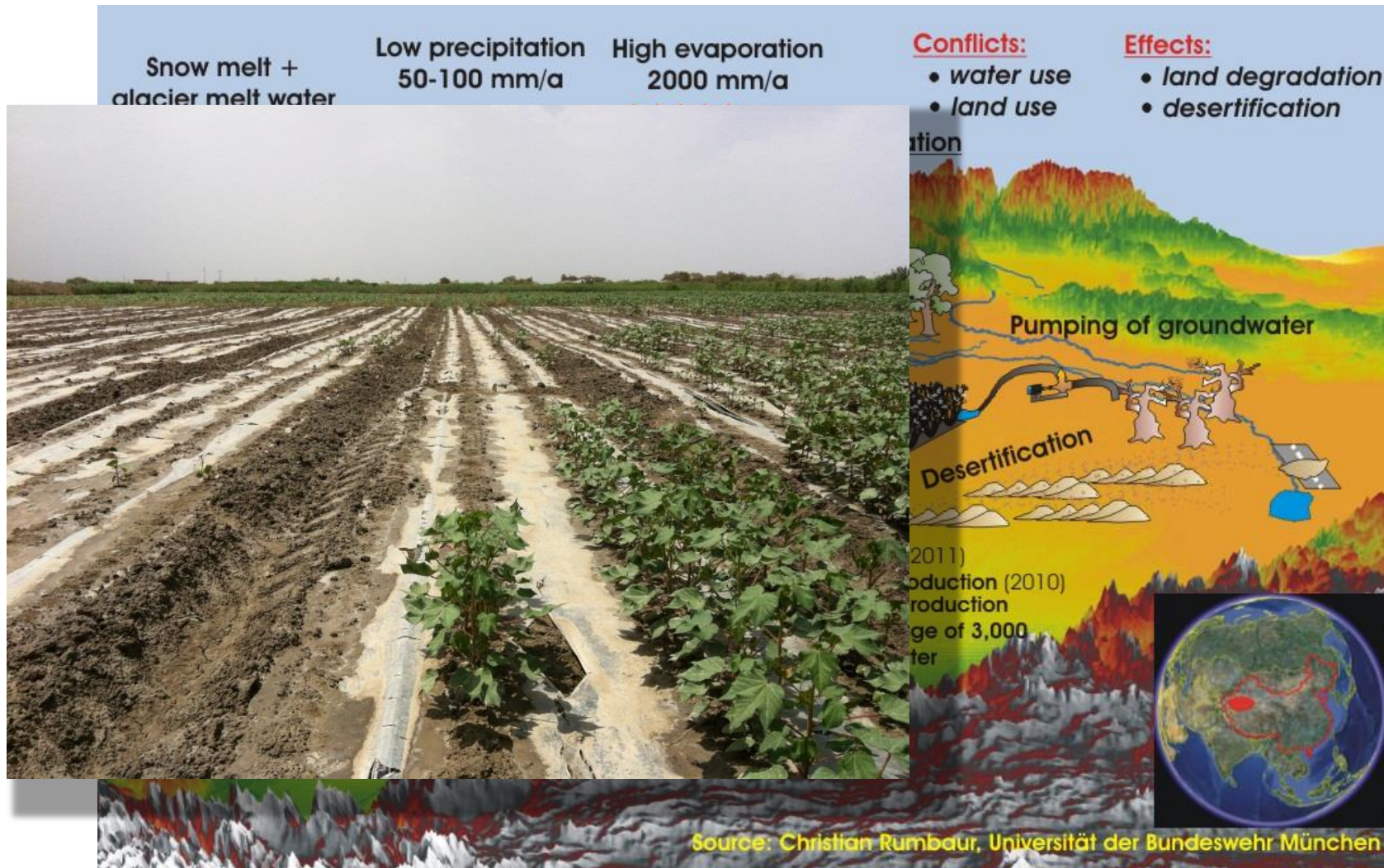


Source: Christian Rumbaur, Universität der Bundeswehr München

Outline of the regional problem



Outline of the regional problem



Outline of the regional problem

Snow melt +

Low precipitation
50-100 mm/a

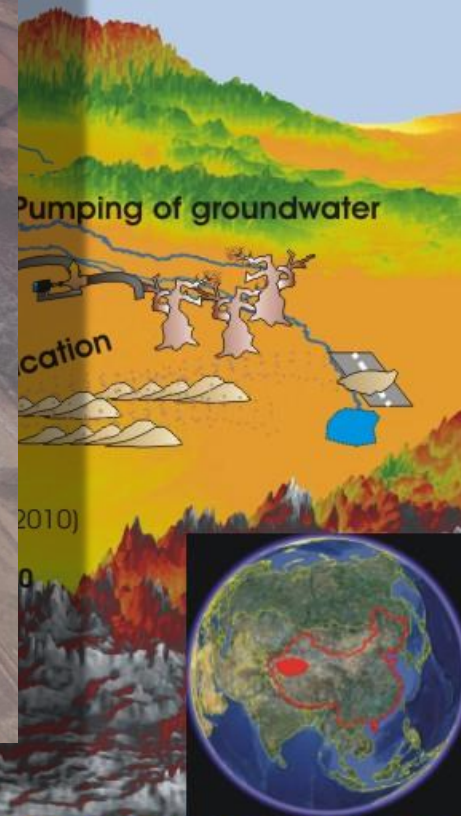
High evaporation
2000 mm/a

Conflicts:

- water use
- land use

Effects:

- land degradation
- desertification



Source: Christian Rumbaur, Universität der Bundeswehr München

Outline of the regional problem



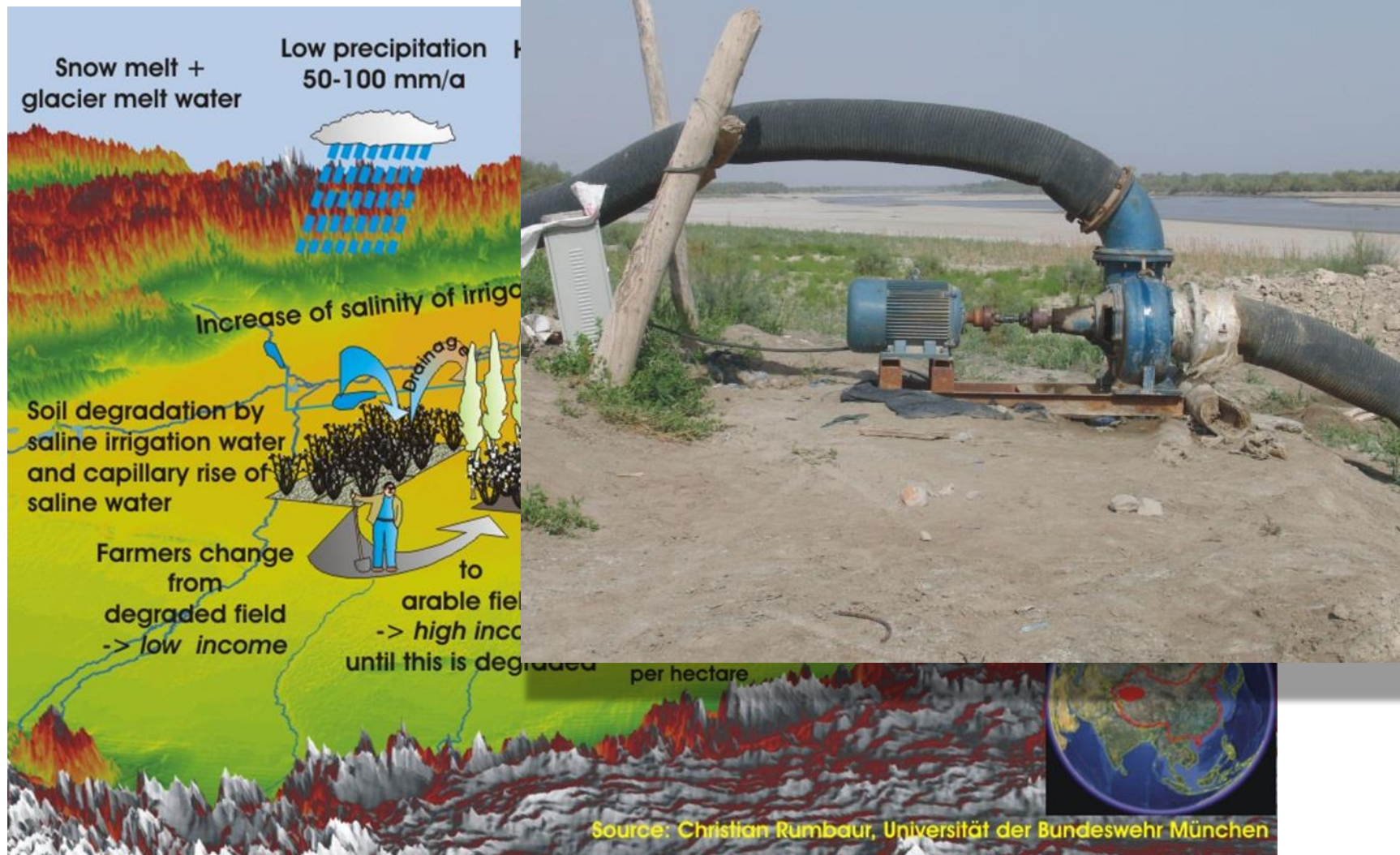
Effects:

- land degradation
- desertification



Source: Christian Rumbaur, Universität der Bundeswehr München

Outline of the regional problem



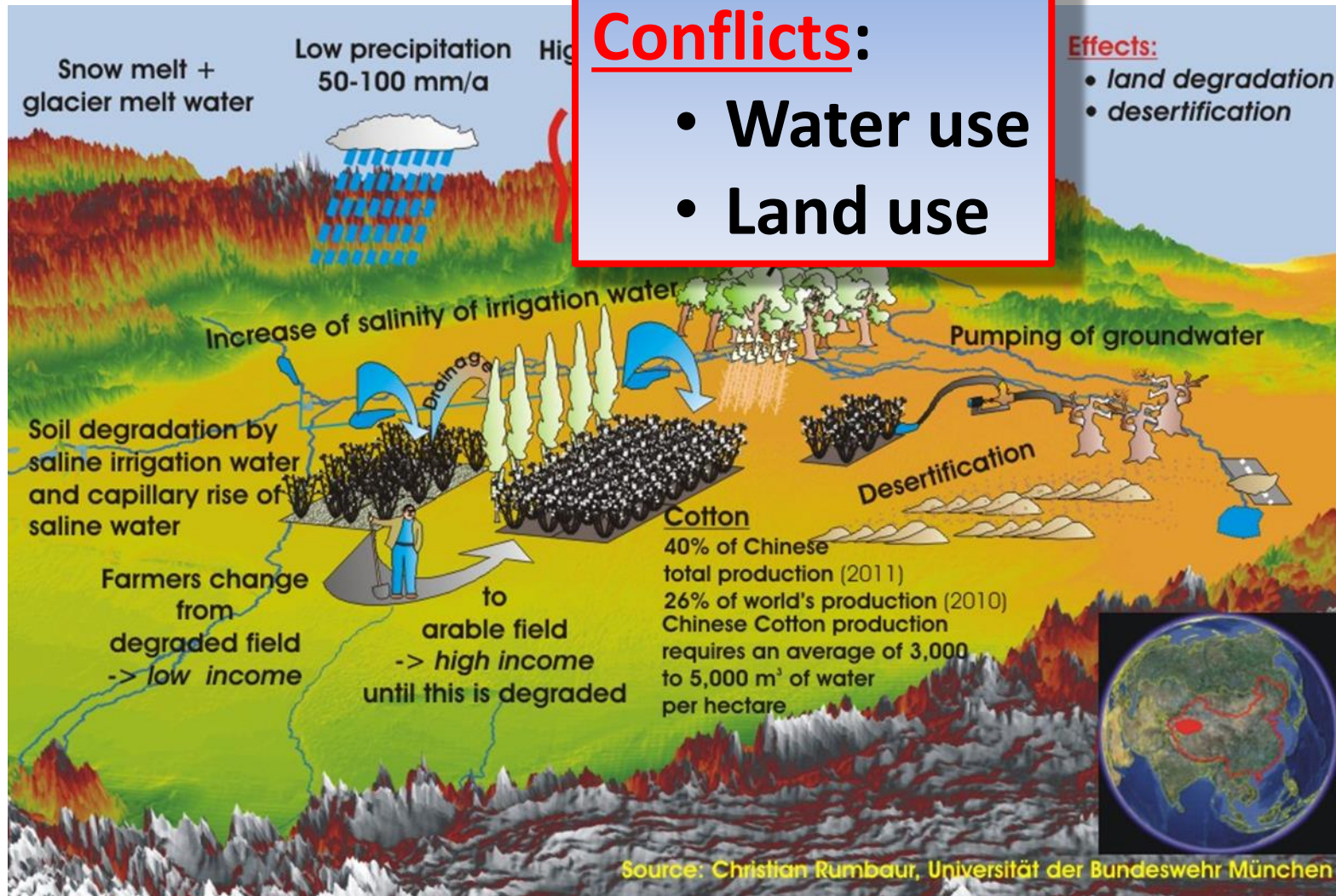
Outline of the regional problem

Conflicts:

- Water use
- Land use

Effects:

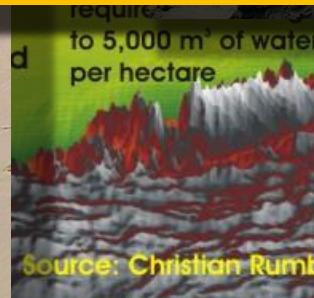
- land degradation
- desertification



Effects:

- Land degradation
- Desertification

The **question** is how to **manage land** use, i.e. irrigation agriculture and utilization of the **natural ecosystems**, and **water use** in a very water-scarce region, with changing water availability due to **climate change**, such that **ecosystem services** and **economic benefits** are maintained in the best balance for a **sustainable development**.



GLUES

Global Assessment of Land Use Dynamics on Greenhouse
Gas Emissions and Ecosystem Services

Project structure

WB 2: Regional Climate Change and Discharge of Tarim Tributaries

- WP 2.1: Monitoring and modeling of cryosphere
- WP 2.2: Regional climate scenarios and medium-term forecast of precipitation
- WP 2.3: Climate change impact on water discharge

WB 5: Multi-Level Socio-Economic Assessment of Ecosystem Services and Implementation Tools

- WP 5.1: Multi-level economic system assessment
- WP 5.2: Transdisciplinary assessment of ESS for urban areas regarding dust and heat stress
- WP 5.3: Actor-based decision support for land and water management

WB 1: Organization

- WP 1.1: Project coordination and equipment management
- WP 1.2: Scenario management
- WP 1.3: Stakeholder dialogue and coordination of knowledge transfer
- WP 1.4: GIS and DATA management

WB 3: Sustainable Water and Landuse Management in the Tarim Basin

- WP 3.1: Water requirement and water quality on the plot scale (0.1 km²)
- WP 3.2: Hydrology, salinity and biomass production on the local scale (10 km²)
- WP 3.3: Upscaling to the regional scale (200 km²)
- WP 3.4: Modeling of the water balance along the Tarim River (1000 km)

WB 4: Ecosystem services and Ecosystem functions along the Tarim River

- WP 4.1: Ecosystem services and Ecosystem functions of riparian ecosystems and aquatic biodiversity
- WP 4.2: Ecosystem services and Ecosystem functions of non-irrigated land use systems
- WP 4.3: Ecosystem services and Ecosystem functions of urban and peri-urban oasis vegetation

The diagram illustrates the Decision Support System (DSS) for Integrated River Basin Management. It shows the interaction between external scenarios, decision makers, and the internal components of the DSS.

External Scenarios: "Economy & Ecology" scenarios and "Climate & Hydrology" scenarios are linked by a double-headed arrow. Dashed blue arrows from both point to the "Alternatives" box, labeled "External scenarios".

Decision Maker / User: A yellow box on the left that interacts with the "Alternatives" box via a dashed orange arrow and receives feedback from the "Evaluation of alternatives" box via a dashed orange arrow.

Decision Support System (DSS) Components:


- Alternatives:** e.g. measures, options, combination of measures. Labeled "Integrated River Basin Management".
- Consequences / Effects:** Includes "Selection and weighting of problem-specific and crucial indicators" and "analysis of trade-offs and synergies". Labeled "Indicators system" and "Characterization of the project area".
- Evaluation of alternatives:** The final output of the DSS.

Flow arrows indicate the process: Alternatives lead to Consequences / Effects (dashed orange arrow), which leads to Evaluation of alternatives (solid orange arrow). A dashed blue arrow also points from Consequences / Effects back to Alternatives. A dashed blue arrow points from the Evaluation of alternatives back to the Decision maker / User.


- Influences
- Input / Output
- Decision process

SPONSORED BY THE

Targets of the UNCCD implemented by the project



Monitoring and Assessment



Capacity building and awareness-raising



Monitoring and Assessment



Capacity building and awareness-raising




Sustainable Land Management technologies




Knowledge management & decision support




Capacity building and awareness-raising




Participation, collaboration and networking



Knowledge management & decision support



Monitoring and Assessment



Capacity building and awareness-raising




Sustainable Land Management technologies



Monitoring and Assessment



Capacity building and awareness-raising



Sustainable Land Management technologies

Monitoring and assessment

Ecosystems:

- **Natural Forests and vegetation**
(Tugai vegetation)

- **Agricultural Land**

- **Urban and peri-urban vegetation**

Scenarios:

- ➔ Shallow to deep **groundwater level**
- ➔ Low to high **wood use** (pollarding)
- ➔ No to high **soil salinity**
- ➔ **Irrigation** method
- ➔ **alternative production systems** (Apocynum cotton)
- ➔ **Indigenous practices to modern city parks**



Aichi targets (CBD) implemented

WB 2: Regional Climate Change and Discharge of Tarim Tributaries



Ecosystem resilience

medium-term forecast of precipitation

WP 2.3: Climate change impact on water discharge



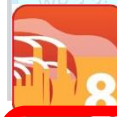
Sustainable consumption and production



Loss of habitats



Sustainable Agriculture and Forestry



Pollution



Essential Ecosystem Services

WB 1: Organization



Integration of biodiversity values



Biodiversity knowledge



Incentives



Sustainable consumption and production



Sustainable Agriculture and Forestry



Essential Ecosystem Services



Sustainable consumption and production



Loss of habitats



Protected Areas



Essential Ecosystem Services



Ecosystem resilience

Essential ecosystem services assessed

Provisioning services

water supply,
food and fodder,
fiber and raw material,
natural medicine

Regulating services

water purification,
soil fertility,
air quality,
local climate

Cultural services

recreation,
sense of place,
aesthetic appreciation,
scientific discovery

Supporting services

genetic resources,
biomass production,
nutrient cycling,
water cycling



Evaluation
of
**ecosystem
services**
related to
water and
health

Conclusions

The **SuMaRiO** project implements several targets of the Convention of Biodiversity (UNCBD) and the Convention to Combat Desertification (UNCCD).

By presenting SuMaRiO at the Conference of Parties of the UNCBD and the second scientific conference of the UNCCD the project is well recognized on a **high political level**

- by Chinese and German politicians
- Representatives of the conventions

SuMaRiO is embedded in the **global governance** process.

Thank you for your attention

