Co-Development of a Knowledge Portal to Utilize Multi-Model Based Information on Freshwater-Related Hazards of Climate Change

CO-MICC

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Objective

The integration of climate service information in decision-making processes related to climate change (CC) impacts is increasingly important. However, there is a lack of studies on **how to integrate global-scale multi-model ensemble (MME)** information into water-related CC adaptation measures in a participatory manner.

The ***CO-MICC project*** addresses these gaps by **co-developing a knowledge platform** with **stakeholders.**
The project aims at enabling users around the world to freely access relevant MME information for the **assessment of freshwater-related CC hazards including uncertainties**.

Approach:

Co-Development & Stakeholder Dialogue (Fig. 2):

- Interviews and workshops in focus regions to gain experience & input from experts to implement appropriate products like interactive maps or suitable visualization tools for uncertainty

The knowledge portal will contain:

- Information about the modelling process & indicator selection
- The data viewer & analysis tools
- User Stories & tutorials

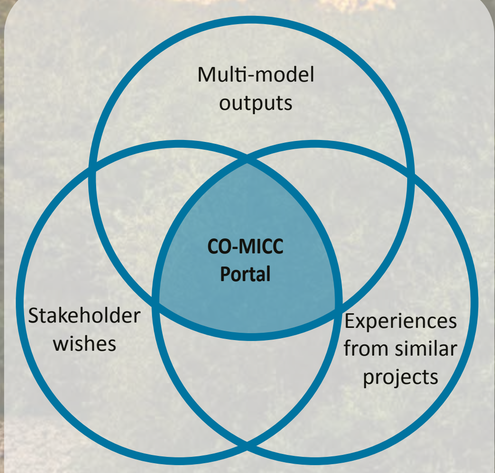
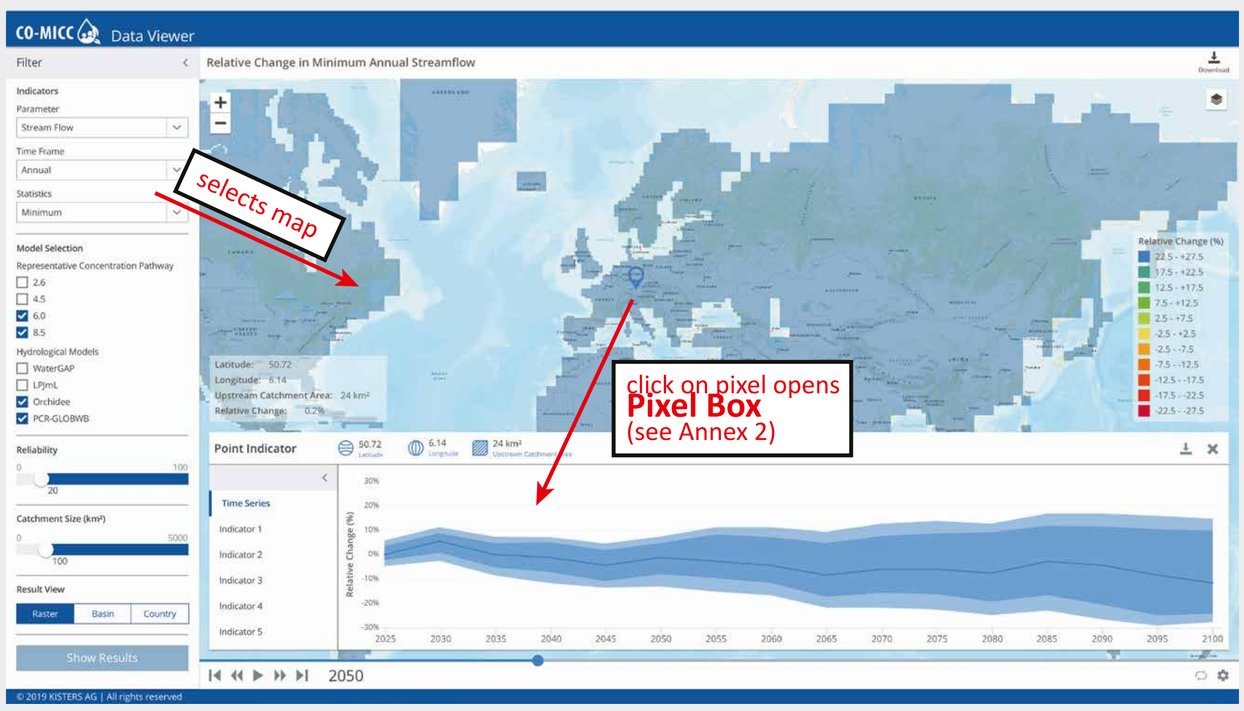


Fig. 2: Schematic of aspects in co-development

Results:

www.co-micc.eu

Fig. 1: Overview of Data Portal (in development)



Annex 1: Map display

Reliability estimate for the future projections on global scale and for diverse MME members becomes complex quickly
⇒ Suitable and simple: Agreement on sign of change (see Fig. 1, Options)

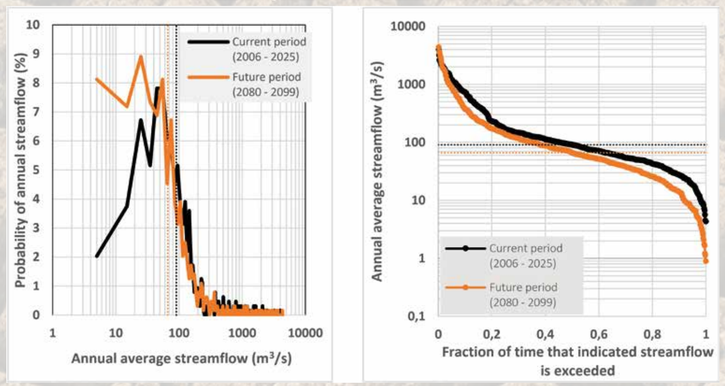
Tab. 1: Indicator List

Blue water production (i.e., Total Runoff)
Streamflow
Naturalized streamflow
PET
AET
AET/PET
Groundwater recharge
Soil moisture
Snow storage
Net irrigation requirement
Temperature
Precipitation

Annex 2: Pixel Box

- Tools:
  - time series & box plots for comparisons
  - flow duration curves
  - probability distributions
- Discrepancy: Planification based on single number vs. MME information.
- Cumulative distribution functions (CDF) such as flow duration curves preferred over probability density functions (PDF), see Fig. 3.

Fig. 3: PDF and CDF of annual streamflow at Moulouya-Darel station, Morocco



(A) Indicators:

- Elucidated interest in hydrological variables, specific diagnostics, and time scales:
  - Indicators solicited from Stakeholder Dialog feedback (Tab.1)
  - Resulting time scale ranks: 1) monthly, 2) daily, 3) annual, 4) seasonal

(B) Integration of Uncertainty:

Map Display:
- Slider for reliability (see Annex 1)

The Pixel Box:
- Analysis tools that are understandable & scientifically correct (see Annex 2)
- Incorporating full uncertainty information

(C) Explanations on the Portal (Knowledge Portal):

- Stakeholder Dialog found that data presented in the way of previous portals remains unclear with respect to the specification of the presented indicator.
  ⇒ Potential misinterpretation of data.
  ⇒ Meaning and calculation basis ofindicator selections and presented data must be communicated in a transparent and understandable way!

Conclusions

1. **Iterative dialog process** supports the co-development. Positive feedback by experts.
2. To cover a wide range of potential users, **differentiation** between those with specific knowledge & laymen should reflect in the user interface.
3. Supplements on the portal must **leave no doubt** regarding the meaning of indicators, be transparent in the **calculation basis**, and elucidate the **associated uncertainties**.
4. To increase user acceptance **language barriers and political boundary dissents** will be taken into consideration.

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GOETHE UNIVERSITÄT FRANKFURT AM MAIN
KISTERS

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