The European Commission's science and knowledge service

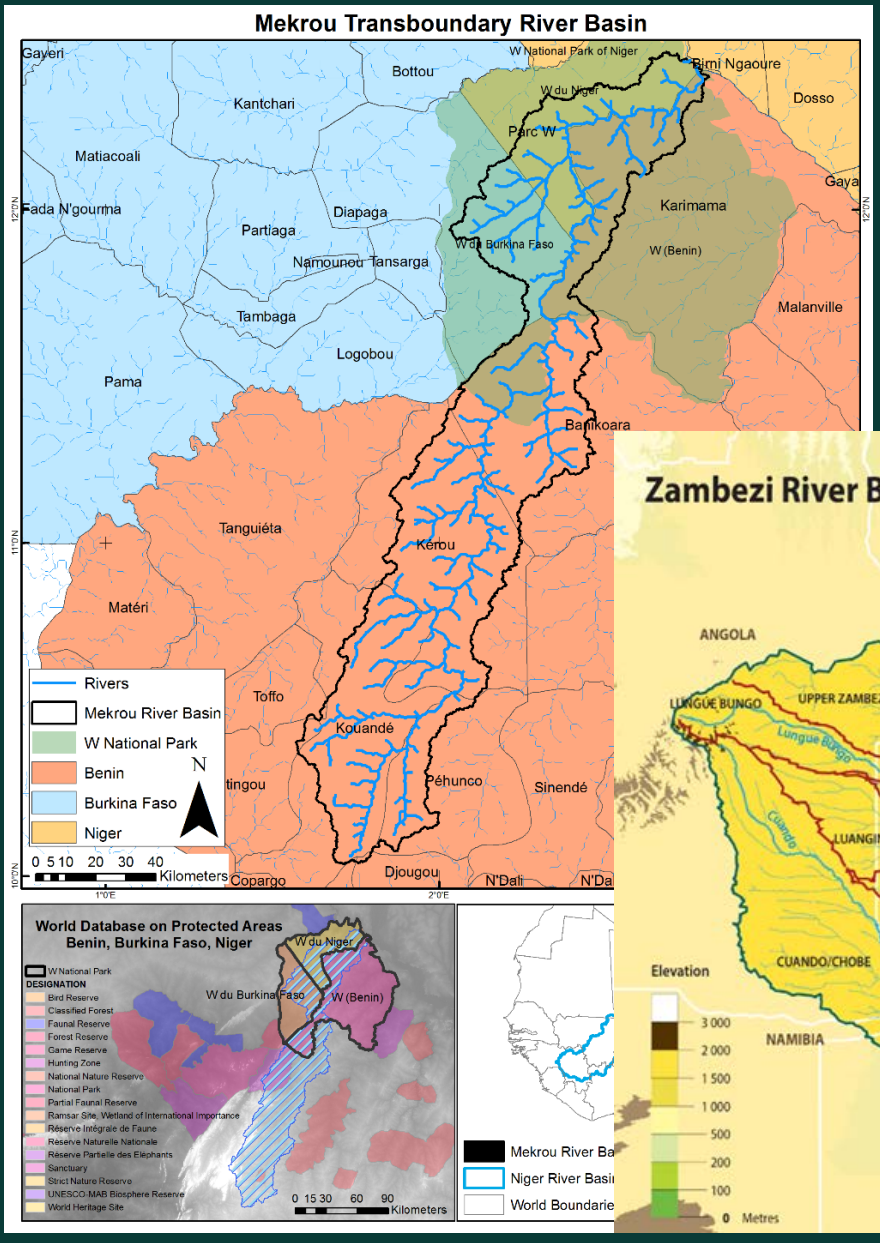
Joint Research Centre

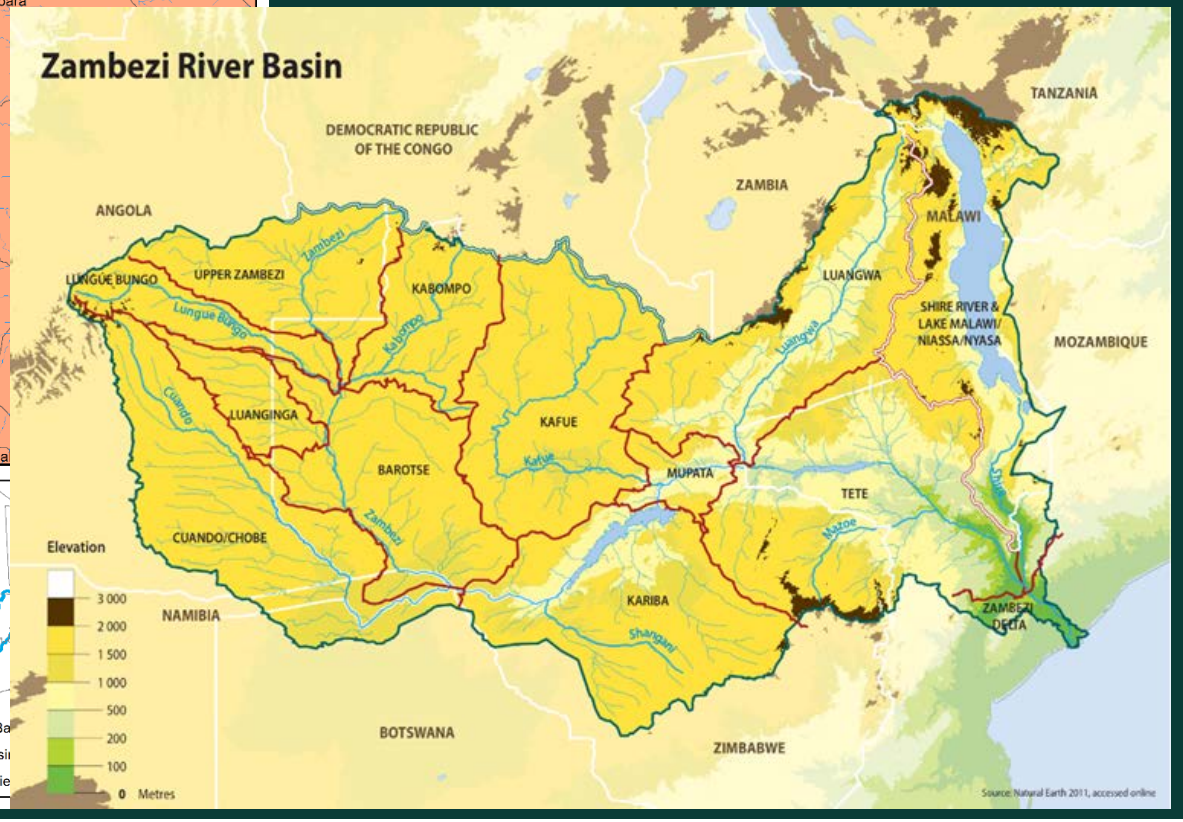
Paolo Ronco (JRC.D02)

Joint Research Centre

UNECE NEXUS task force meeting, Geneva, 18/10/2017

ASSESSING WEFE NEXUS IN AFRICA: tools, projects, perspectives





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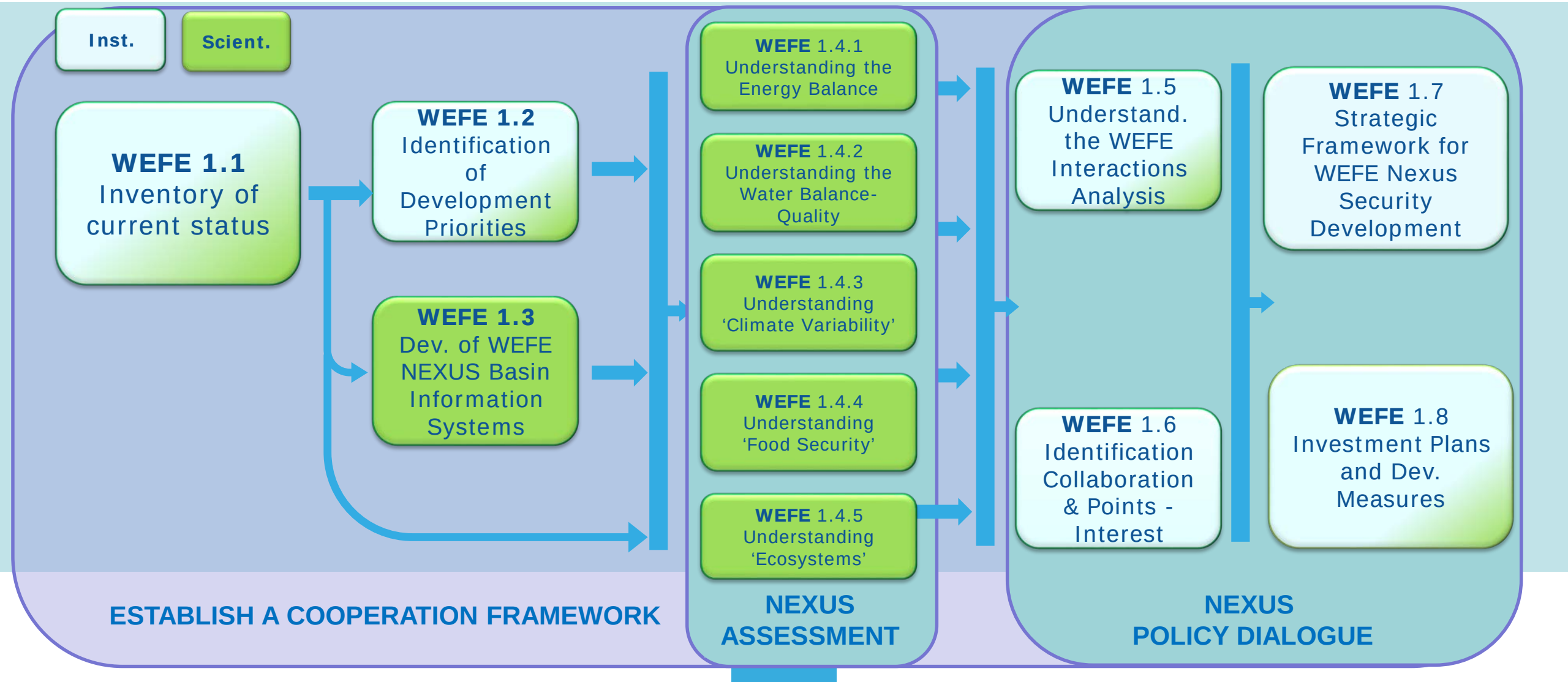
Water Resources Unit

European Commission

Joint Research Centre

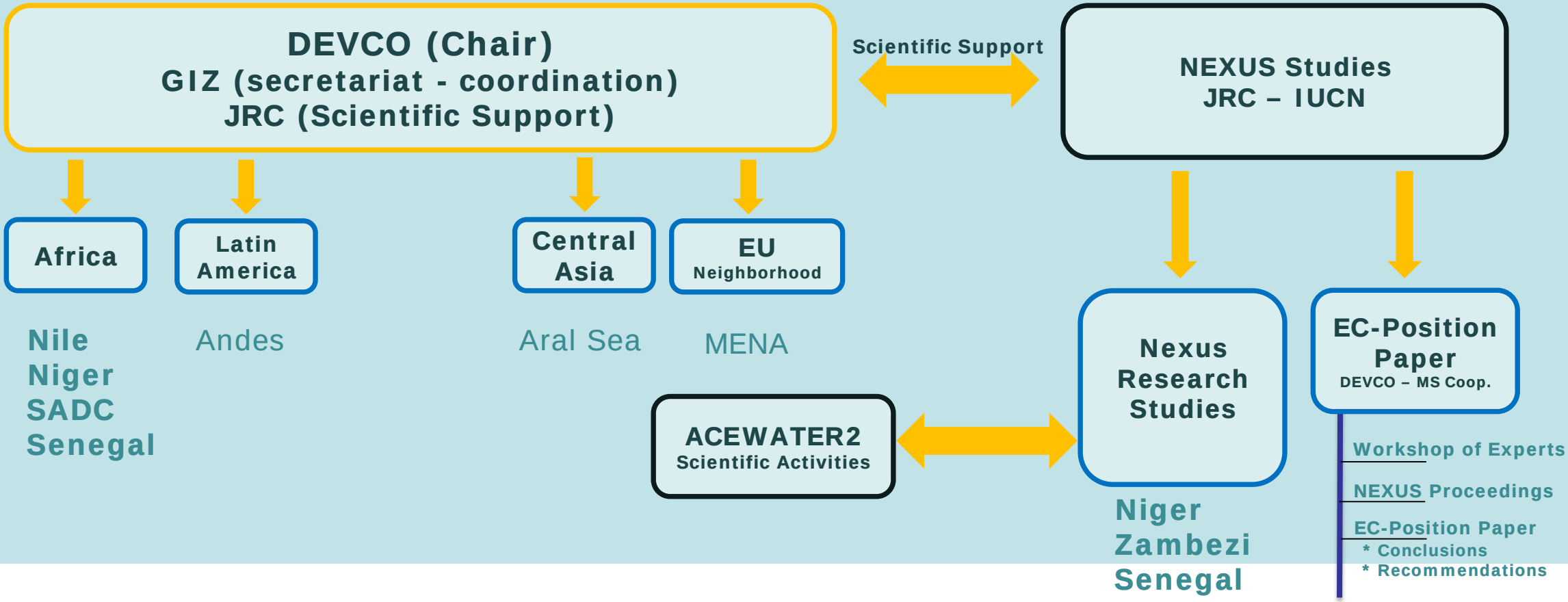
UNECE NEXUS task force meeting,
Geneva, 18/10/2017

WEFE Nexus methodological approach: establishing effective Cooperation Framework



EC Nexus Dialogues Programme

Project Organization



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EC Nexus Dialogues Programme

OUTLINE of the EC POSITION PAPER

OBJECTIVE: provide recommendations to DEVCO and cooperation agencies of Members States on priorities and needs in WEFE Nexus.

1. Applying WEF Nexus in policy and practice: guidelines and challenges based on Nexus experiences
   1.1 WEF NEXUS Governance and Cooperation Frameworks
   1.2 Data, Models and Tools assessing WEF Nexus
   1.3 Sustainable Technological Approaches and Solutions: Facilitating the most appropriate technologies in various scales
   1.4 Nexus financing and feasibility

2. Study Findings and Recommendations, opportunities and the Way Forward

CONTRIBUTORS of the EC Nexus POSITION PAPER

1. JRC
2. IUCN UNESCO-IHP
3. Texas A&M University
4. American University of Beirut
5. FAO (TBC)
6. Central Asia University
7. MEDRC Water Research Oman
8. SIWI
9. WORLD BANK (TBC)
10. Arabian Gulf University (AGU)
11. GIZ
12. CEPAL
13. GWP
14. IIASA
15. UNU FLORES
16. UNECE (TBC)

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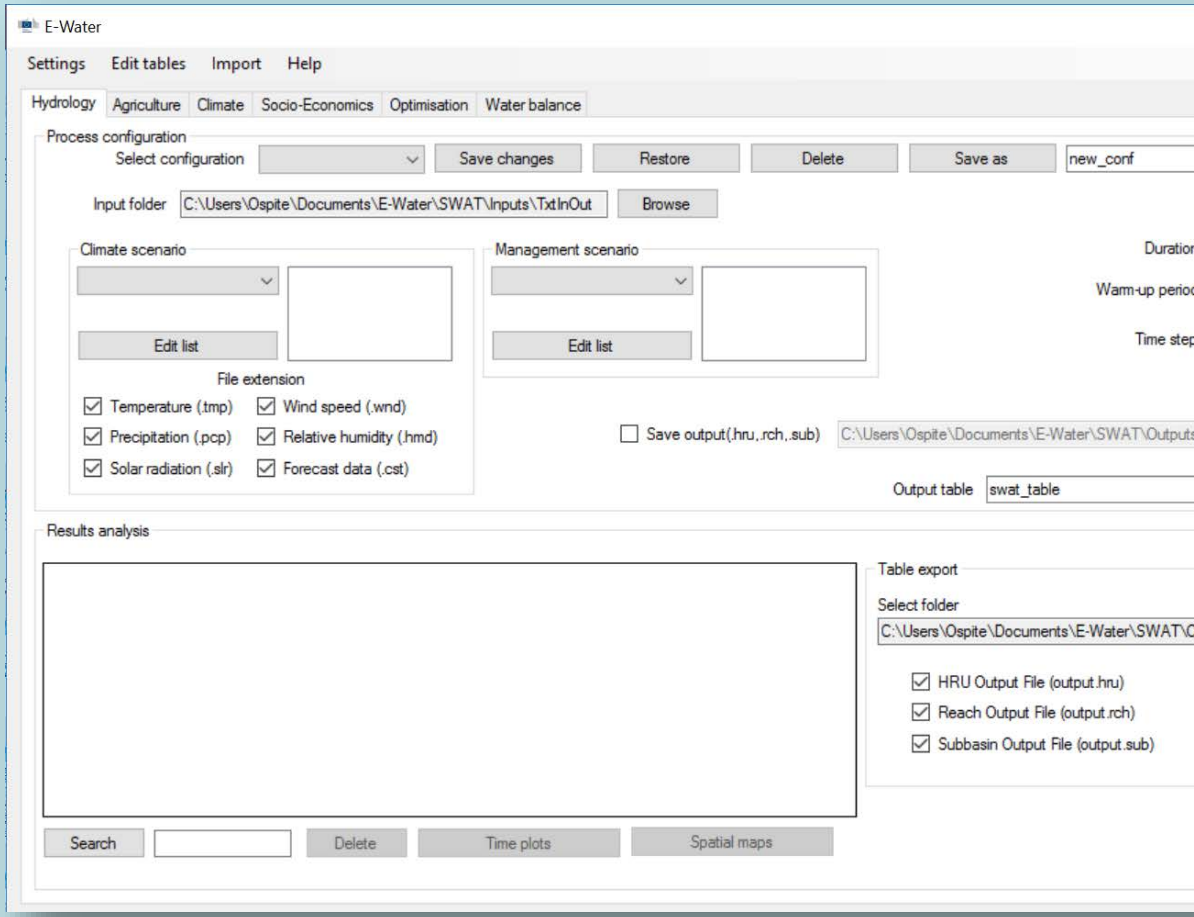
e-NEXUS Decision Support Tool assessing WEFE Nexus features

1. Generation of optimal scenarios to **support RB Policy Makers** with the preparation of the **Strategic Development and Investment Plans**
2. Developed with technical services and Universities of **Benin, Burkina Faso and Niger**
3. Flexible user (friendly) **interface**
4. **Thematic layers** with robust modelling of
   - Hydrology
   - Agriculture
   - Climate
   - Water Balance
   - Socio-Economic
4. Optimization based on **Multi-Criteria Decision Analysis** (MCDA) to scenario based Water Balance



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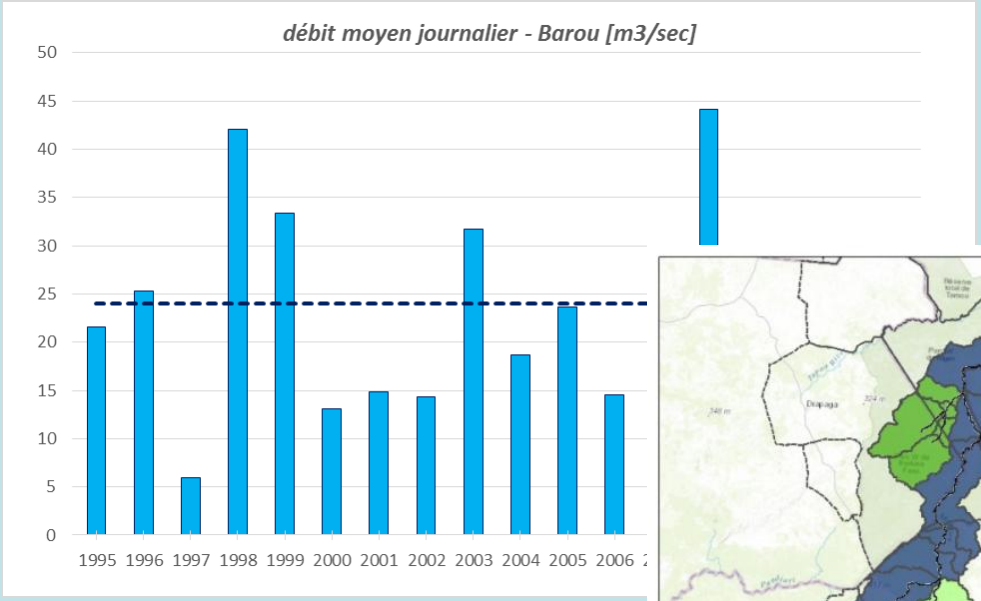
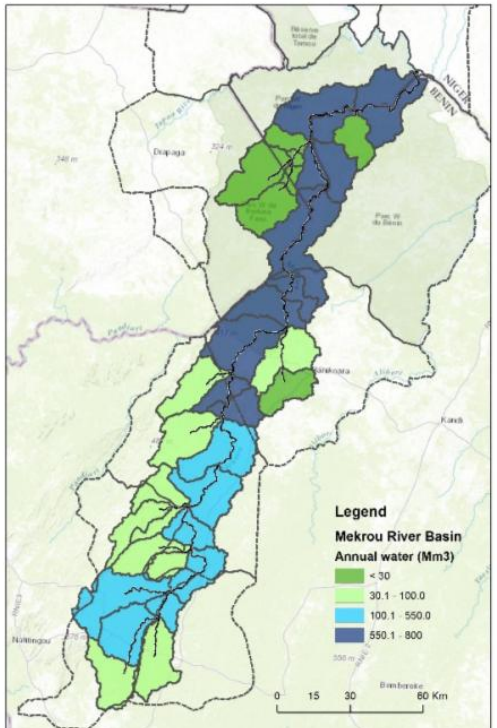
e-NEXUS Decision Support Tool
understanding and simulating future Water Balance

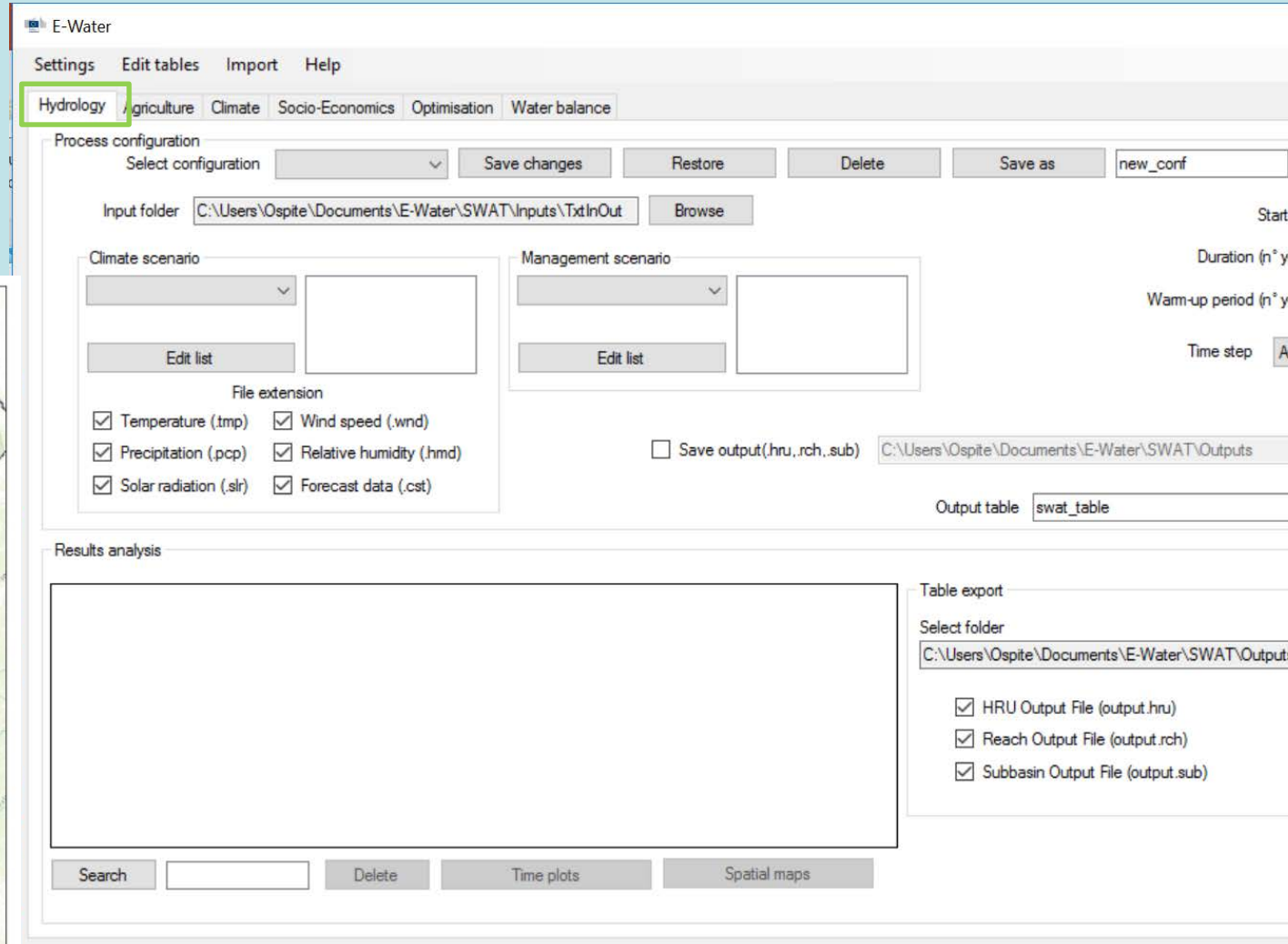
HYDROLOGY LAYER: develop scenarios of Water Demand vs Availability according to the different competitive uses (SWAT based)



Simulation of mean discharge (m3/sec) 1995-2012 (SWAT)

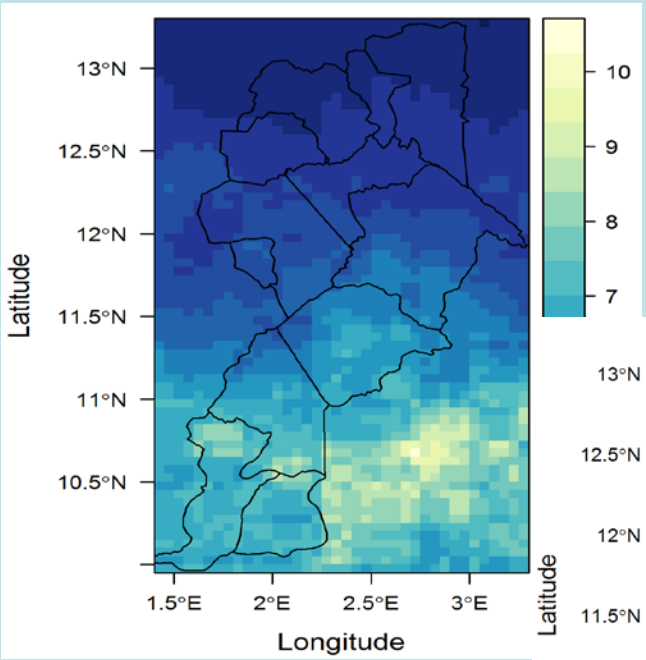


Annual Discharge (Mm^3) in different sub basins of Mékrou (ref 1995-2012)

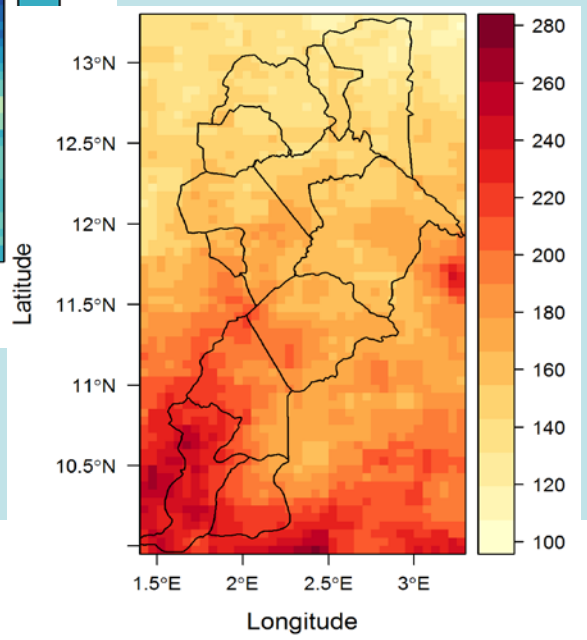


e-NEXUS Decision Support Tool
impact of climate variability

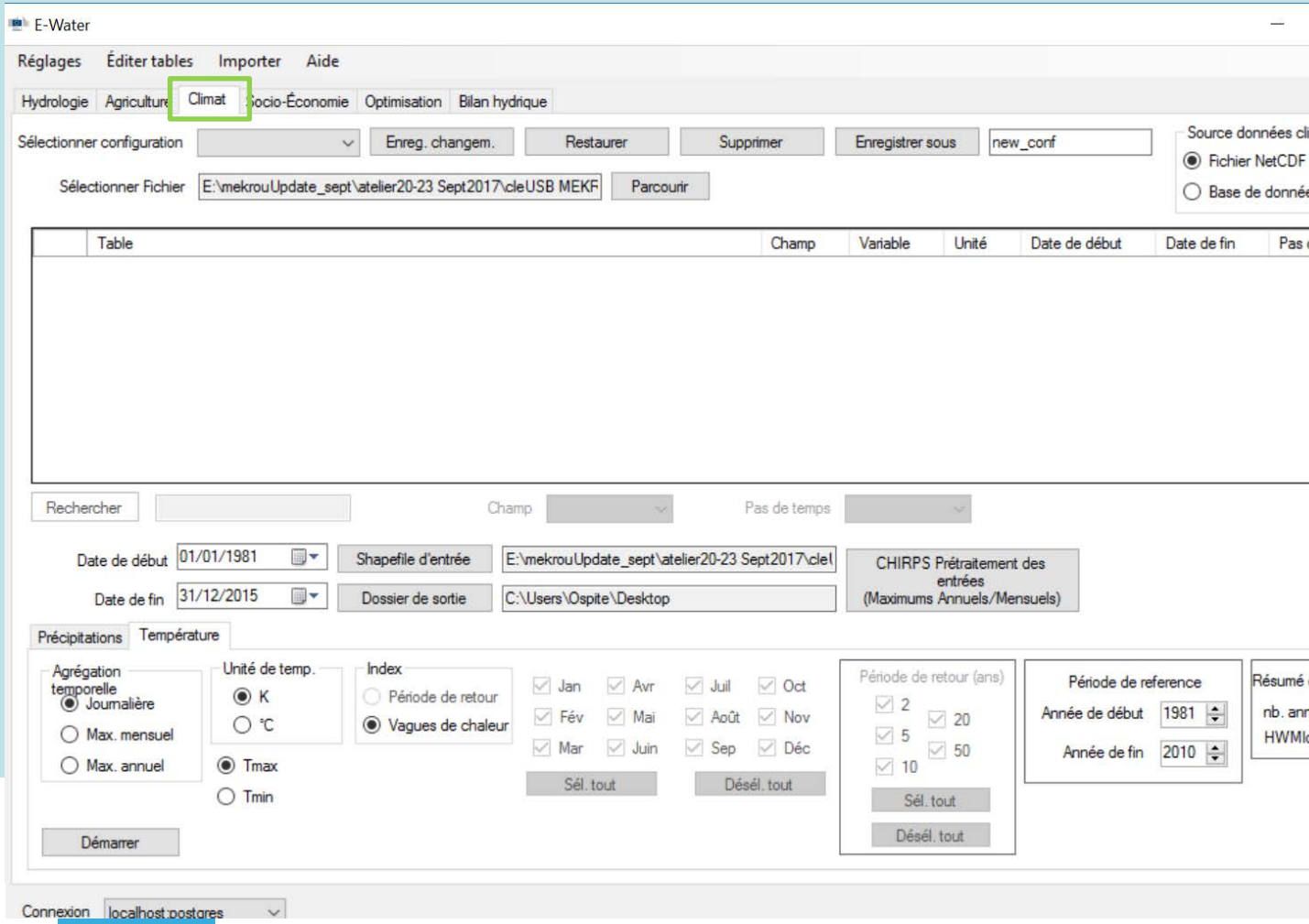
CLIMATE LAYER: Analyzing the recurrence of extreme events (precipitations/heat waves…)



RP Precipitation excess of +30% (years)

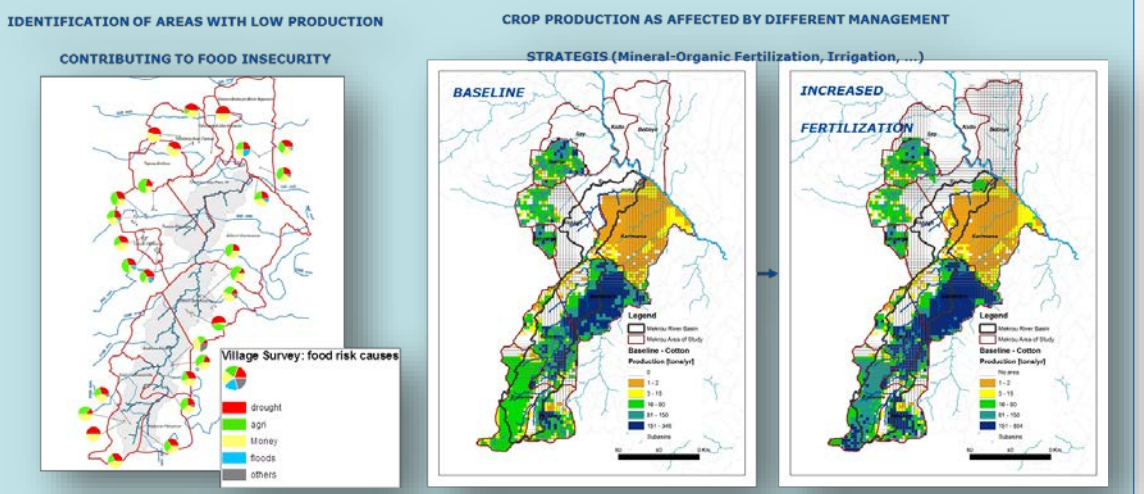


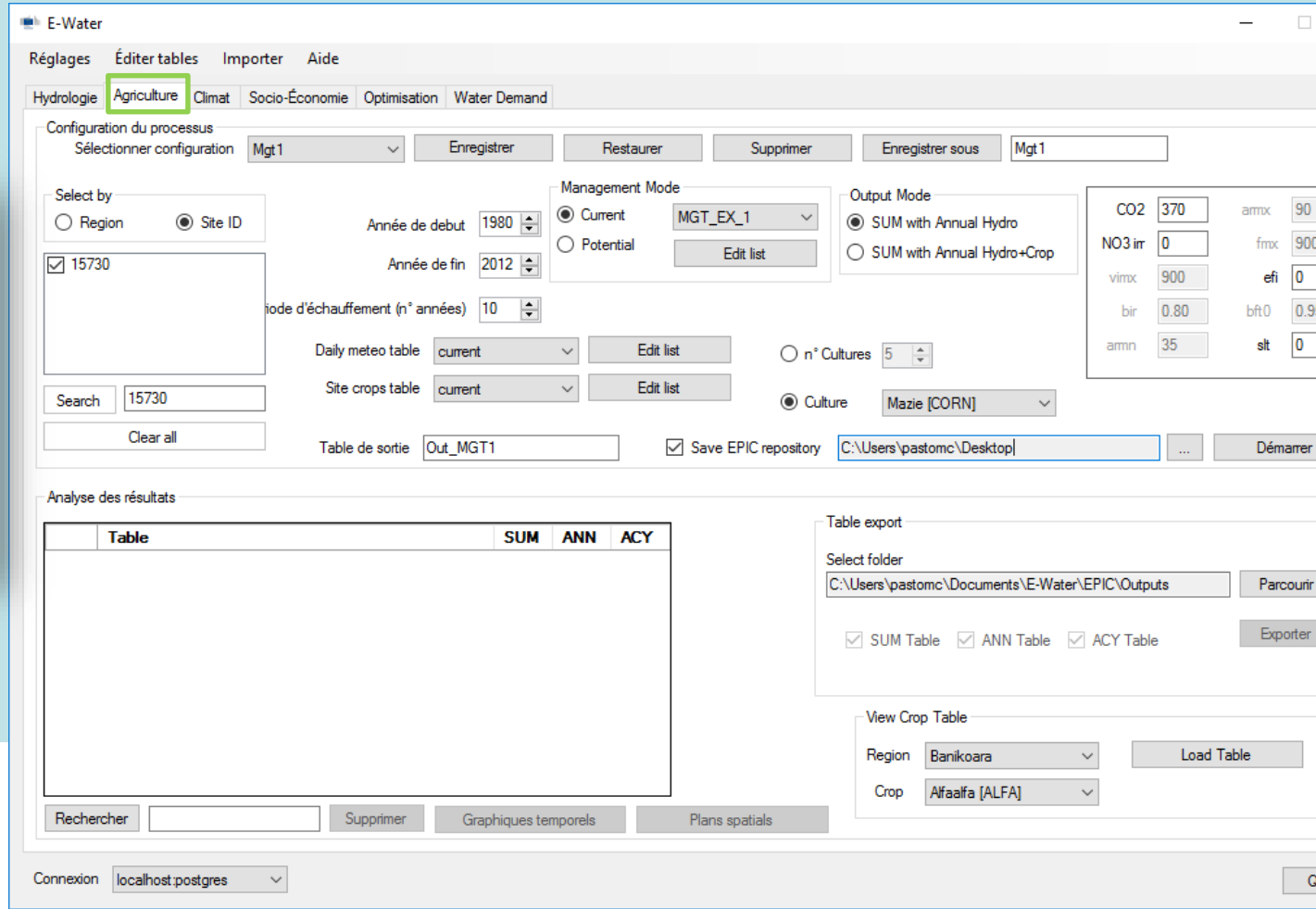
Precipitation deficit for a 20 RP (mm)



e-NEXUS Decision Support Tool
building scenarios on agricultural production according to objectives, climate pattern and management practices

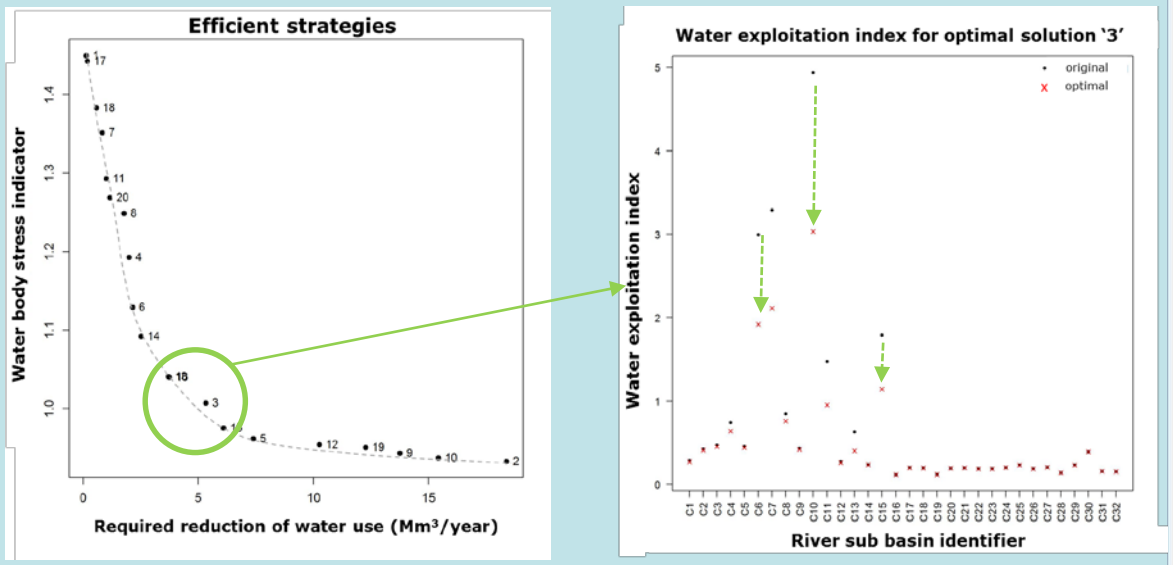
AGRICULTURE LAYER: developing scenarios on agricultural/livestock production and related needs (water, nutriments, practices…) with EPIC and Climatic Scenarios CORDEX



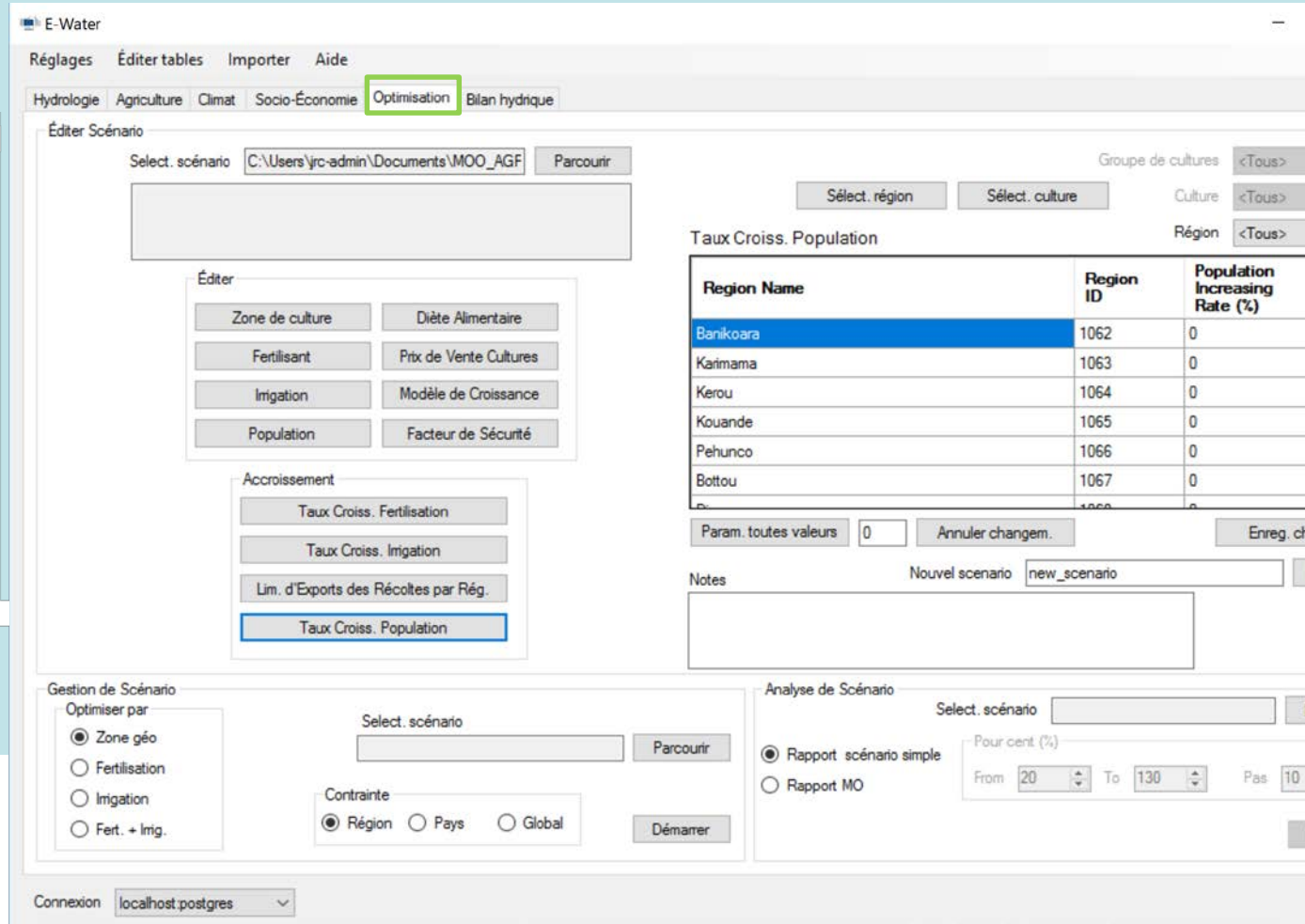


e-NEXUS Decision Support Tool
Multi-Objective Optimization to develop alternative scenario on water resources management

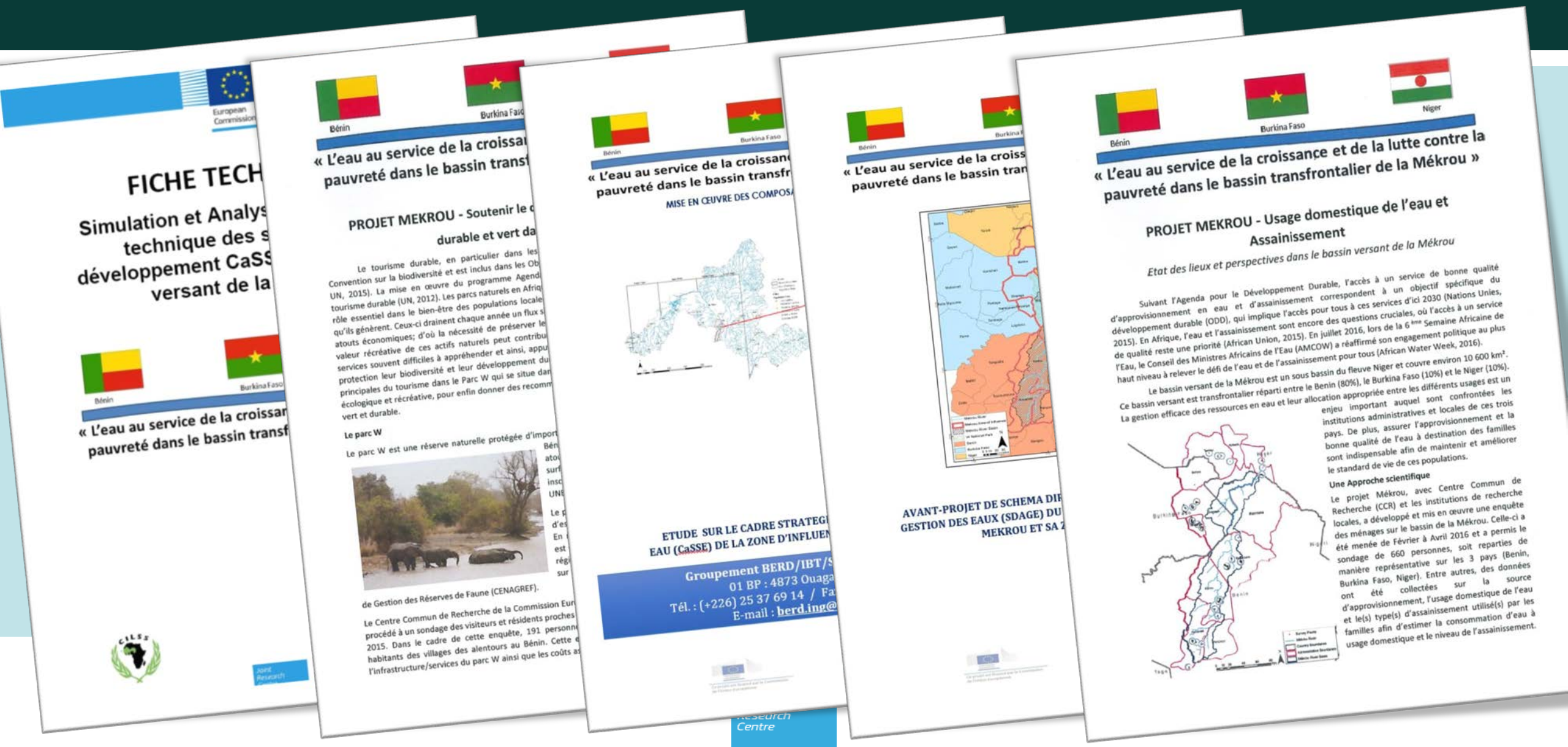
OPTIMIZATION LAYER: Finding multiple optimal solutions considering several objectives: food security, reduction of water resources demands, farmers economic benefit, crop surface allocation, optimal fertilization



Identification of optimal solutions according to set



e-NEXUS Decision Support Tool OUTCOMES
strategic development plans at river basin scale

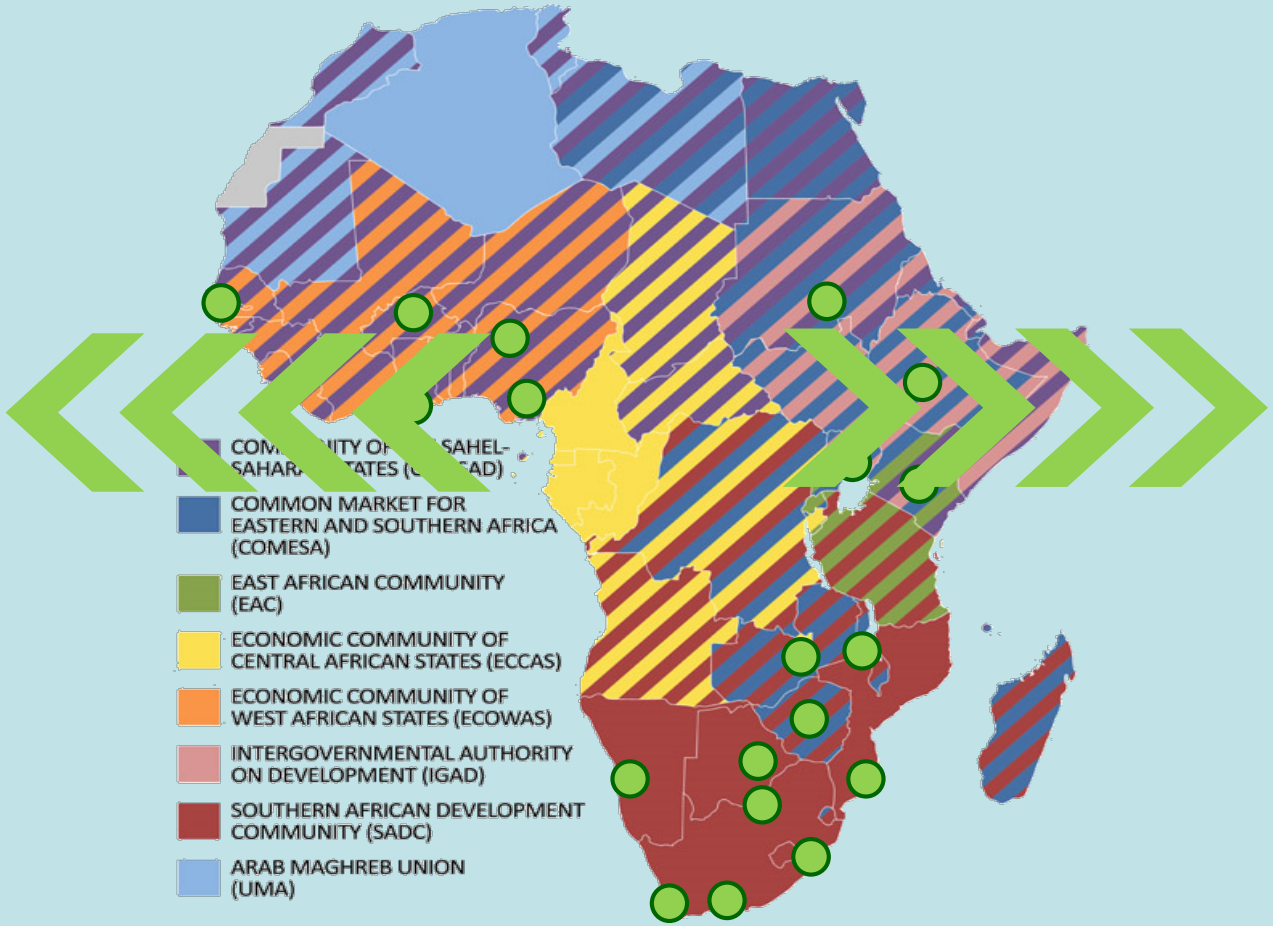


AU-NEPAD African Networks of Centers of Excellence on Water
Dynamic of the science – policy dialogue

Scientific level

Centers of Excellence

1. Development of Scientific knowledge, expertise and (demand-driven) tools
2. Support to capacity building and skills development in the water sector



Policy level

RECs
RBOs
Nationals

1. Identification of needs and priorities
2. Development of (sustainable) strategies and policies
3. Regional Exchange

Centers of Excellence Network is a platform for regional dialogue and collaboration with policy representatives

AU-NEPAD African Networks of Centers of Excellence on Water addressing the WEFE nexus assessment in large river basins

Western African CoE Network

1. University of Cheikh Anta Diop (Senegal)- Coordinator
2. International Institute for Water and Environmental Engineering (Burkina Faso)
3. University of Benin (Nigeria)
4. National Water Resources Institute (Nigeria)
5. Kwame Nkrumah University for Sciences and Technology (Ghana)

NIGER SENEGAL

Southern African CoE Network

6. Stellenbosch University (South Africa) – Coordinator
7. International Centre for Water Economics and Governance in Africa (Mozambique)
8. University of KwaZulu-Natal (South Africa)
9. University of Western Cape (South Africa)
10. University of Malawi
11. University of Zambia
12. University of Botswana
13. The Council for Scientific and Industrial Research, CSIR (South Africa)
14. Namibia University of S&T
15. National University of S&T (Zimbabwe)
16. University of Mauritius

ZAMBEZI

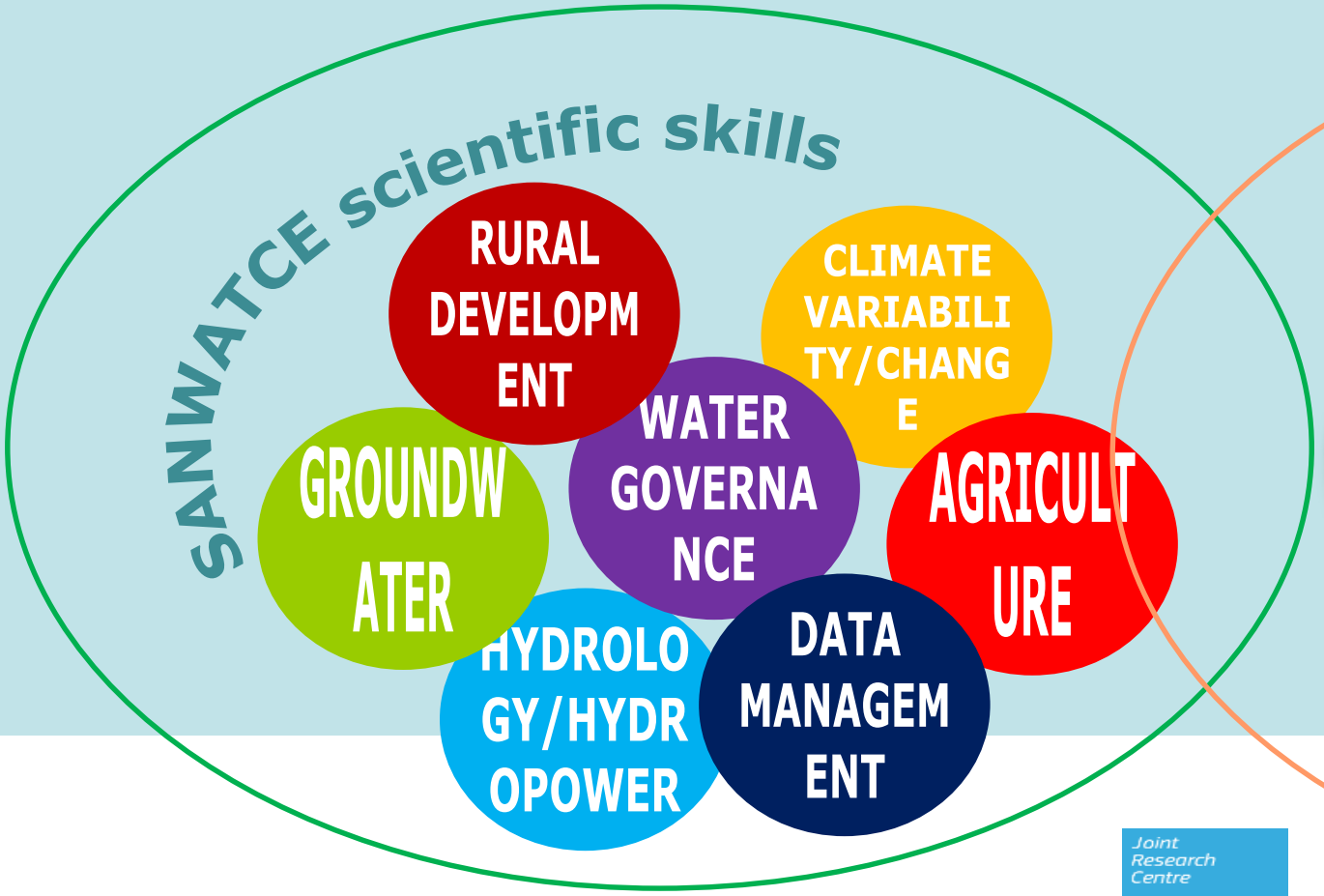
Eastern and Central Africa CoE Network (since aug.2017)

17. Makerere University (Uganda)
18. Water Research Center, University of Khartoum (Sudan)
19. Ethiopian Institute of Water Resources, Addis Ababa University (Ethiopia)
20. IGAD Climate Prediction and Applications Centre (Kenya)

Southern African CoE Network - SANWATCE

Water and Cooperation within the Zambezi River Basin (WACOZA)

METHOD: identification of priorities, needs, and consequent specific objectives and activities have been performed taking into account:



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Thanks

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