# From Fragility to Resilience in Central and West Asia and North Africa (F2R-CWANA)

## WP 4: Integrated food, land, water and energy systems for climate resilient landscapes

**Inception Workshop – Morocco May 17, 2022**


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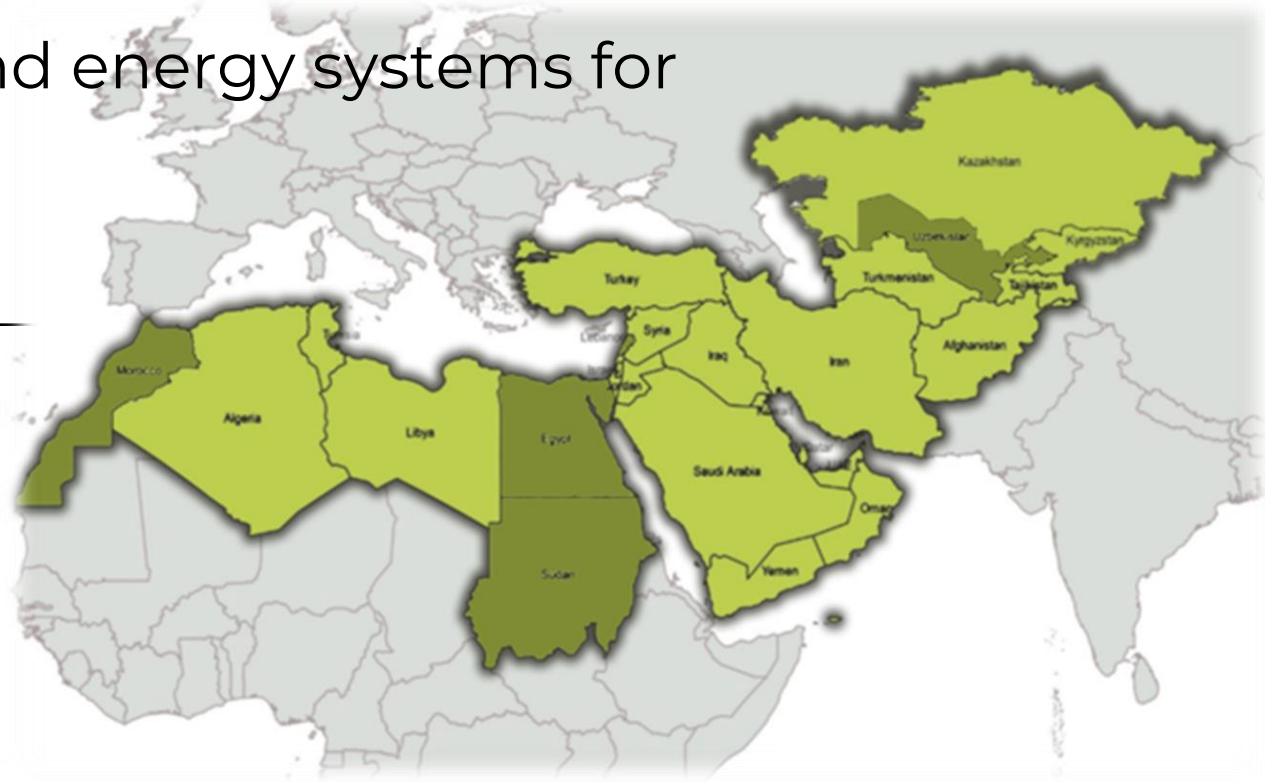
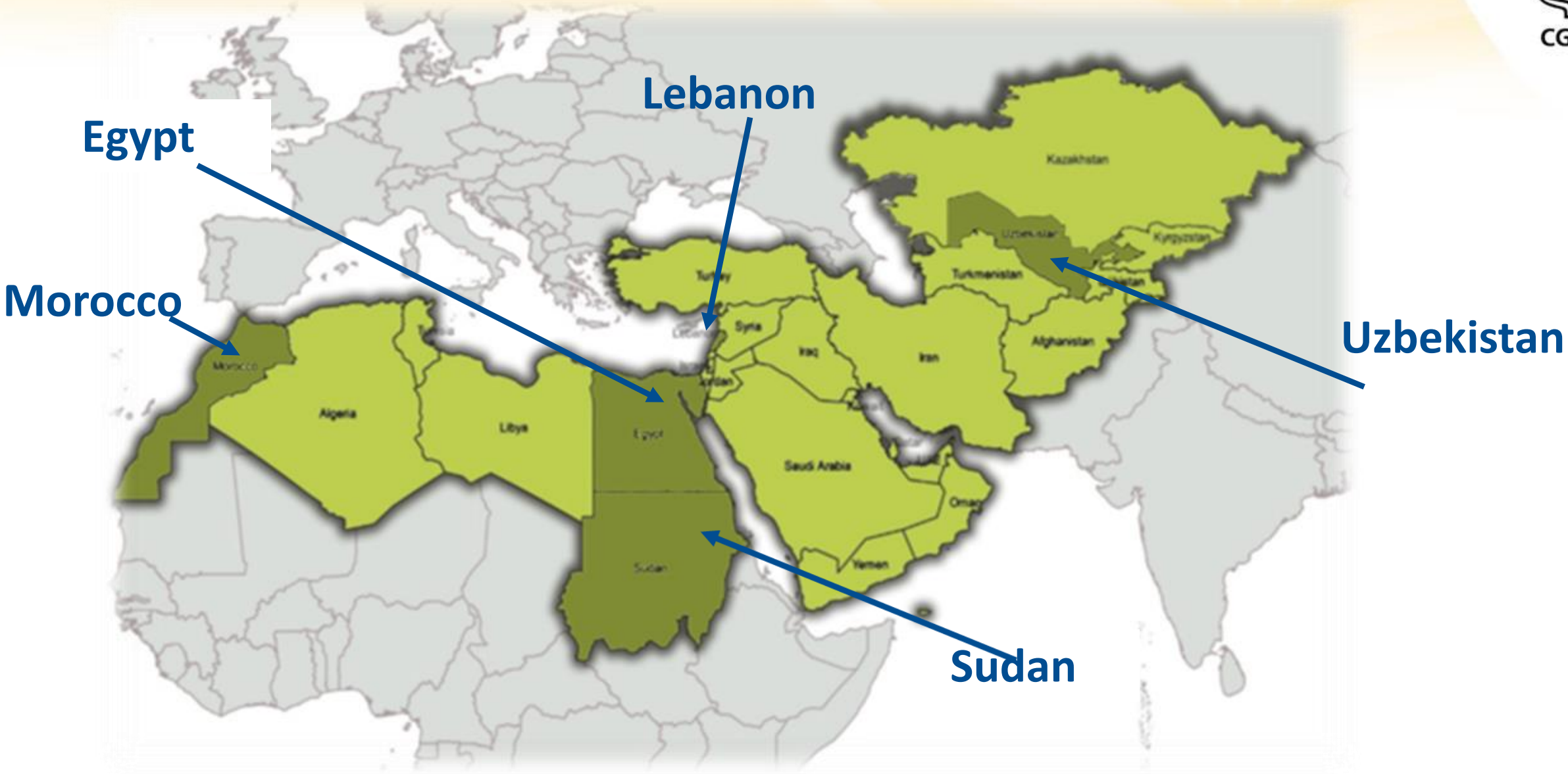


# WP4 geographic scope



# Challenges WP4 intend to address in CWANA region


Drought and heat

Population growth

Limited water for agriculture

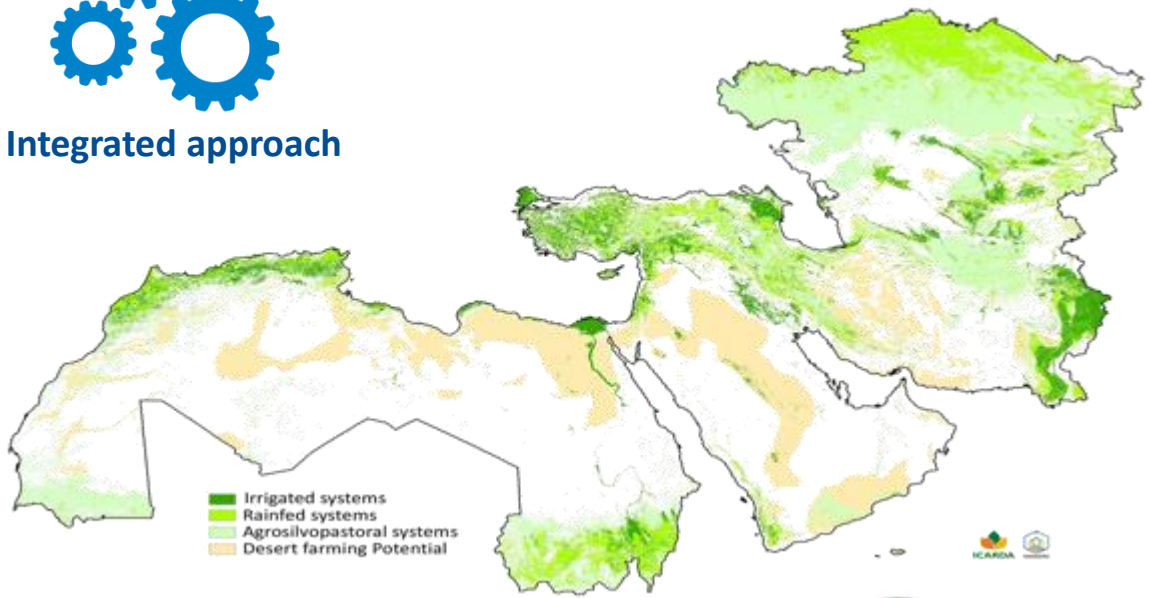
Weak governance, fragility and conflicts

Gender Inequalities

## Fragility

Integrated approach

## Resilience




Robust regulation and governance systems to enable success

Limit of growth

Improve water use and salinization

# WP4: Main Focus and Activities

Support communities and stakeholders for more **sustainable, resilient and inclusive water, energy and landscape management policies, design and practices** at the regional, national and landscape scales.

- **Diagnostics to clarify limits to growth and improve the long-term potential for sustainable livelihood**
- **Foundations for scaling up access to alternative water resources, including water recycling and re-use**
- **Integrated approaches to storing more water in natural and built systems at multiple scales, and increasing the productivity and value of that water**
- **Maintaining productivity in saline landscapes**
- **Strengthening inclusive policies and governance for integrated management across the food-land-water-energy nexus**

# WP4 Research questions- scientific methods

## Research question 1: What is the current and long-term potential and extent for sustainable livelihoods at the landscape scale (basin and country) within a climate change context?

**Diagnostics to clarify limits to growth and improve the long-term potential for sustainable livelihoods**

**Natural resource mapping and analysis largely derived from remote sensing global and regional data**

**Use of Water Accounting tool such as WA+**

**Use of Solar Suitability tool**

**Use of socio-economic qualitative analysis.**

**Coding and web development to make tools and data accessible to stakeholders through web-based dashboard**

**Decision- making tools on WEF Nexus (Q-Nexus Web Tool) for multi-sectoral coordinated planning**

# WP4 Research questions- scientific methods

**Research question 2: How can water-energy-food Nexus governance be improved to strengthen resilience of food, land and water systems and improve productivity at country and basin level?**

**Strengthening inclusive policies and governance beyond water for integrated management across the food-land-water-energy nexus**

**Socioeconomic data analysis**

**Water governance analysis in piloting countries**

**Policy mapping and analysis**

**Qualitative analysis**

**Multi-stakeholders dialogue**

**Decision- making tools on WEF Nexus (Q-Nexus Web Tool) for multi-sectoral coordinated planning**

# WP4 Research questions- scientific methods

## Research question 3: How can water productivity be improved through water recycling and re-use at country and regional/watershed scale?

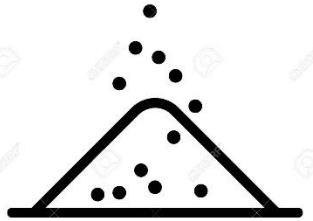
**Establishing the foundations for scaling up access to alternative water resources, including water recycling and re-use to improve water productivity, at country and watershed level**

- Water accounting and assessment analysis
- Gender mainstreaming and circular economy analysis
- Multi-stakeholder dialogue
- Experimentation site for treated wastewater reuse, irrigation systems, practices, crops, etc.
- Policy mapping and analysis, survey and quantitative methods including economic cost benefit analysis, and qualitative analysis methods

# WP4 Research questions- scientific methods

## Research question 4: How can the productivity of marginal and saline landscapes be maintained or improved at watershed and country level?

**Maintaining and improving productivity in marginal and saline landscapes**



**Remote sensing, and integrated hydrological modelling**

**Valuation of soil retention**

**Policy mapping and analysis**

**Multi-stakeholders dialogue**

**Socioeconomic data analysis**

**Qualitative analysis**

**Monitoring & evaluation**

# WP4-Innovations

## Farm to basin smart tools for water efficiency and management

**Smart tools for irrigation scheduling**

Smart phone App for irrigation scheduling- IRWI Application

**On farm water accounting**

for farm monitoring and management

**Smart tools for fertilizers scheduling**

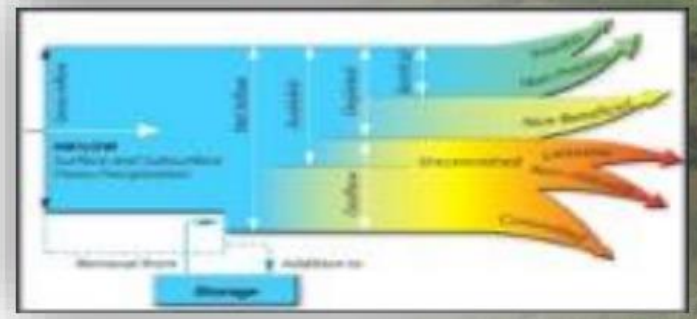
4Rs Fertilizers system
Fertilizers application using 4Rs: right source, right rate at the right time and the right place

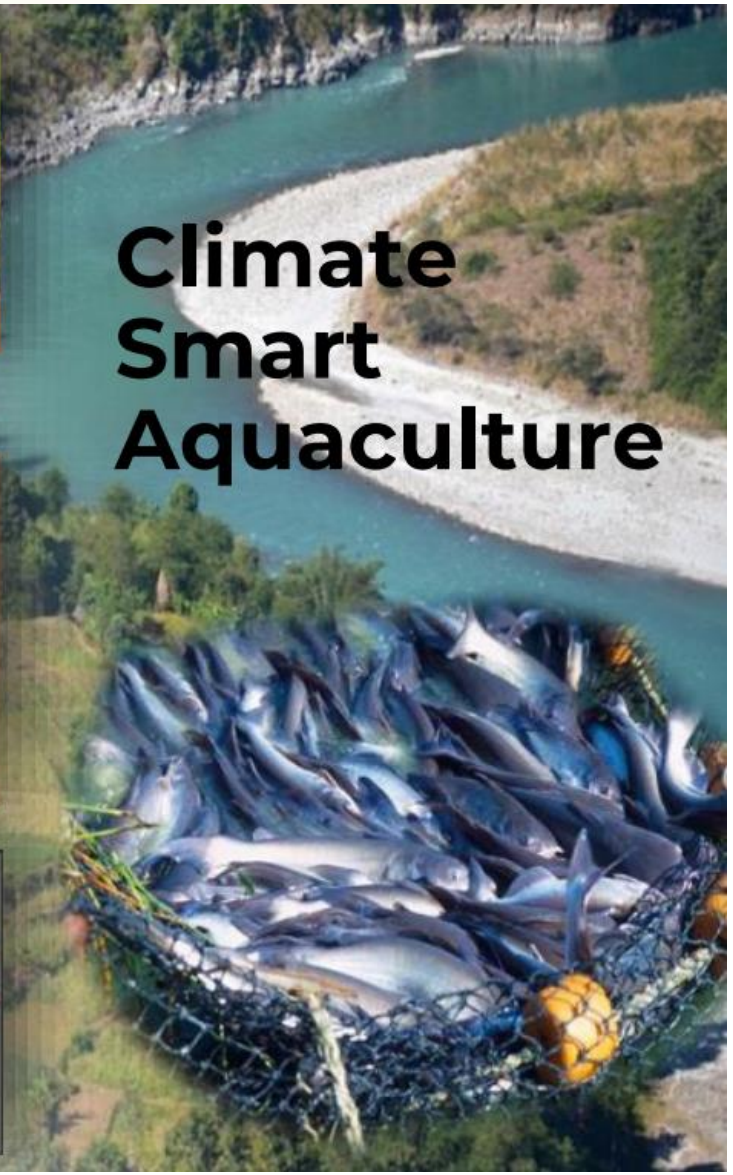
**Basin water accounting and assessment**

for basin planning and policy

**Water auditing**

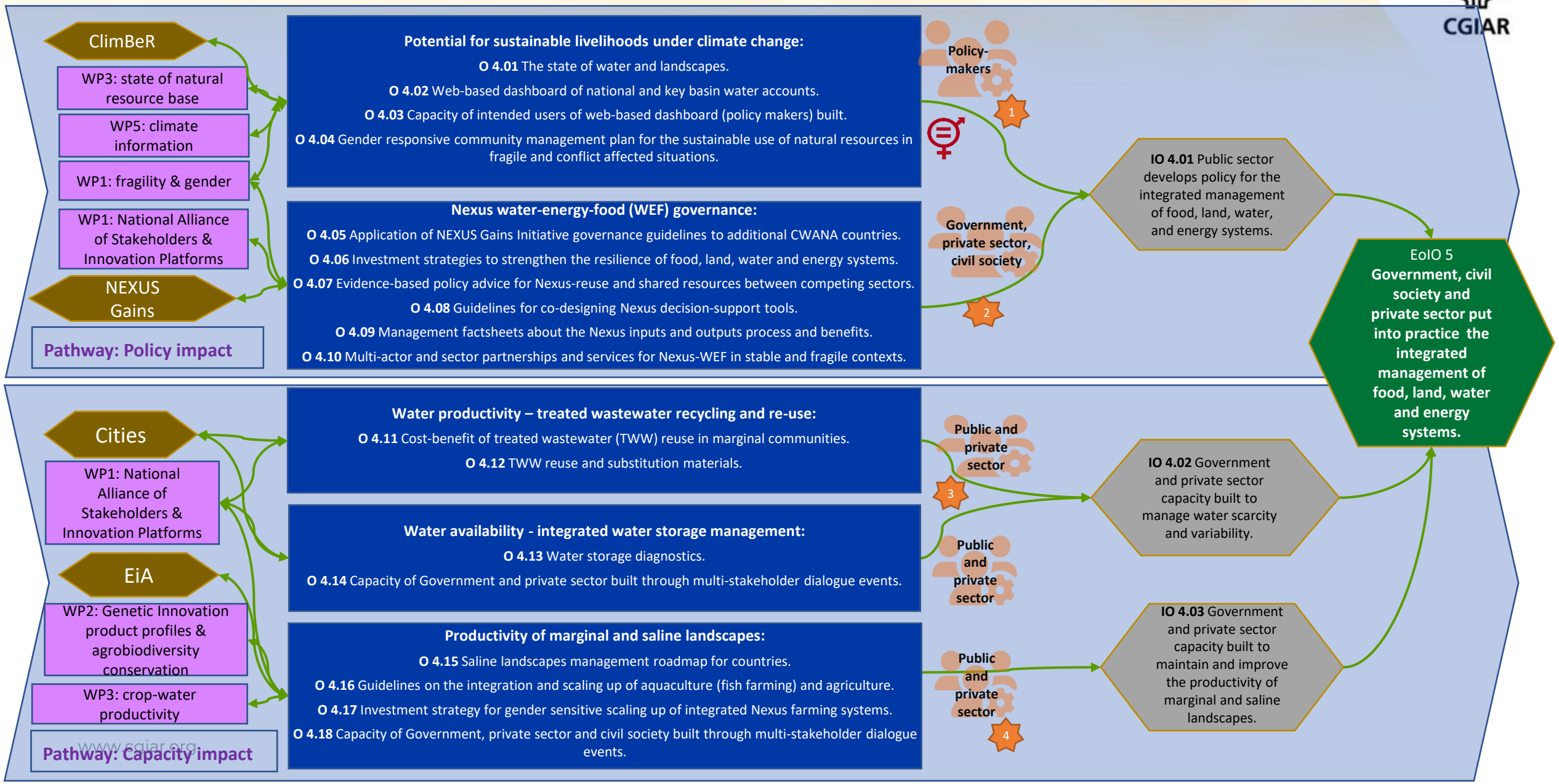
Water governance analysis



# WP4: Theory Of Change

## Work package 4: Integrated food, land, water and energy systems for climate resilient landscapes



# Plan of Results - Morocco

| Activities | Deliverables | Synergies with WPs | Scale/location (national, basin level, etc.) | Synergies CG Initiatives | Timeline | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2022 (Q3) | 2023 | 2024 | 2025 (Q2) |
| ***O 4.01 The state of water and landscapes analysed.*** *A1: Water resources status report on the status of current water resources, uses, and utilization* | *Literature review based on available published papers, reports, datasets: limits & potential* | *WP1, WP3, WP5* | *Basin and/or sub-basin scale (ex:Souss-Massa basin or Bouregreg basin)* | *ClimBeR, NEXUS Gains* | *x* | | | |
| ***O 4.02 Web-based dashboard of national and key basin water accounts developed.*** *A2: National Scale consultation on WA, three trainings on WA+* | *WA dashboard developed* | *WP1, WP3, WP5* | *Souss-Massa basin* | *ClimBeR, NEXUS Gains* | | *x* | | |
| | *two trainings on WA+ (10 to 15 technicians /managers trained)* | *WP1, WP3, WP5* | *Training 1 (central Dprt), Training 2 (Souss-Massa Basin)* | *ClimBeR, NEXUS Gains* | *x* | | | |
| ***O 4.03 Capacity of intended users of web-based dashboard (policy makers) built.*** *A3: National workshop with stakeholders* | *Reports & 5 to 10 managers trained* | *WP1, WP3, WP5* | *Training 1 (central Dprt), Training 2 (Souss-Massa Basin)* | *ClimBeR, NEXUS Gains* | | | *x* | |
| ***O 4.11 Cost-benefit of treated waste water (TWW) reuse in marginal communities.*** *A4: Identifying local sites to conduct cost-benefit analysis of TWW reuse in agriculture in marginal communities* | *Site characterization report* | *WP1, WP3* | *Basin or sub-basin scale (ex:Souss-Massa basin or Bouregreg basin)* | *Cities, EiA* | *x* | | | |
| ***O 4.12 TWW reuse and substitution materials.*** *A5: Revise the current National plans on safe reuse policies, stakeholders participatory workshop to identify gaps and needs* | *National reuse road maps for the selected countries* | *WP1, WP3* | *National* | *Cities, EiA* | | *x* | *x* | |

# Partners

| Activities | Potential partners | Role |
|---|---|---|
| ***O 4.01 The state of water and landscapes analysed.*** *A1: Water resources status report on the status of current water resources, uses, and utilization* | *Min. water & Agri, River basin agency, Met. Office, forests Dprt.* | *Provide data, define working areas* |
| ***O 4.02 Web-based dashboard of national and key basin water accounts developed.*** *A2: National Scale consultation on WA, three trainings on WA+* | *Min. water & Agri, River basin agency* | *Provide data. Participate in training* |
| | *Min. water, River basin agency* | |
| ***O 4.03 Capacity of intended users of web-based dashboard (policy makers) built.*** *A3: National workshop with stakeholders* | *Min. water & Agri, River basin agency* | *Participate in training workshops* |
| ***O 4.11 Cost-benefit of treated wastewater (TWW) reuse in marginal communities.*** *A4: Identifying local sites to conduct cost-benefit analysis of TWW reuse in agriculture in marginal communities* | *Min. water & Agri, River basin agency, forests Dprt., Growers, Water treatment Institute-ONEE, Population rep.* | *Provide data, identify sires* |
| ***O 4.12 TWW reuse and substitution materials.*** *A5: Revise the current National plans on safe reuse policies, stakeholders participatory workshop to identify gaps and needs* | *Min. water & Agri, River basin agency, forests Dprt., Growers, Water treatment Institute-ONEE, Population rep.* | *Provide data, organize meeting with local communities and demonstrate options* |

# Capacity Development Needs

| Activities | Potential partners | Capacity needs |
|---|---|---|
| ***O 4.01 The state of water and landscapes analyzed.*** *A1: Water resources status report on the status of current water resources, uses, and utilization* | *Min. water & Agri, River basin agency, Met. Office, forests Dprt.* | *Data analysis, data collection* |
| ***O 4.02 Web-based dashboard of national and key basin water accounts developed.*** *A2: National Scale consultation on WA, three trainings on WA+* | *Min. water & Agri, River basin agency* | *Data analysis* |
| | *Min. water, River basin agency* | |
| ***O 4.03 Capacity of intended users of web-based dashboard (policy makers) built.*** *A3: National workshop with stakeholders* | *Min. water & Agri, River basin agency* | *Training f Trainers (ToT)* |
| ***O 4.11 Cost-benefit of treated waste water (TWW) reuse in marginal communities.*** *A4: Identifying local sites to conduct cost-benefit analysis of TWW reuse in agriculture in marginal communities* | *Min. water & Agri, River basin agency, forests Dprt., Growers, Water treatment Institute-ONEE, Population rep.* | *Approaches of cost-benefit analysis* |
| ***O 4.12 TWW reuse and substitution materials.*** *A5: Revise the current National plans on safe reuse policies, stakeholders participatory workshop to identify gaps and needs* | *Min. water & Agri, River basin agency, forests Dprt., Growers, Water treatment Institute-ONEE, Population rep.* | *Approaches for gap analysis* |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THANK YOU!