

# **WATER – ENERGY – FOOD NEXUS**

## **Leading Strategies and Nexus in practice**

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**PROMESS - TUNISIA**

**BONTEMANTEL – NETHERLANDS**

**The Nature and Water Knowledge Sharing Forum  
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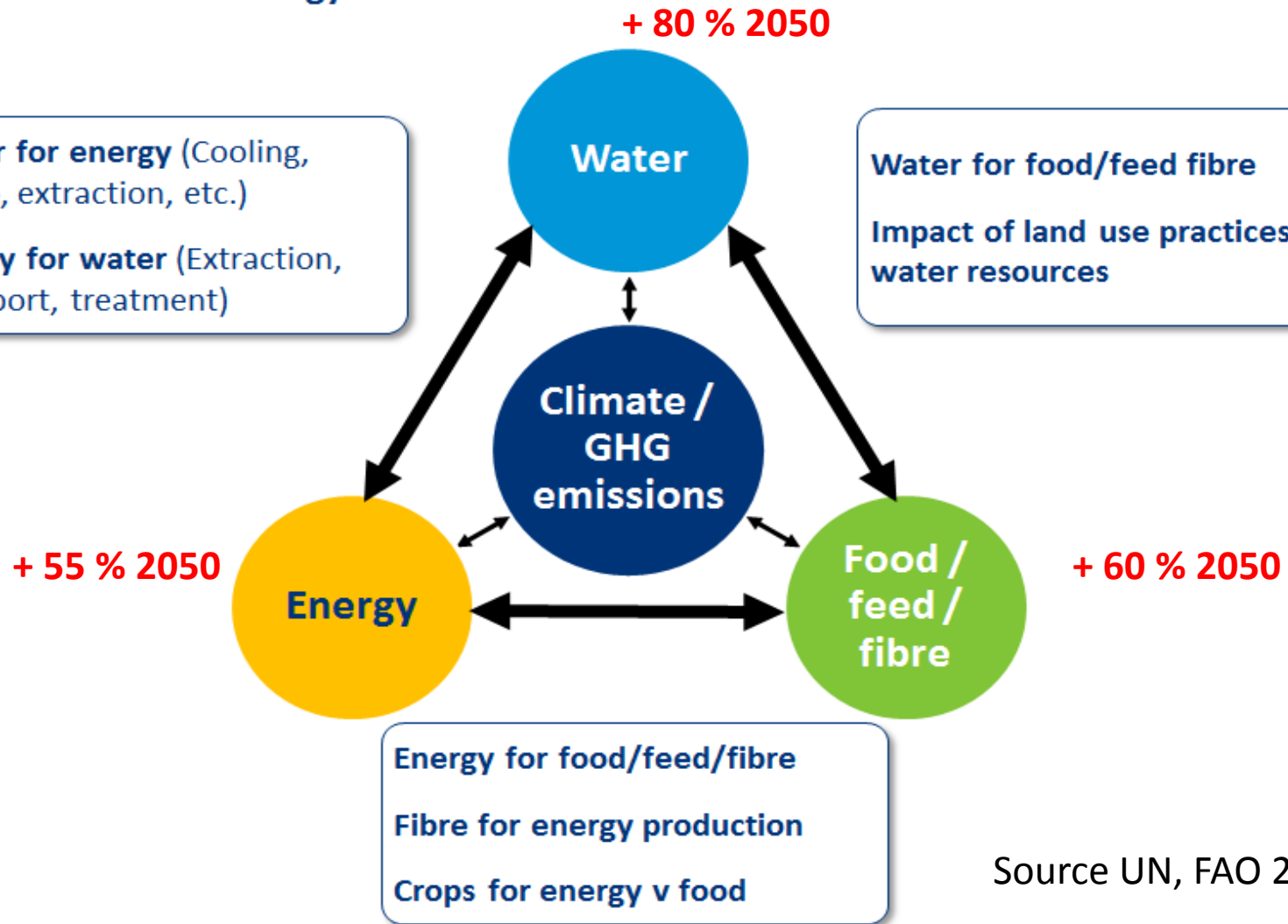
# Content of the presentation

- **What is the nexus?**
- **Why the nexus? Added value**
- **Nexus implementation**
- **Nexus assessment**
- **Nexus in practice**
- **Nexus in practice : A case from Tunisia**



# Water – Food – Energy Nexus ?

## The climate-water-energy-food nexus



Source UN, FAO 2011

**WEF Nexus interactions : complex and dynamic**



- **Balancing different resource user goals and interests**
- **While maintaining the integrity of ecosystems**

**! Human well being, poverty reduction and sustainable development**

## **WFE Nexus approach / Added value?**

- Cross-sectoral and dynamic perspective**
- Consider the impacts of a sector-related decision on the other sectors**
- Anticipate potential trade-offs and synergies**
- Design, appraise and prioritise response options that are viable accross different sectors**

# WFE Nexus approach / IWRM ?

## IWRM : Water Focus

- Prioritising water-related development goals
- Reinforcing traditional sectoral approaches

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## Nexus : Equal dimensions of W, E, F

- Recognize interdependencies
- Help avoid poor sectoral coordination, institutional fragmentation, inadequate capacity
- Address sectoral interests and political sensitivities
- Enhance participation and ownership

# WFE Nexus implementation

**1. Evidence:** Reliable, pertinent and timely data

➡ Analysis + dialogue

➡ Natural resources in link to human activities

**2. Scenario development:** Explore strategic questions, review policies and investment decisions

➡ Set of multiple, equally plausible future developments depending on how major driving forces develop and interact

**3. Response options:** Sustainable, impacts over sectors and over time

➡ 1. Planning and implementation of new policies, investments, regulations and incentives

➡ 2. Evaluation and comparison process

# WFE Nexus / Stakeholder dialogue ?

- Reconcile different views
- Raise awareness of the interlinked nature of global resources
- Build shared understanding aligned with needs and priorities
- Source relevant information
- Raise ownership, leadership and accountability
- Legitimize decision-making process

**Example: SE4ALL sustainable energy 4 all co-lead by  
FAO and German Federal Ministry of Economic  
Cooperation and Development BMZ**



# WFE Assessment ?

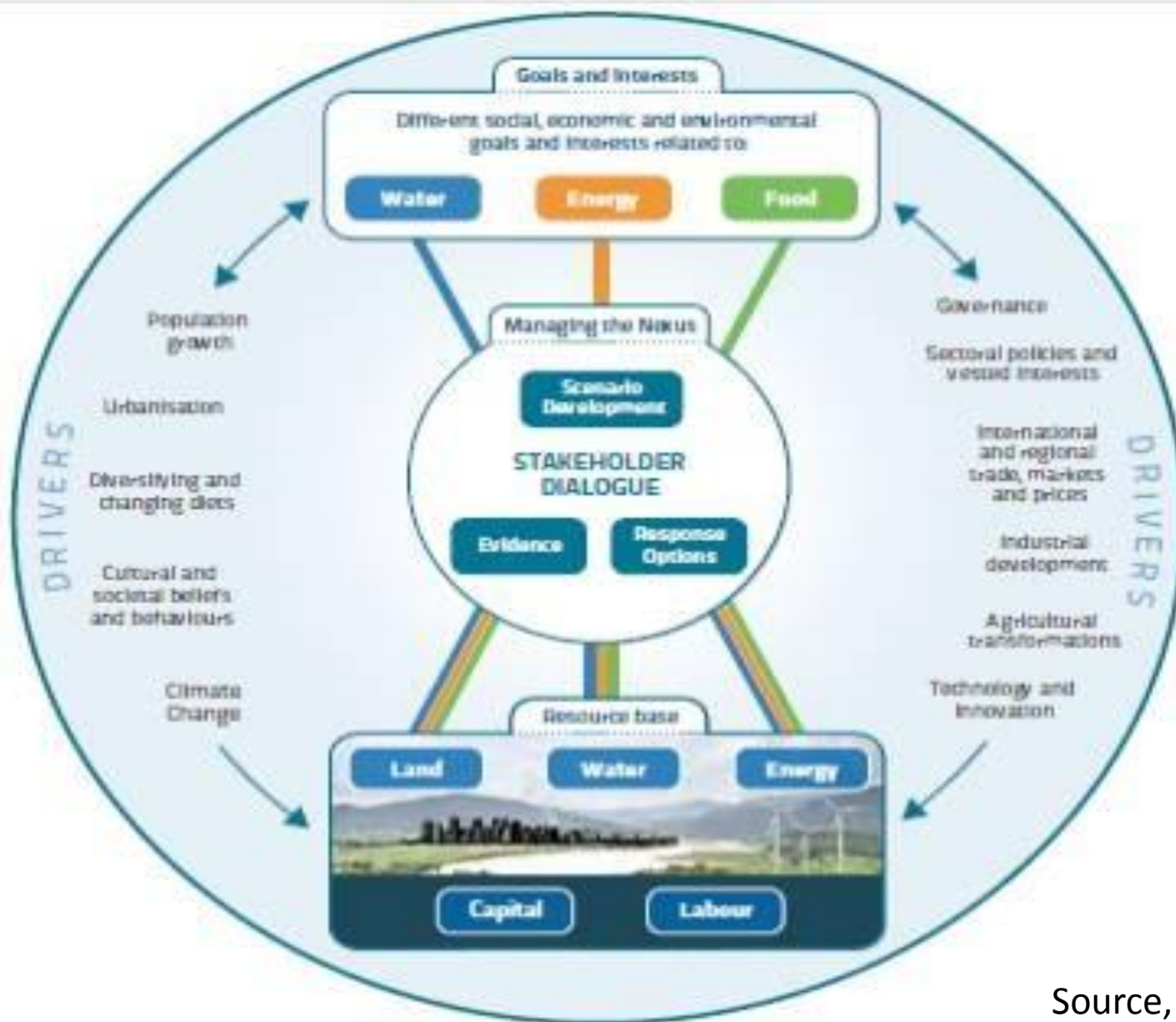
## 1. Understand the interactions between W, E, F systems link with human activity

- Current state and pressures
- Expected demands, trends and drivers
- Different sectoral goals, coordination, coherence, regulations
- Planned investments and reforms
- Key stakeholders

## 2. Evaluate the performance of a technical or policy intervention

- Resource use efficiency
- Reference to a specific context
- Compare different interventions

# FAO approach to WFE Nexus

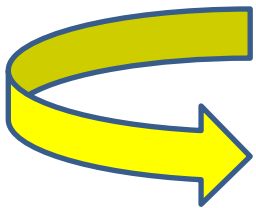


Source, FAO 2012

## CHALLENGE / NEXUS ANSWER

### PRESSURES AND TIGHTENING CONSTRAINTS

- Limited social and environmental shocks resilience
  - Critical thresholds of socio-ecological systems
- Land degradation, water scarcity, food crisis, inaffordable energy

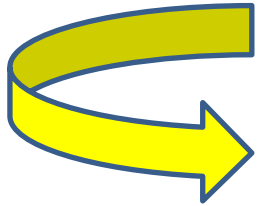


### NEXUS ANSWER

- Reconcile long-term and global objectives
- Climate protection
- Ecosystem stewardship
- Equity goals
- Human rights to water and food !
- Governance

## CHALLENGE

Inequitable human development

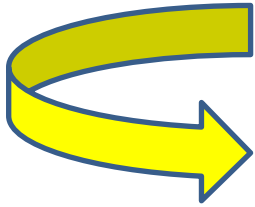


## NEXUS ANSWER

- Equitable access to food supply, clean water, sanitation and modern energy
- Pricing for resource and ecosystem services
- Avoid 'sunk costs' : investments that lock development into non-sustainable pathways
- Enhance multi-level governance
- Green growth / Green jobs

## CHALLENGE

Climate change

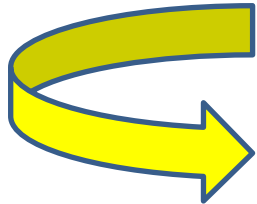


## NEXUS ANSWER

- **Help meet INDC (climate mitigation measures)**  
(Intended Nationally Determined Contributions, Paris 2015)
- **Adaptation measures (irrigation)**
- **Be more water smart**
- **Be less energy intensive**
- **Be more resilient to natural disasters (food / livestock capital)**
- **Encourage traditional crop production systems**

## CHALLENGE

**Urbanization** 1 billion urban slum dwellers / 2 B 2030



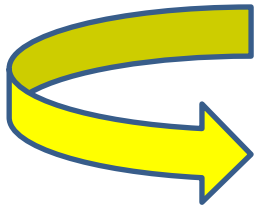
## NEXUS ANSWER

- Green and pro-poor development
- Ecohousing, green building
- Energy – efficient building
- Renewable bio-based construction materials
- Waste as a resource in multi-use systems
- Green agriculture
- Wastewater-energy irrigation
- Waste to energy

## CHALLENGE

**Globalization** - Resources externalization

## NEXUS ANSWER

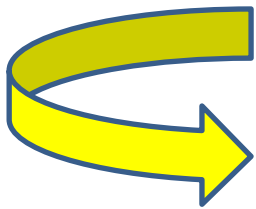


- Trade and foreign direct investments in developing areas
- Provide resources to scarcity regions  
'virtual water imports'
- Mainstream Cooperation Devt actions

## CHALLENGE

Disproportional availability of water, energy and land

## NEXUS ANSWER



- Increase resource use efficiency
- Technological Innovation and Research
- Addressing externalities accross sectors
  - \* Desalinisation – ‘bottled electricy’
  - \* Increasing soil storage
  - \* Groundwater recharge
  - \* Reducing use of energy-intensive fertilisers



# WEF Nexus in practice : a case from Tunisia

## The Reuse of TWW in Ouljet Elkhodher, Medenine

WWTP (ONAS)



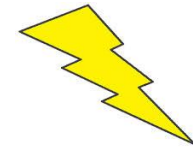
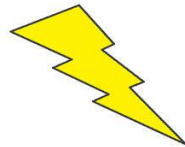
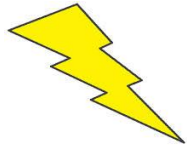
Storage basin  
CRDA, 1000m3  
Water distributor



Pumping station  
CRDA



Ouljet elkhodhe  
rirrigated perimeter



Monitoring institutions (Ministries of Health and Environment)

Source:

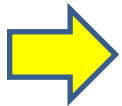
SWIM-Sustain Water MED, GIZ, Tunisia

# WEF Nexus in practice : a case from Tunisia

## The Reuse of TWW in Ouljet Elkhodher: Why it doesn't work?

- The quality of TWW is not conform with national reuse standards (bacteriological aspect)
- Lack of trust between farmers and water supplier
- Conflict situation between ONAS and Monitoring institutions
- Lack of stakeholders functioning communication channels
- Absent public participation
- Limited transparency and access to information
- Crisis management rather than long-term management

**! ABSENCE OF GOOD GOVERNANCE**



**IMPROVE WEF NEXUS EFFICIENCY?**

**شكرا – MERCI - THANK YOU**

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