International Institute for Applied Systems Analysis
IIASA www.iiasa.ac.at

## African experiences

# Integrated Approaches to the Sustainable Development Goals

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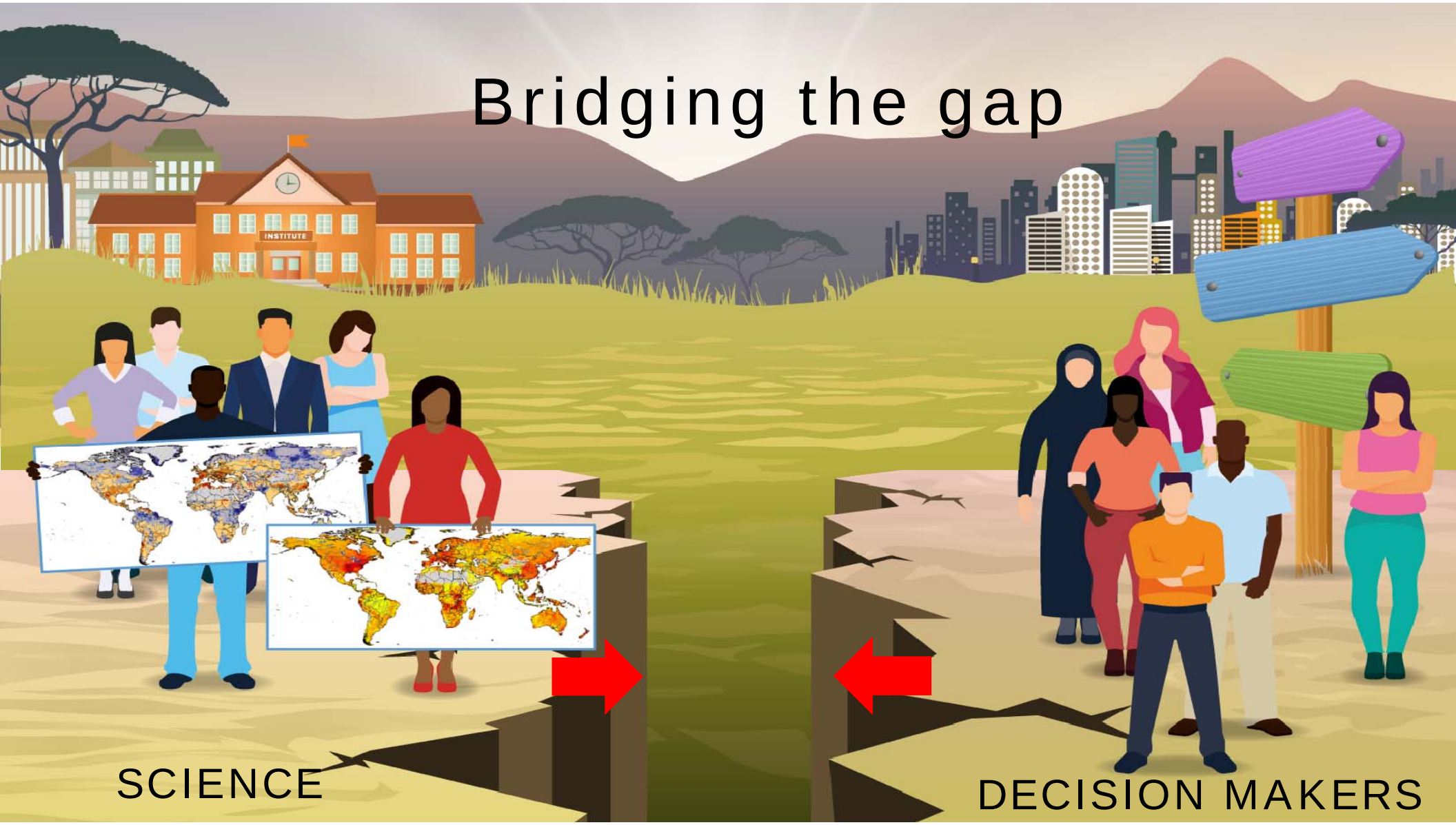
**International Institute for Applied Systems Analysis**
Sustainability Nexus Research Cluster and Water Program

# Outline

- Integrated approach in practice
- Experiences from African projects
- Lessons learnt

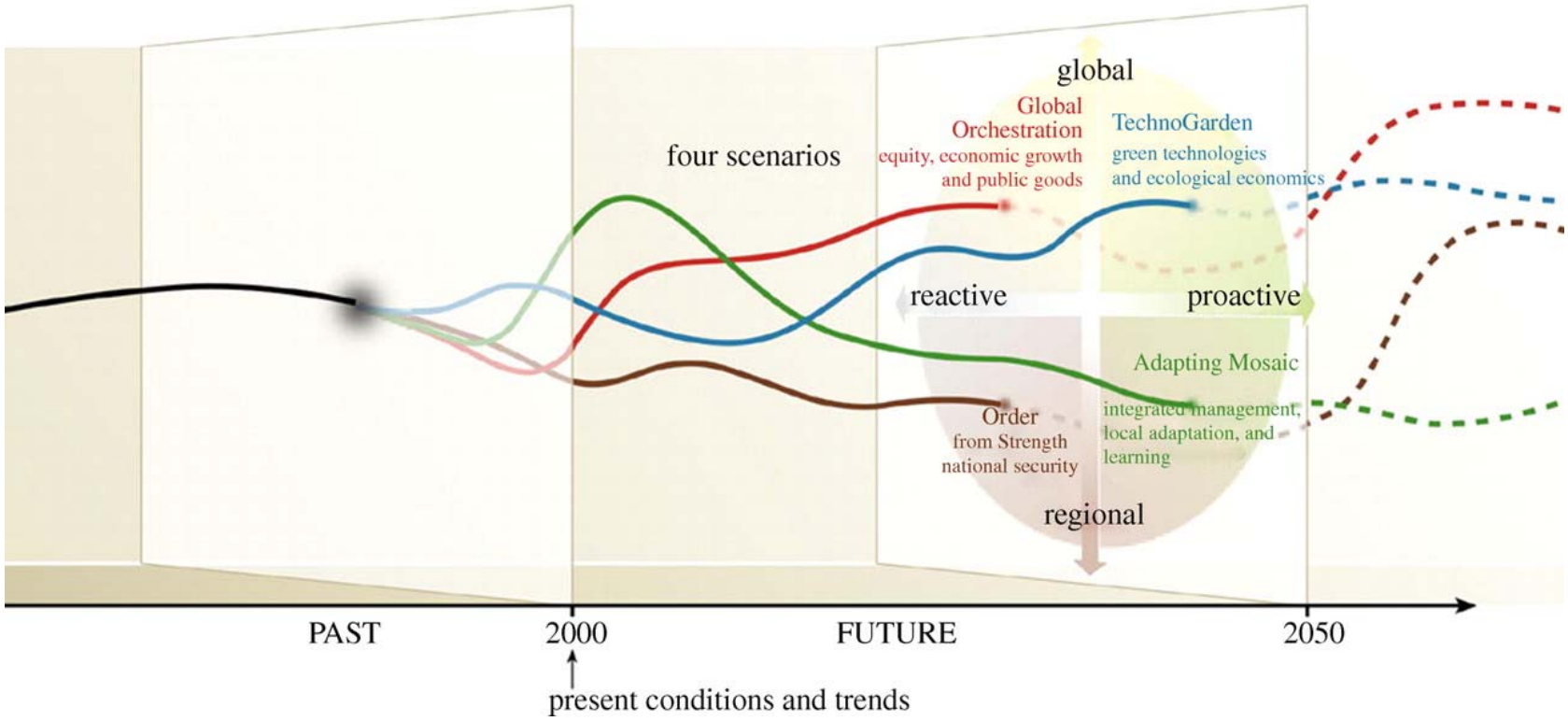
# What means looking through the lens of SA?


Bridging the gap
INSTITUTE
SCIENCE
DECISION MAKERS

# Forward looking-needing a vision


FORECAST …
… fails in complex realities

# Scenarios


four scenarios
global
Global
Orchestration
equity, economic growth
and public goods
TechnoGarden
green technologies
and ecological economics
reactive
proactive
Adapting Mosaic
integrated management,
local adaptation, and
learning
Order
from Strength
national security
regional
PAST
2000
FUTURE
2050
present conditions and trends

# Knowledge sharing and transfer

# IIASA regional approach to SA

1. Applied science ↔ Science for (sustainable) development

2. Combination of modeling and participatory approaches

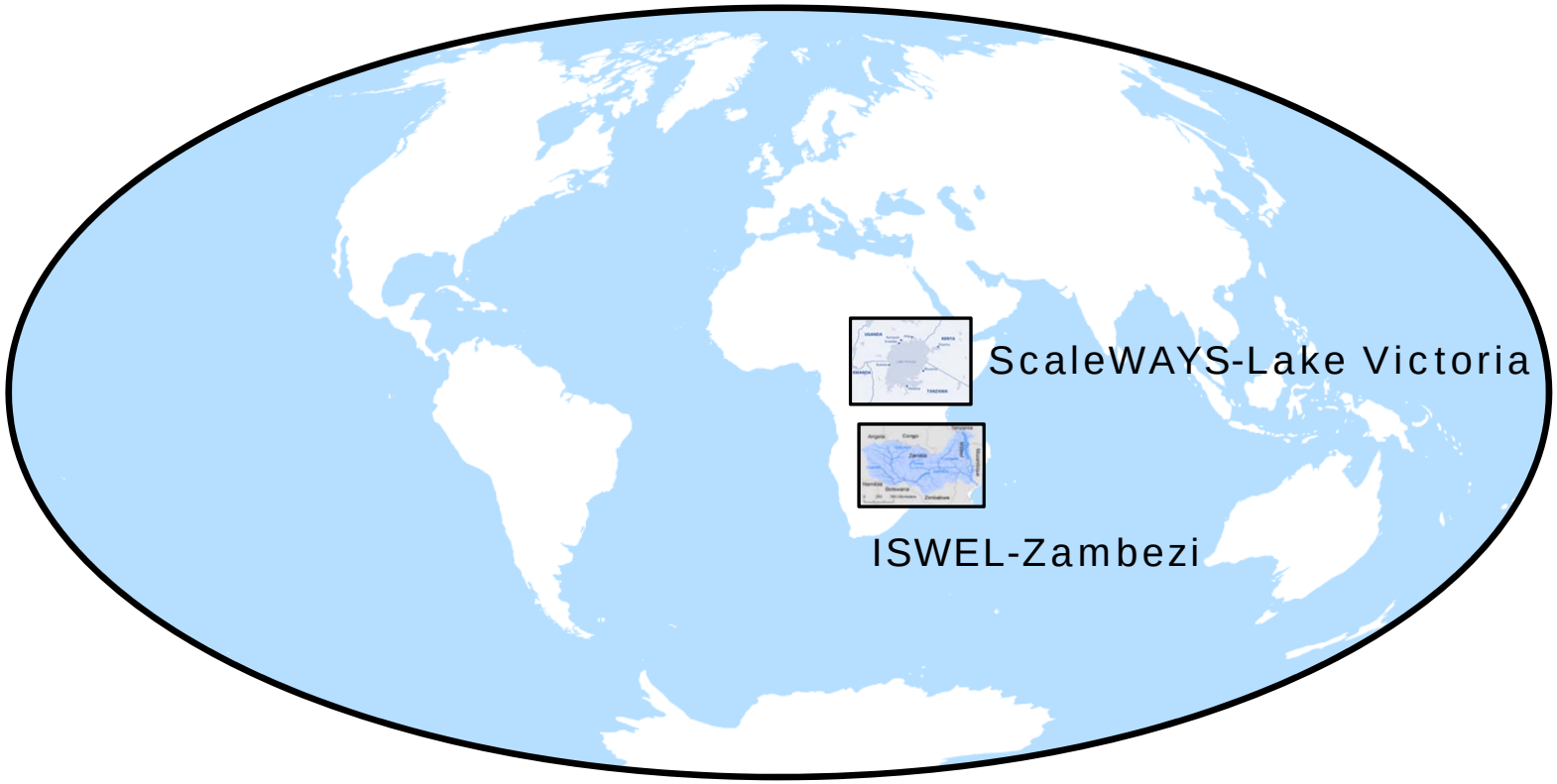
3. Forward looking

4. Knowledge sharing and capacity enhancement

# Outline

- Integrated approach in practice
- Experiences from African projects
- Lessons learnt

# Ongoing projects in Africa



# scaleWAYS:
# Scaling out resilient Water and Agricultural Systems
(2019-2021)

Partnership:

ICRISAT
INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS

EAC
JUMUIYA YA AFRIKA MASHARIKI

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WITH FUNDING FROM
AUSTRIAN DEVELOPMENT COOPERATION

# The quest

- **up to 2050: doubling of population, 7-fold GDP per capita**

  Resilient agricultural systems to feed the growing population with changing diets
- **Agriculture main water consumer**

  from currently >50% and >70% by 2050
- **Solutions exist**

  in form of pilot projects and practices.
- **If brought to scale:**

  What is the impact? What are trade-offs? What is driving/preventing scaling out?

# ISWEL:
# Integrated Solutions for Water Energy and Land
(2017-2020)

*"Develop tools and capacities that can support the management of the water-energy-land nexus at global and regional scales"*

Partners:

GEF Contract Agreement: 6993

# ISWEL team

## Executive Team


Keywan Riahi


Simon Langan


Michael Obersteiner


Arnulf Grubler

**Project Manager**


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Volker Krey


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Taher Kahil


Junko Mochizuki


Ting Tang


Piotr Magnuszewski


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## ESM


Amanda Palazzo


Michiel van Dijk


David Leclere


Juraj Balkovic


Andre Deppermann

## TNT


Caroline Zimm


Beatriz Mayor

## Ext. Steering Com.


David Grey


Leena Srivastava


Youba Soukona

## Partners

gef
GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

UNIDO

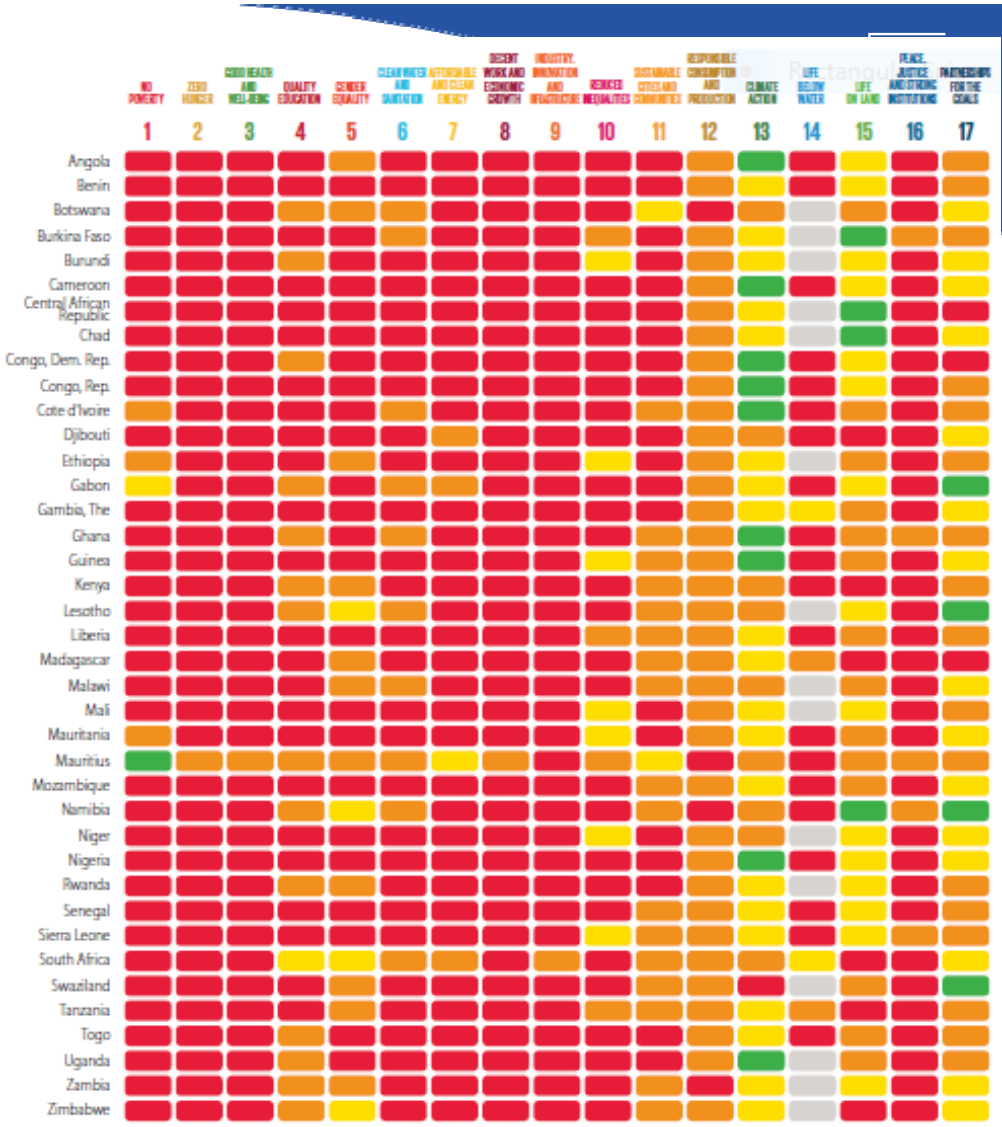

Astrid Hillers


Robert Novak

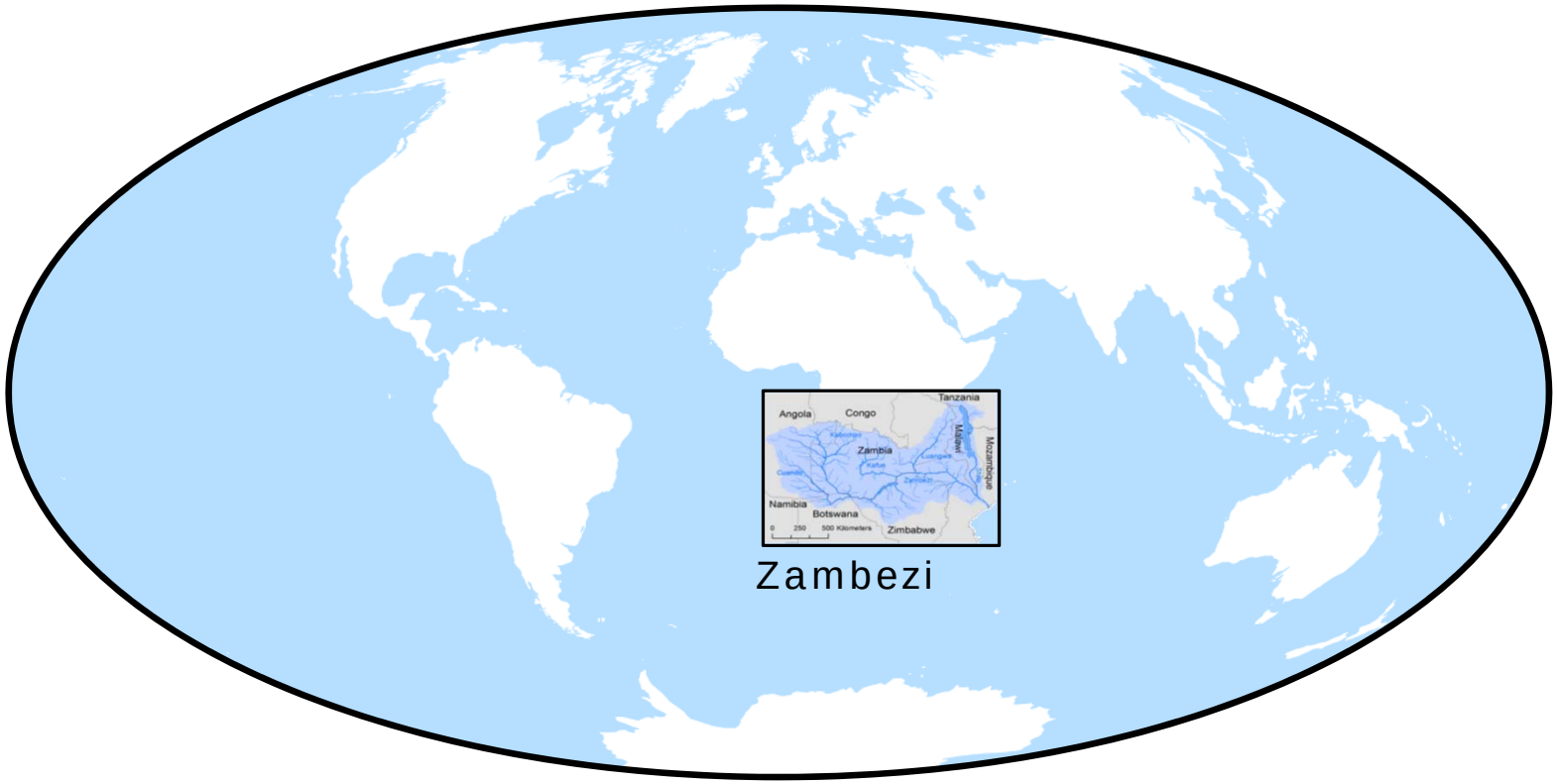
# The ISWEL quest

Failing to meet the SDG agenda:

Costs
Lack of cooperation
Different Values/Priorities
Trade-offs



# Basin Assessment



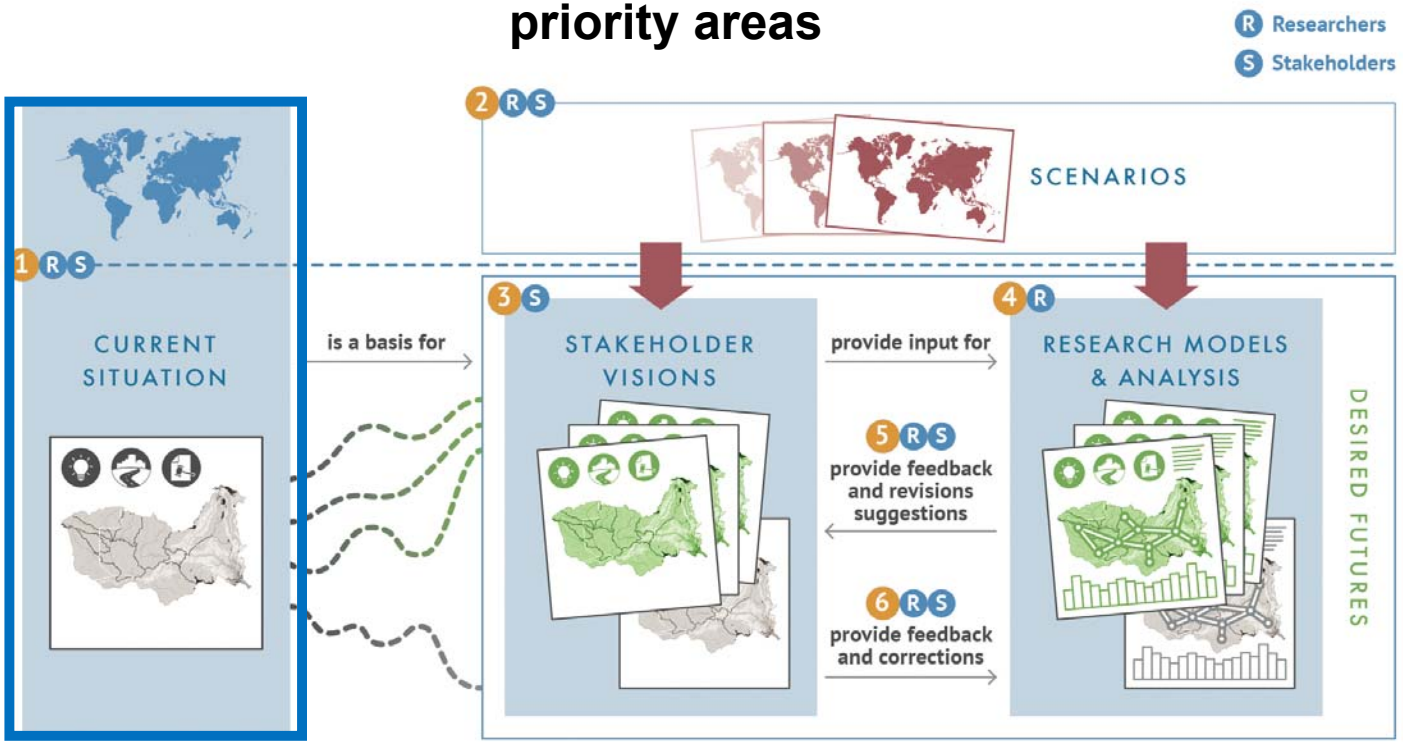

Zambezi

# Outputs

1. Quantitative and qualitative tools to explore nexus challenges
   a) Regional basin planning model (policy optimization IAM)
   b) Scenario tool to co-develop basin visions and transformation pathways
   c) Serious games
   d) Simulation exercise for non-technical audiences
2. Stakeholder informed WEL 2050 scenarios
3. Enhanced capacities for nexus management and research
   a) Research collaborations (joint papers)
   b) Trainings (models, and scenario tool)

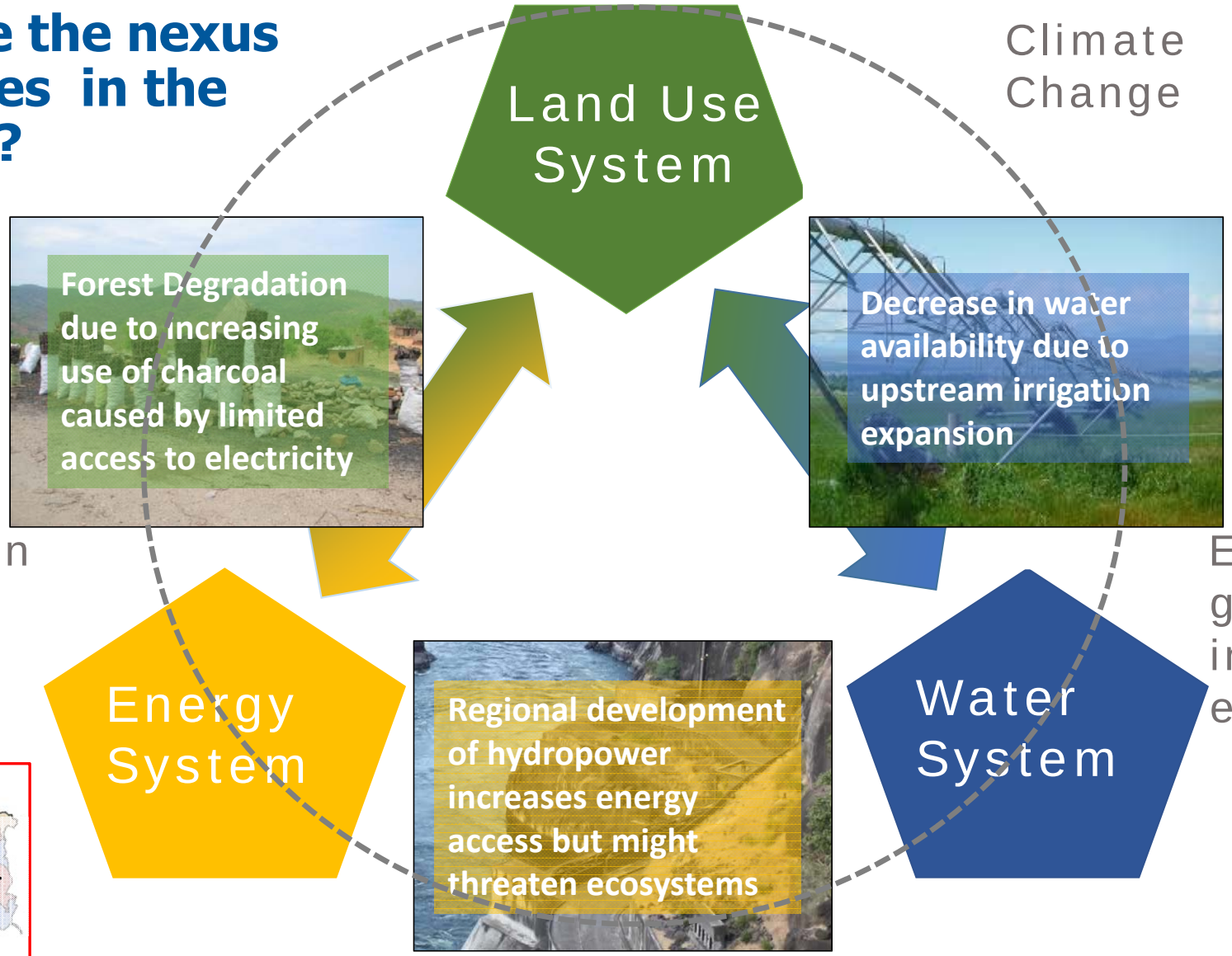
# Basin Approach

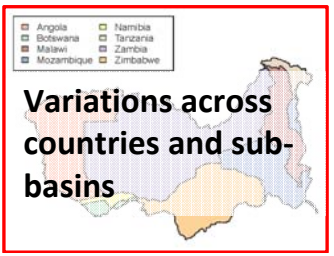
**Understanding current challenges and identifying priority areas**



# Zambezi Stakeholders

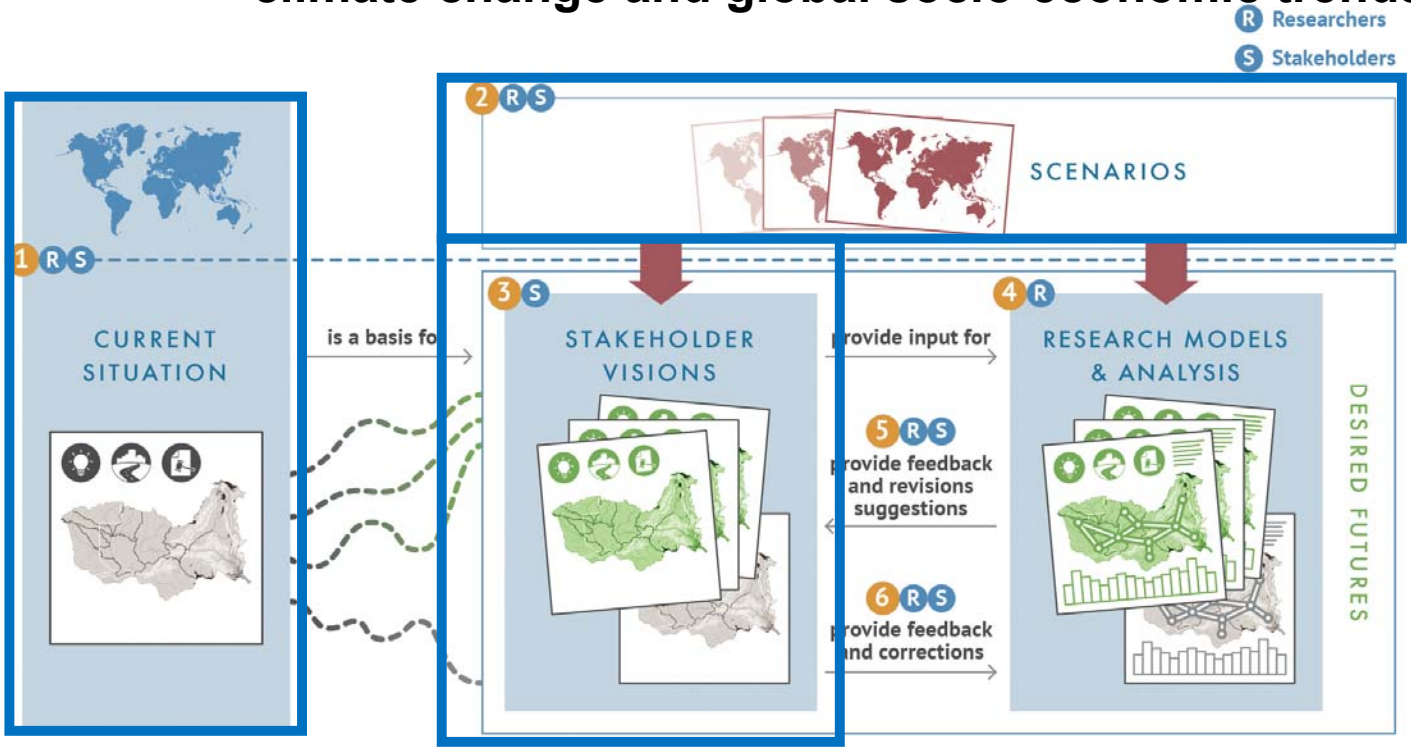
# What are the nexus challenges in the Zambezi?



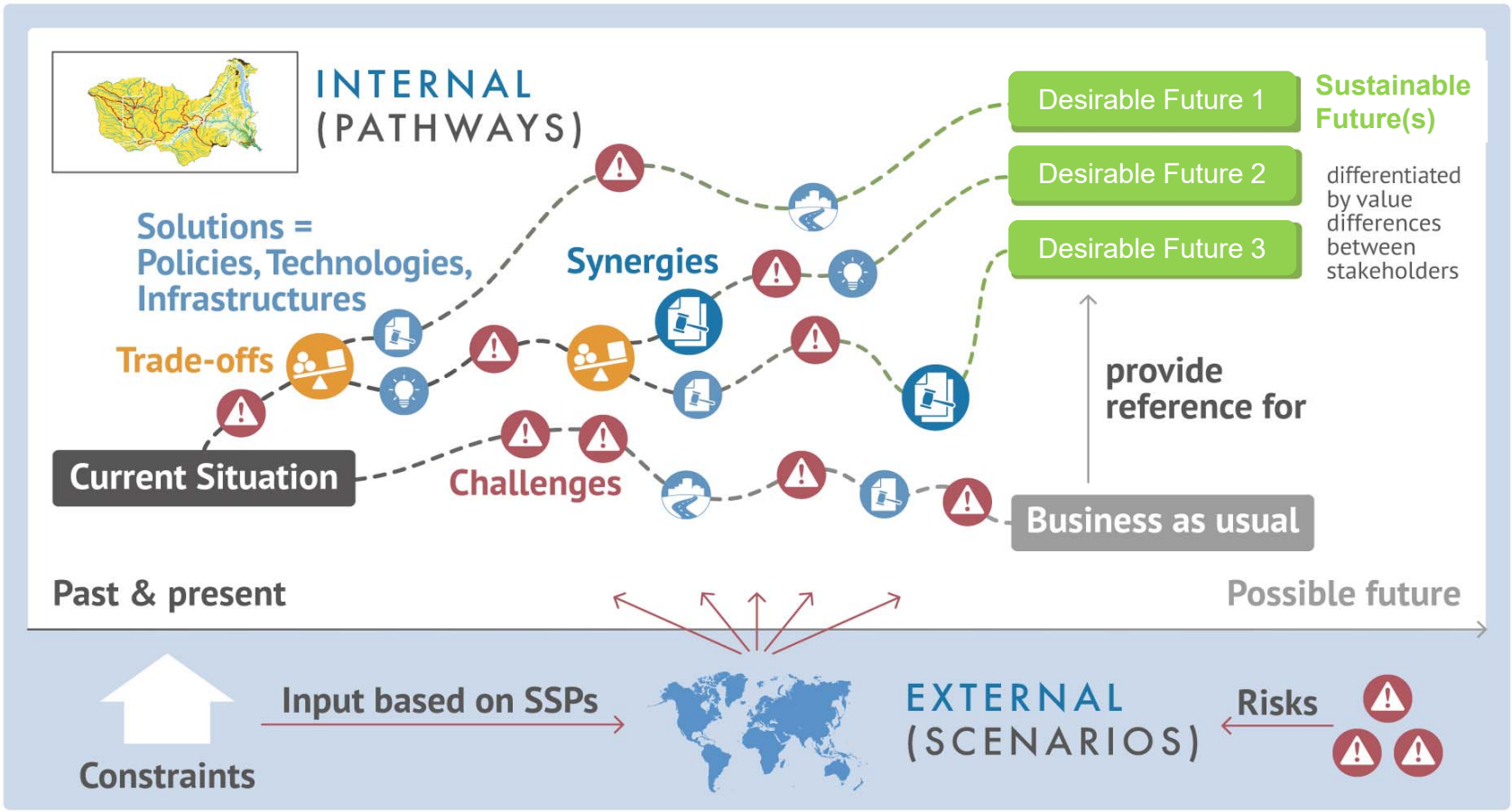



# Basin Approach

**Co-develop basin visions and pathways robust to climate change and global socio-economic trends**



# Scenario tool: Envisioning the basin future and transformation pathways



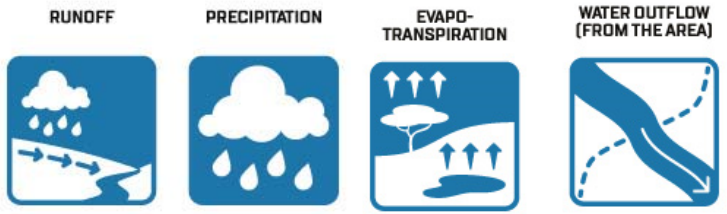
# Scenario tool kit

## Map

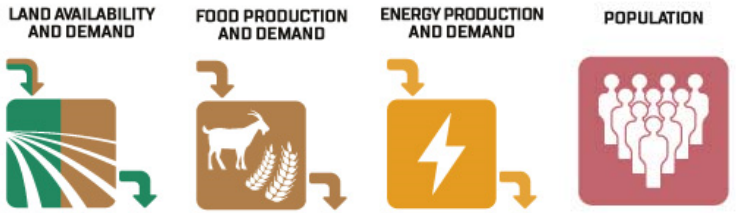

## Cards

### Indicators

Natural

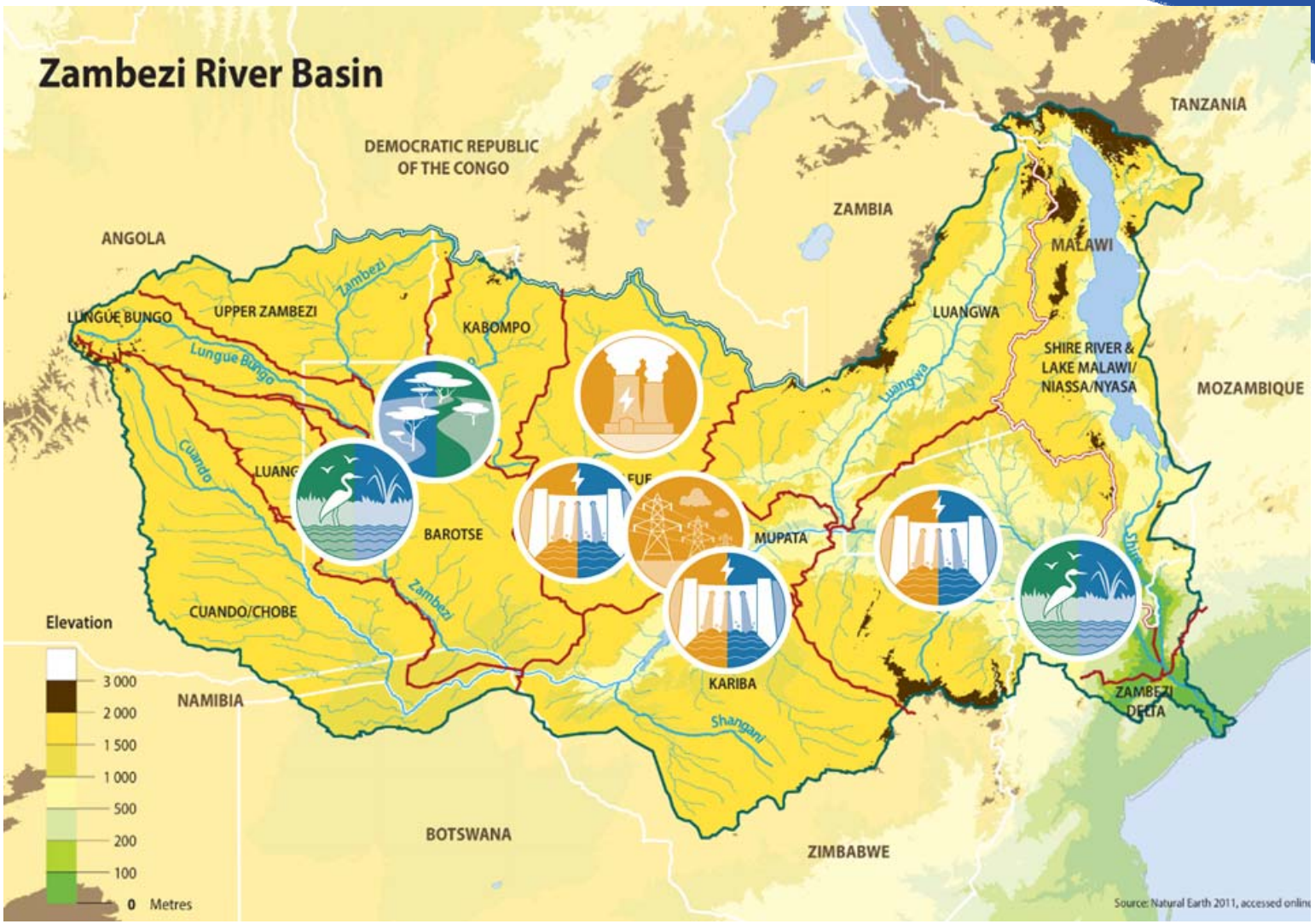



Socio-economic



STEP 1

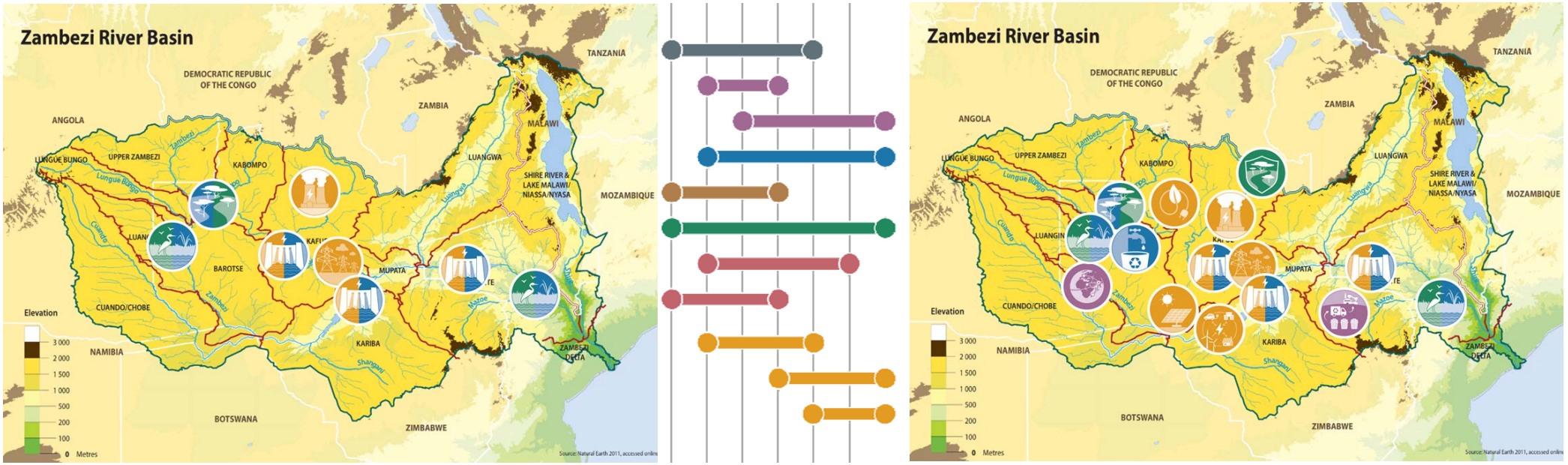
# CURRENT SITUATION

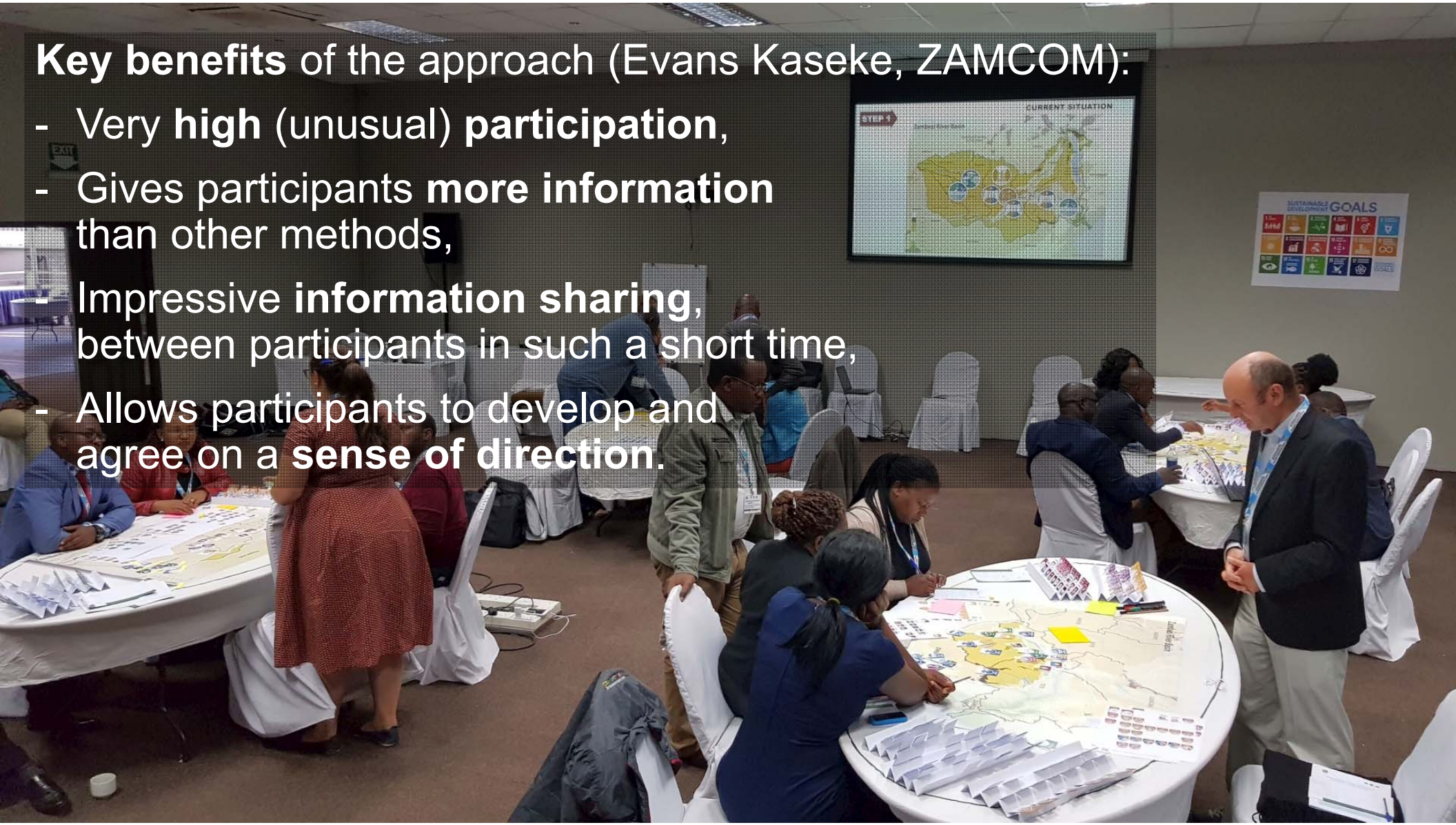


STEP 2

# Desired Future Pathway

2018 → 2050



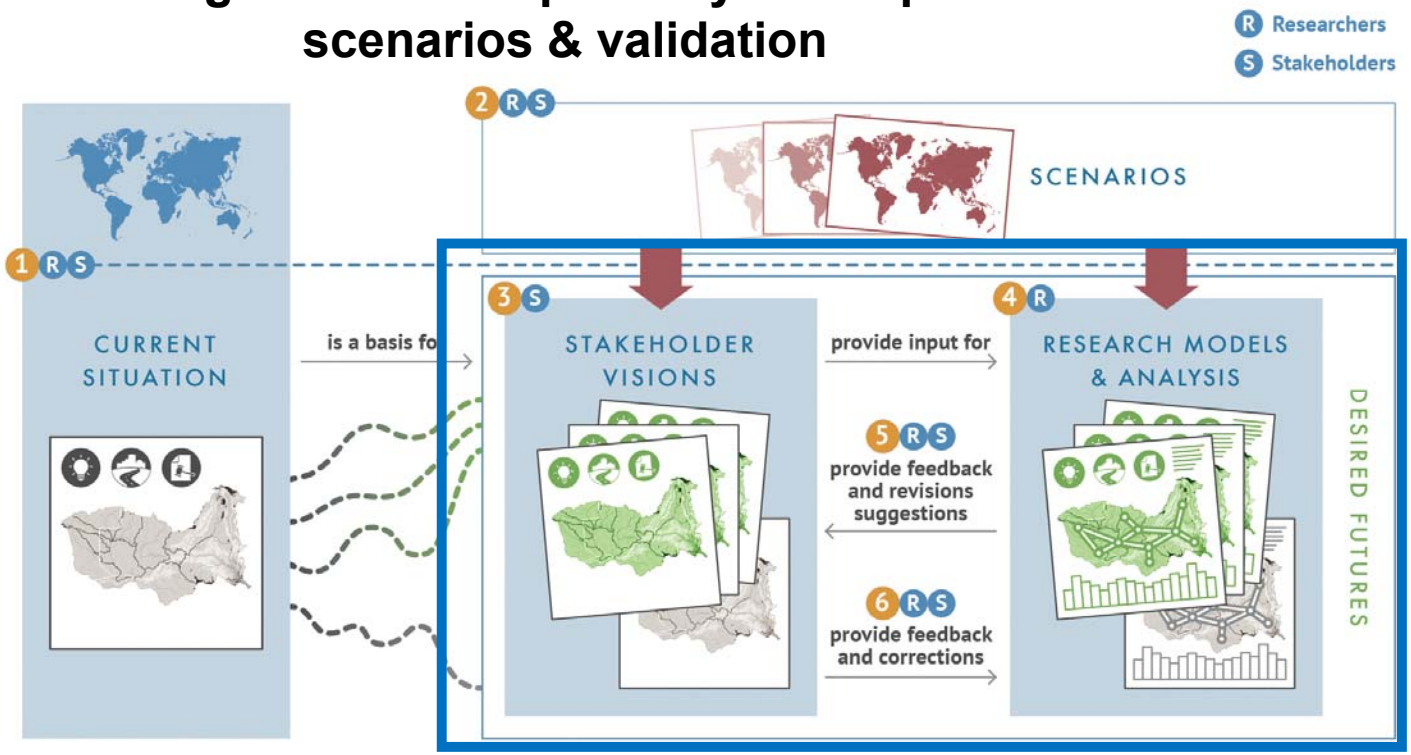



**Key benefits** of the approach (Evans Kaseke, ZAMCOM):

- Very **high** (unusual) **participation**,
- Gives participants **more information** than other methods,
- Impressive **information sharing**, between participants in such a short time,
- Allows participants to develop and agree on a **sense of direction**.

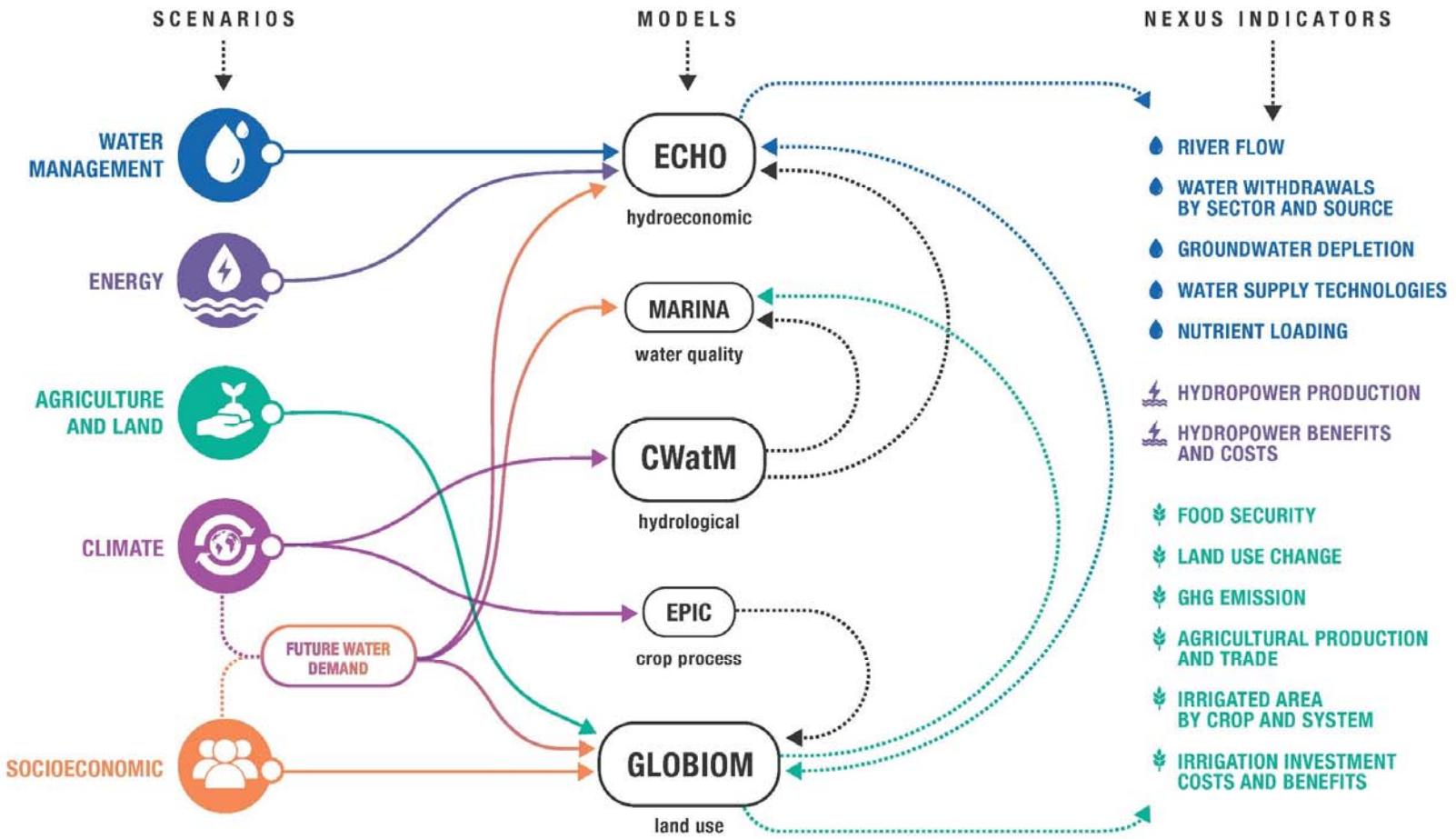
# Basin Approach

**Translating stakeholder pathways into quantitative scenarios & validation**



# Modeling framework

# Zambezi IAM Framework




SDG6

SDG7

SDG2

SDG13

SDG15

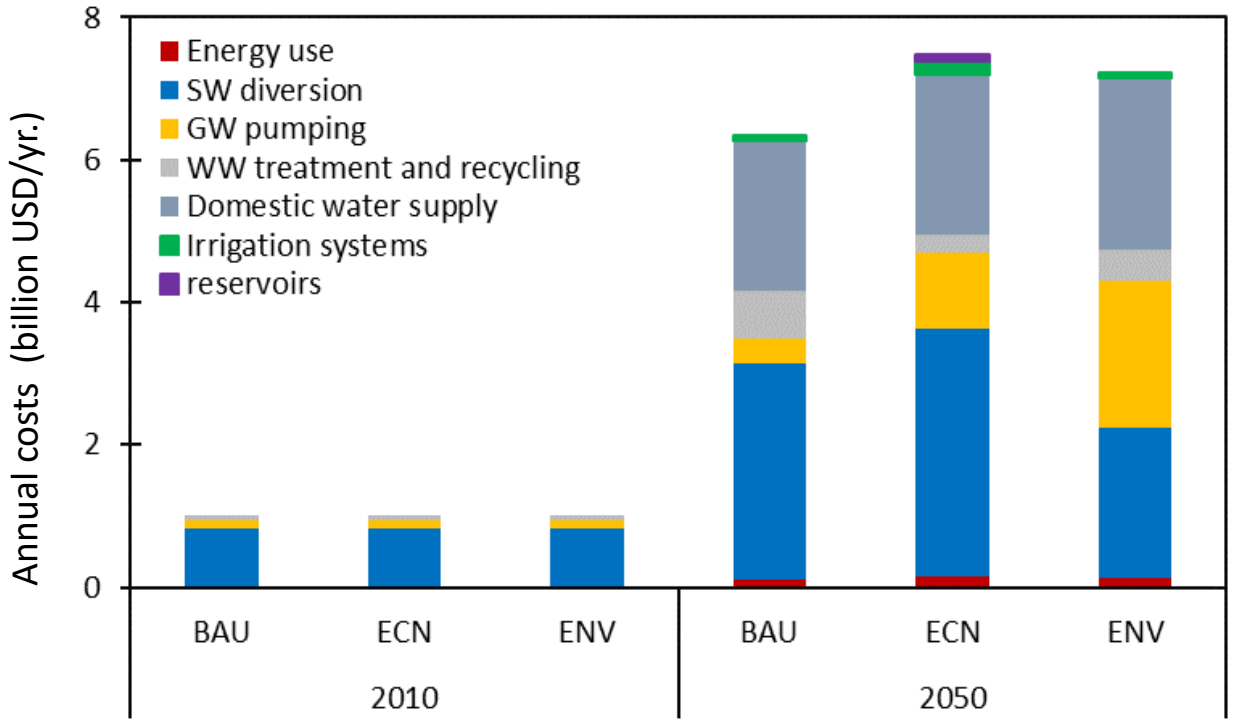
# Zambezi Visions and Pathways to 2050

**BAU:** Hydropower potential fully developed; irrigation plans implemented
Maximize surface water use
Little adaptive planning to Climate Change
Environmental flows and wetlands flows constrained by economic develop

**ECON:** Increasing trade-openness
Hydropower potential fully developed; Irrigation development prioritized
Increasing efficiency is compensating the sectoral demands for water
Partial Climate Change adaption (inter-basin transfers)
Environmental flows and wetlands flows are not fully implemented

**ENV:** Environmental flows and wetlands flows priority targets
Irrigation and hydropower constrained by meeting EF
Adaptive planning to Climate Change (groundwater use and other renewable energy sources promoted, cooperation)

# Zambezi scenarios- Costs

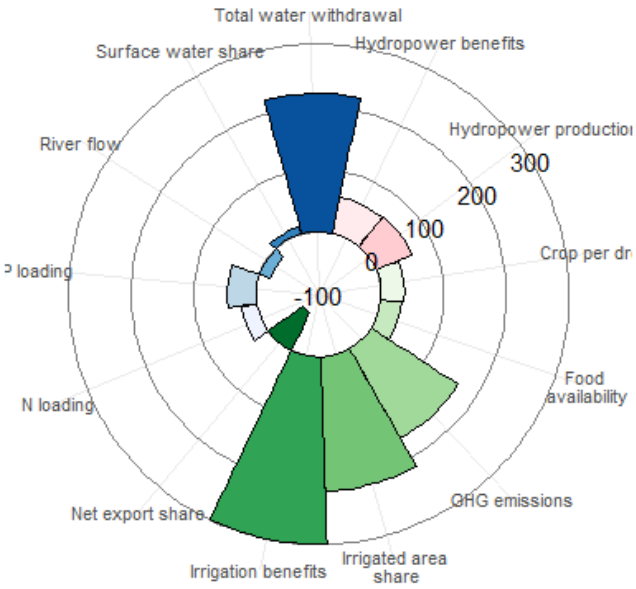



*Annual costs includes: investment, operational and maintenance costs*

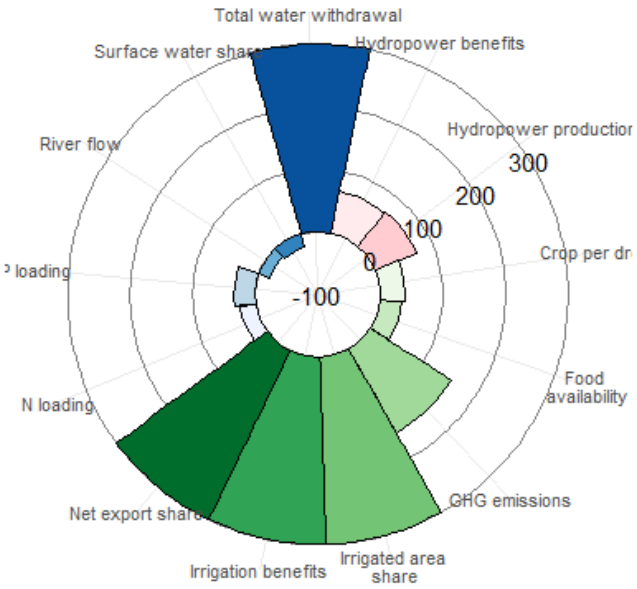
# Zambezi Scenarios-Benefits

*% of change with respect to the baseline*

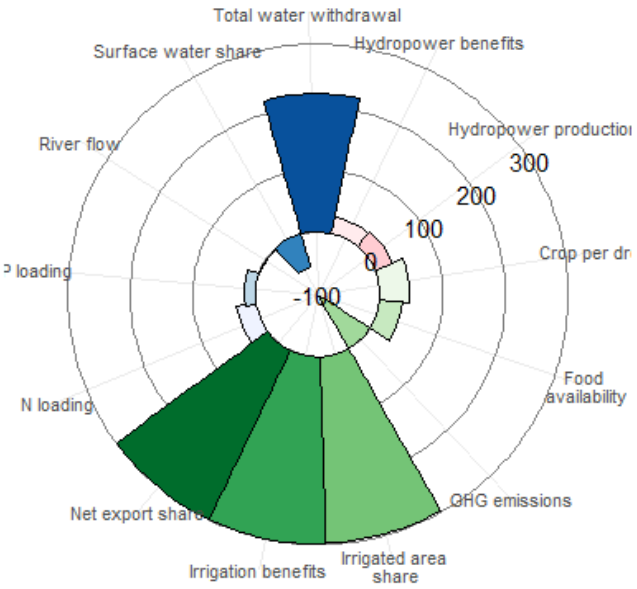
## BAU




## Economy first




## Environment first



# The Nexus Game

“I was surprised by how **engaging** the **Nexus Game** was! **Serious games** are a valuable tool to get people **see** something from **different perspectives** and to play different roles to **see the larger picture** and experiment in a risk-free environment. Such exercises can **build trust** and **understanding**.”

# Hand-on real simulation exercise

"This tool has great potential to support difficult negotiations between stakeholders in the real world situations"

# Outline

- Integrated approach in practice
- Experiences from African projects
- Lessons learnt

# Lessons learnt

## What is innovative and worked out?

1. Flexible and state of the art (open source) tools
2. Combination of qualitative and quantitative tools suitable for policy identification and measurement
3. Pack "Tools + training" facilitates transference and ownership
4. Enhanced nexus capacities of a wide range of users and audiences
5. Evidence base of why nexus approach is more cost effective

## What is next?

1. Effective implementation requires buy-in and active support from countries and investors → Create strong partnerships
2. Scaling this pilot initiatives. Moving away from projects to plans and programs

# Thanks

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www.ISWEL.org