

Scenario Development in the context of Water-Energy-Land Nexus

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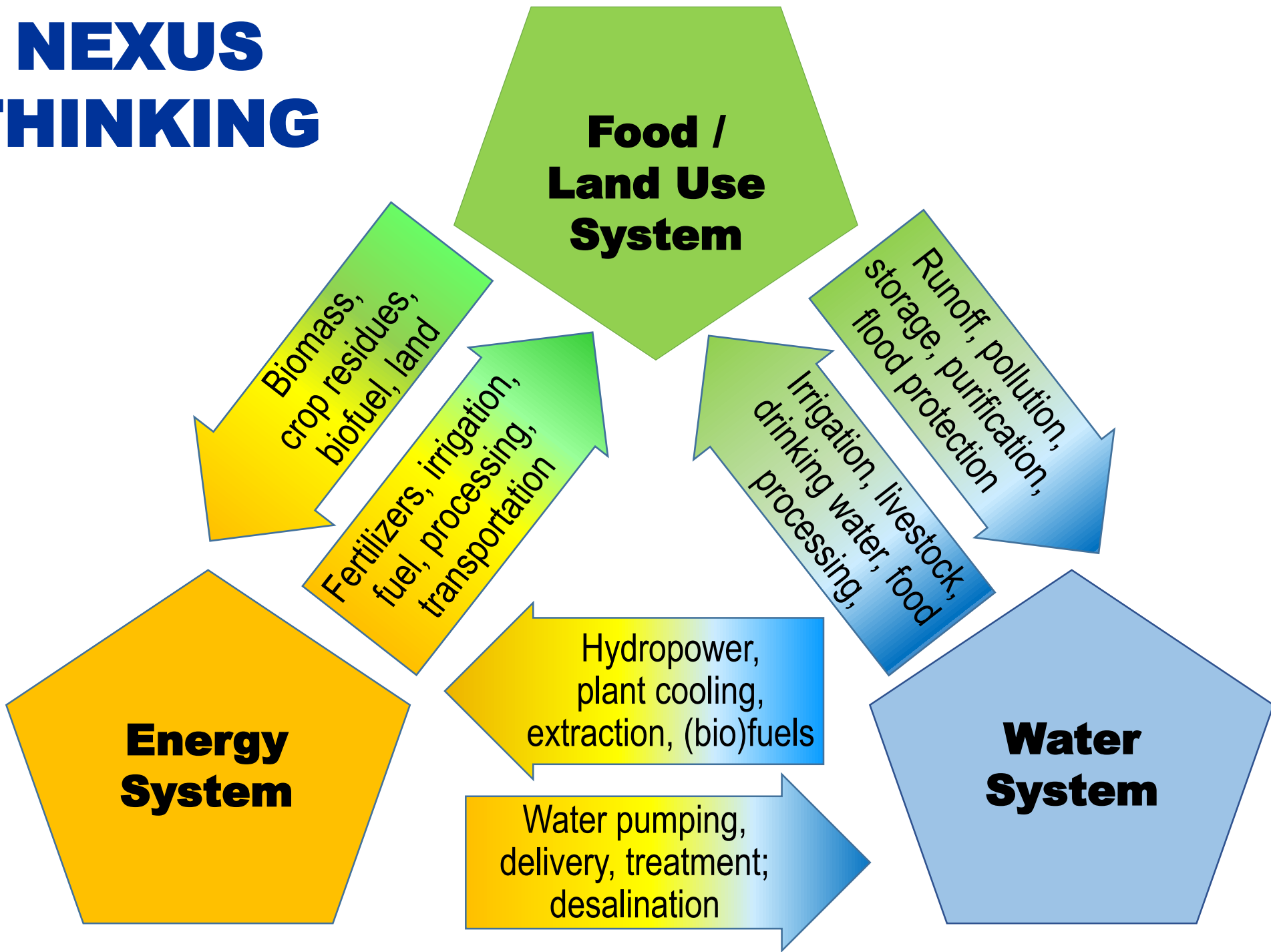
5th Targeted Regional Workshop for GEF IW projects in Africa



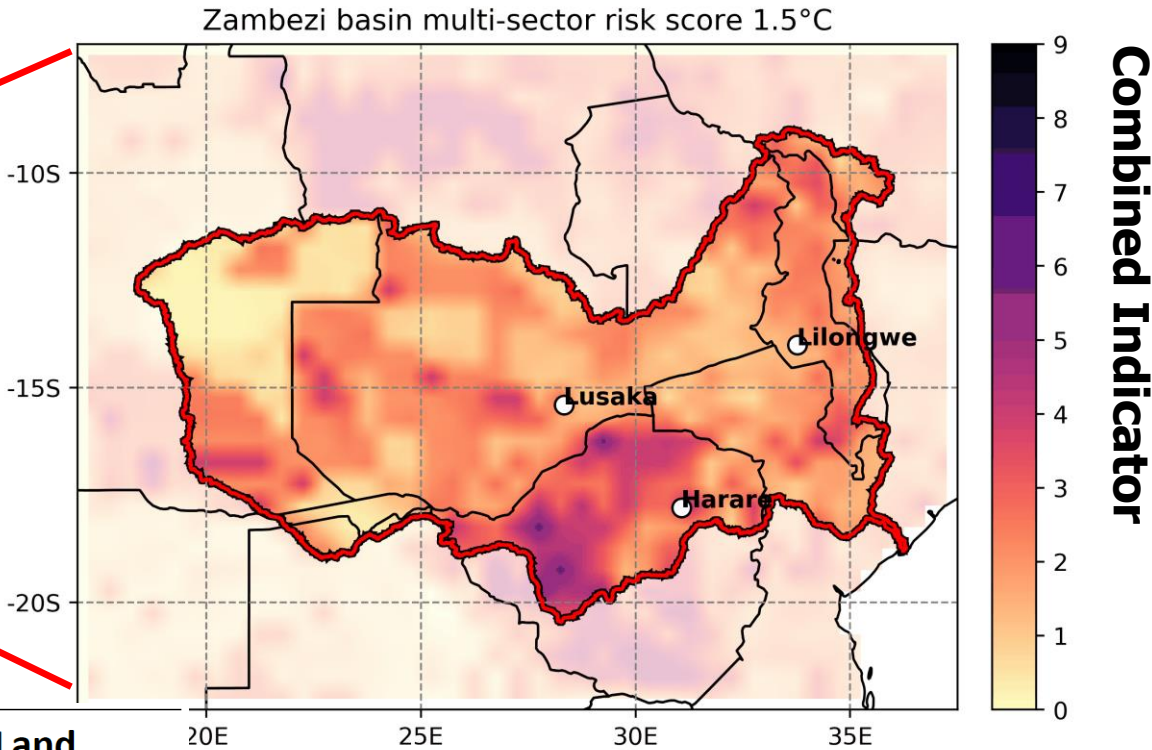
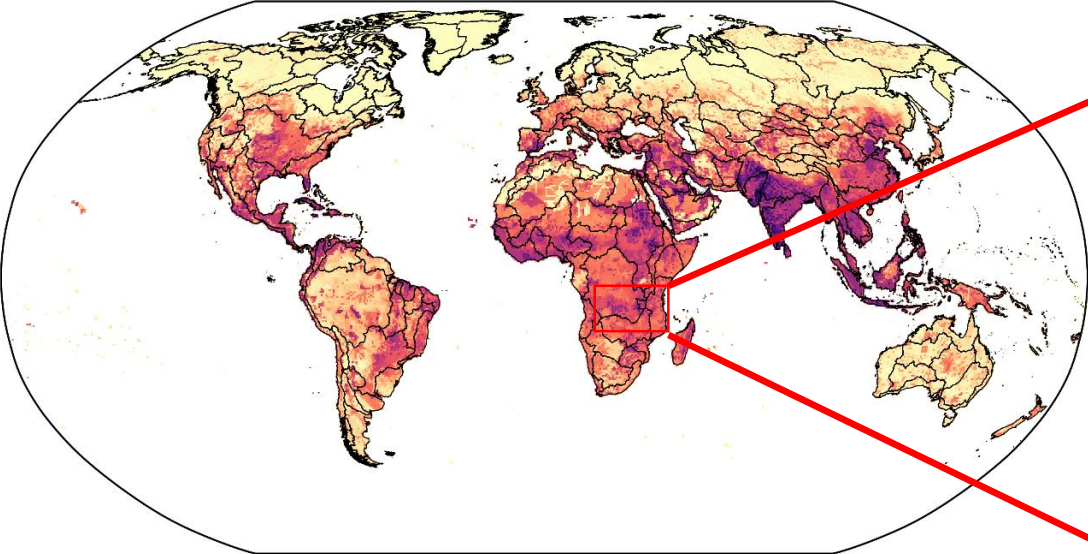
Integrated Solutions for Water, Energy and Land



NEXUS THINKING



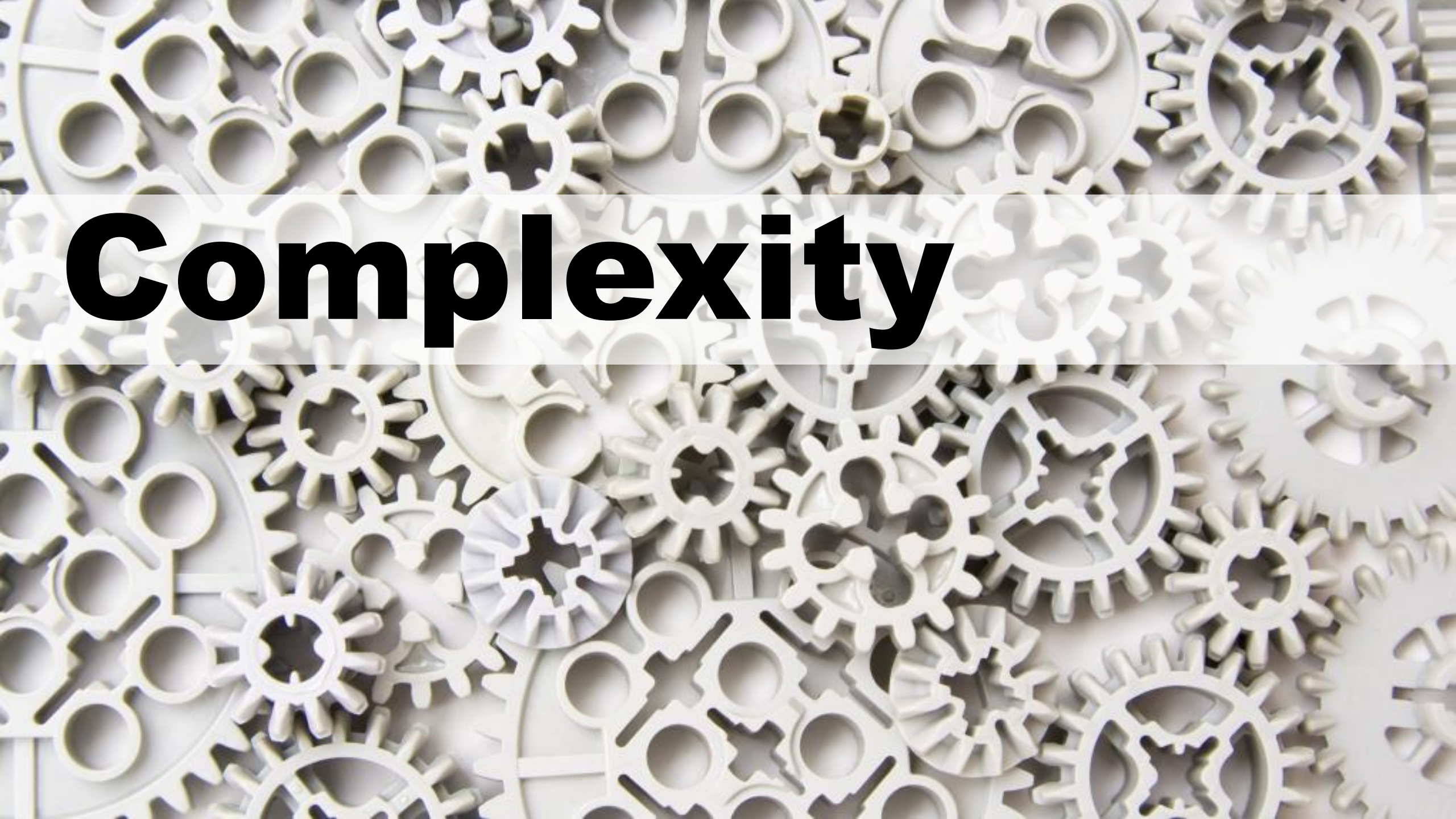
Global analysis of nexus hotspots



Indicators

Water	Energy	Land
Water stress index	Clean cooking access	Crop yield change
Non-renewable GW abstraction	Heat event exposure	Environmental flow exploitation
Drought intensity	Cooling demand growth	Habitat degradation
Peak flows risk	Hydroclimate risk to power	Nitrogen leaching
Seasonality		
Inter-annual variability	Population and income level projections	

Byers et al. 2018



Complexity

FORECAST ...

... fails in complex realities



**PHILOSOPHICAL
TRANSACTIONS**

— OF —
**THE ROYAL
SOCIETY** **A**

rsta.royalsocietypublishing.org

Water security in one blue planet: twenty-first century policy challenges for science

D. Grey^{1,2}, D. Garrick^{3,4}, D. Blackmore^{5,6}, J. Kelman^{7,8},
M. Muller^{9,10,11} and C. Sadoff^{5,12}

higher

investments:
information
institutions
infrastructure

(I)

water secure

Eastern North America
Northern Europe

(III)

fragile water security

Southeast Australia, Western North America,
Japan, Israel, Southern Europe, South Africa

Latin America

(IV)

water insecure:
low-level equilibrium trap

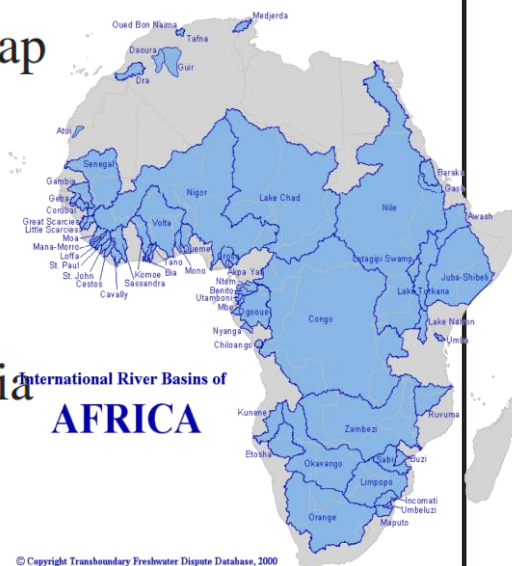
MENA Region

(II)

fragile water security

Russia
Northern China

Southern China
South and Southeast Asia
Sub-Saharan Africa



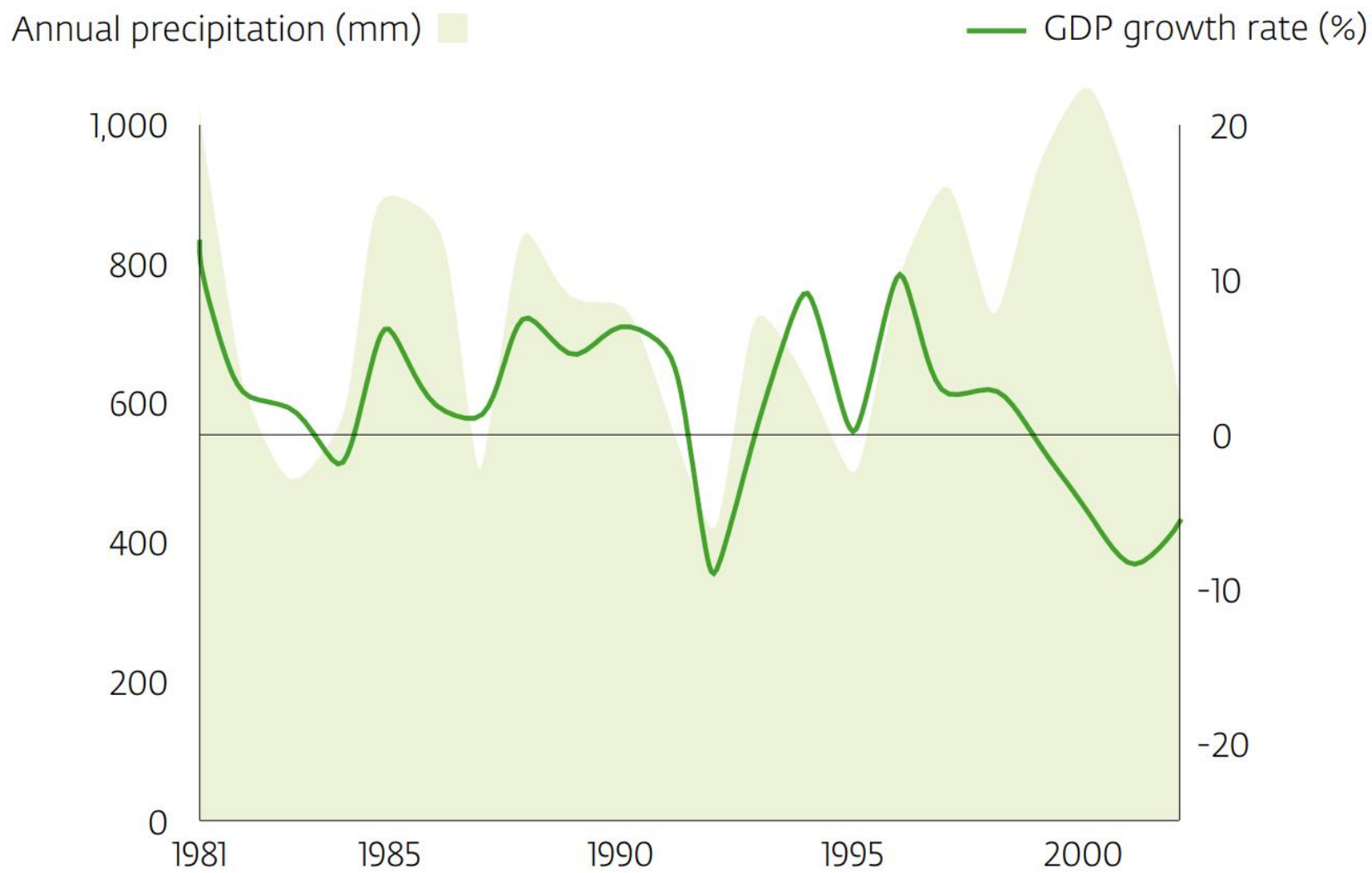
© Copyright Transboundary Freshwater Dispute Database, 2000

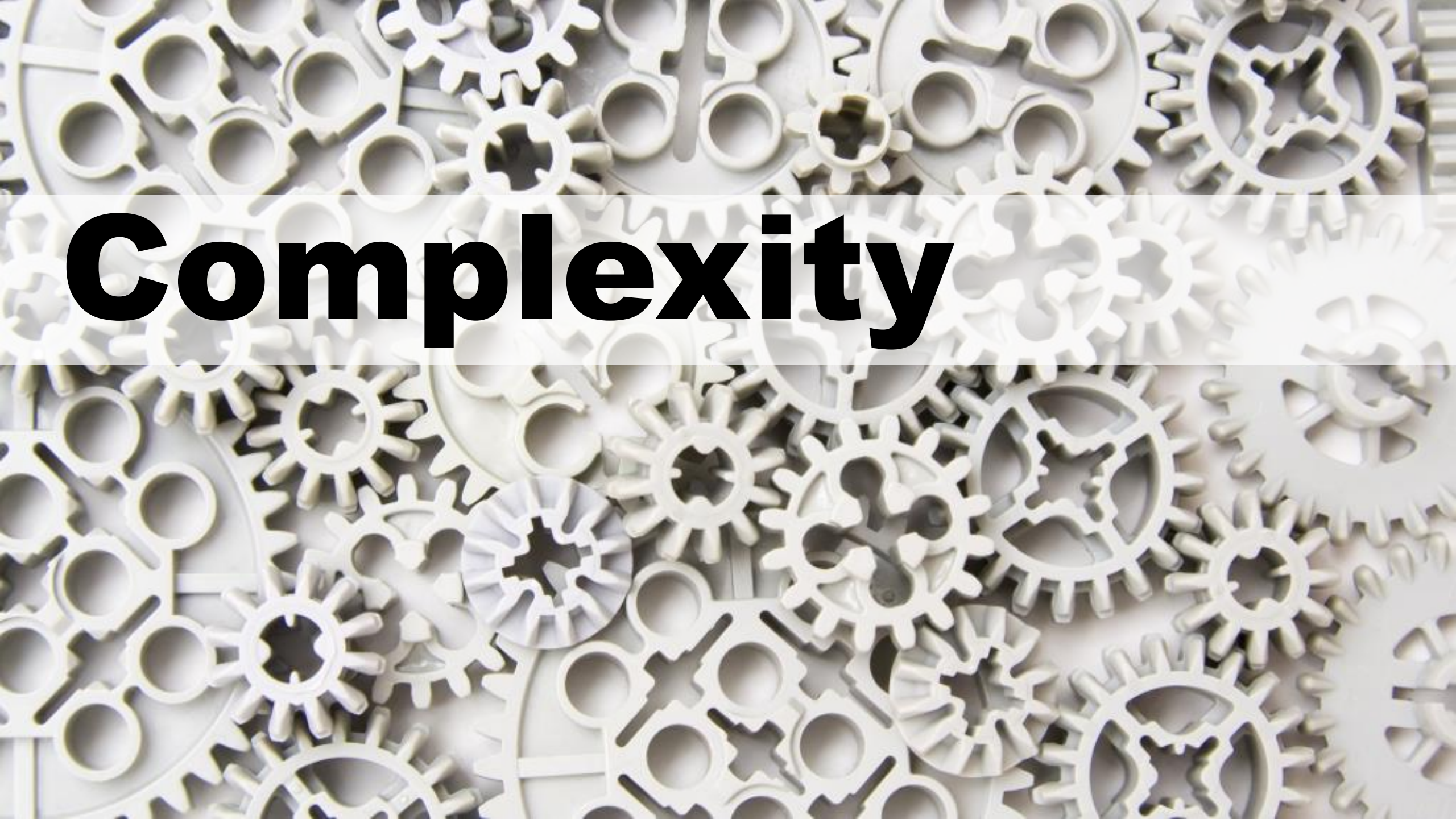
lower

hydrological complexity

higher

Correlation between GDP and rainfall in Zimbabwe



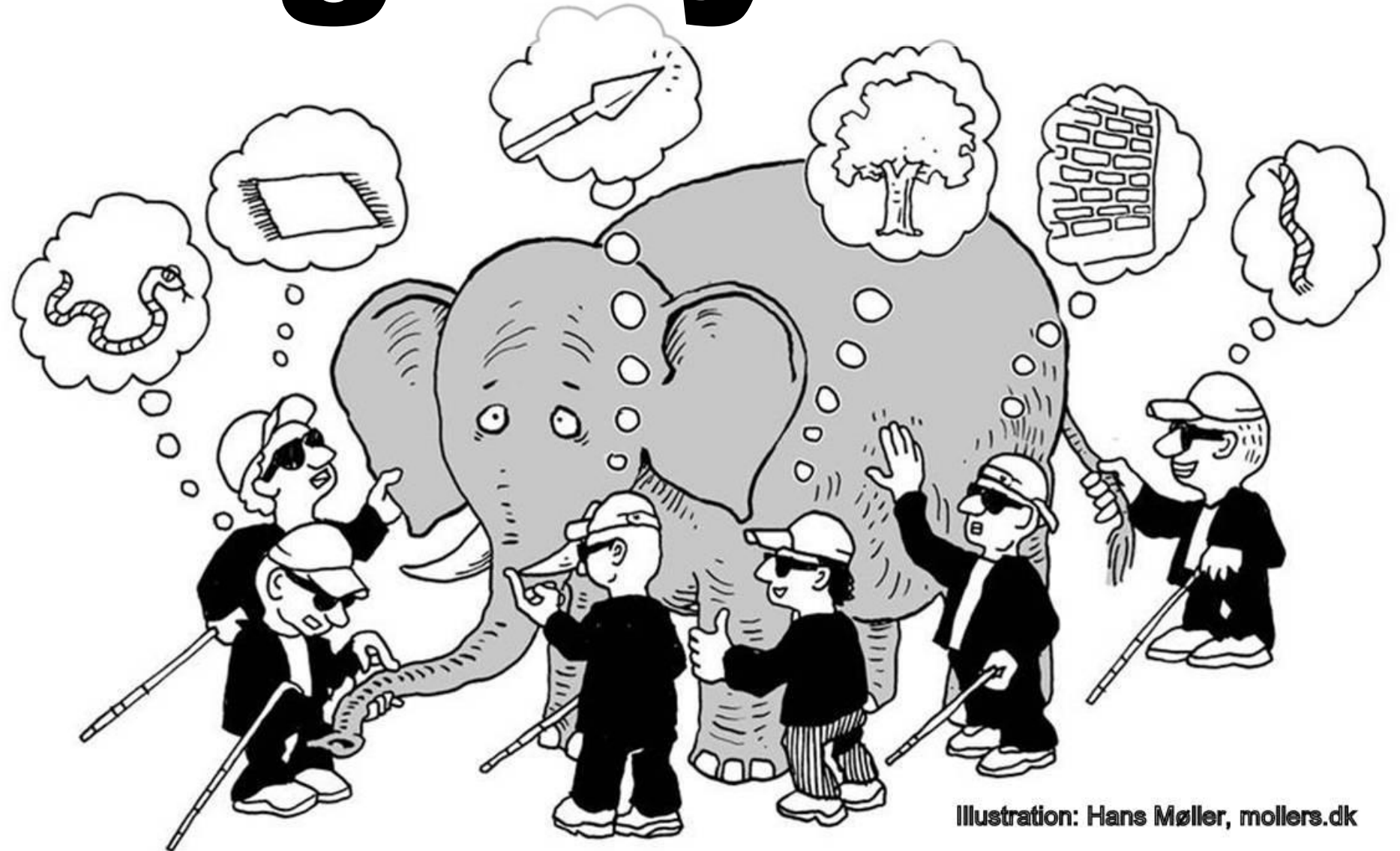


Complexity



Uncertainty



Ambiguity



Chimamanda Ngozi Adichie:

The danger of a single story

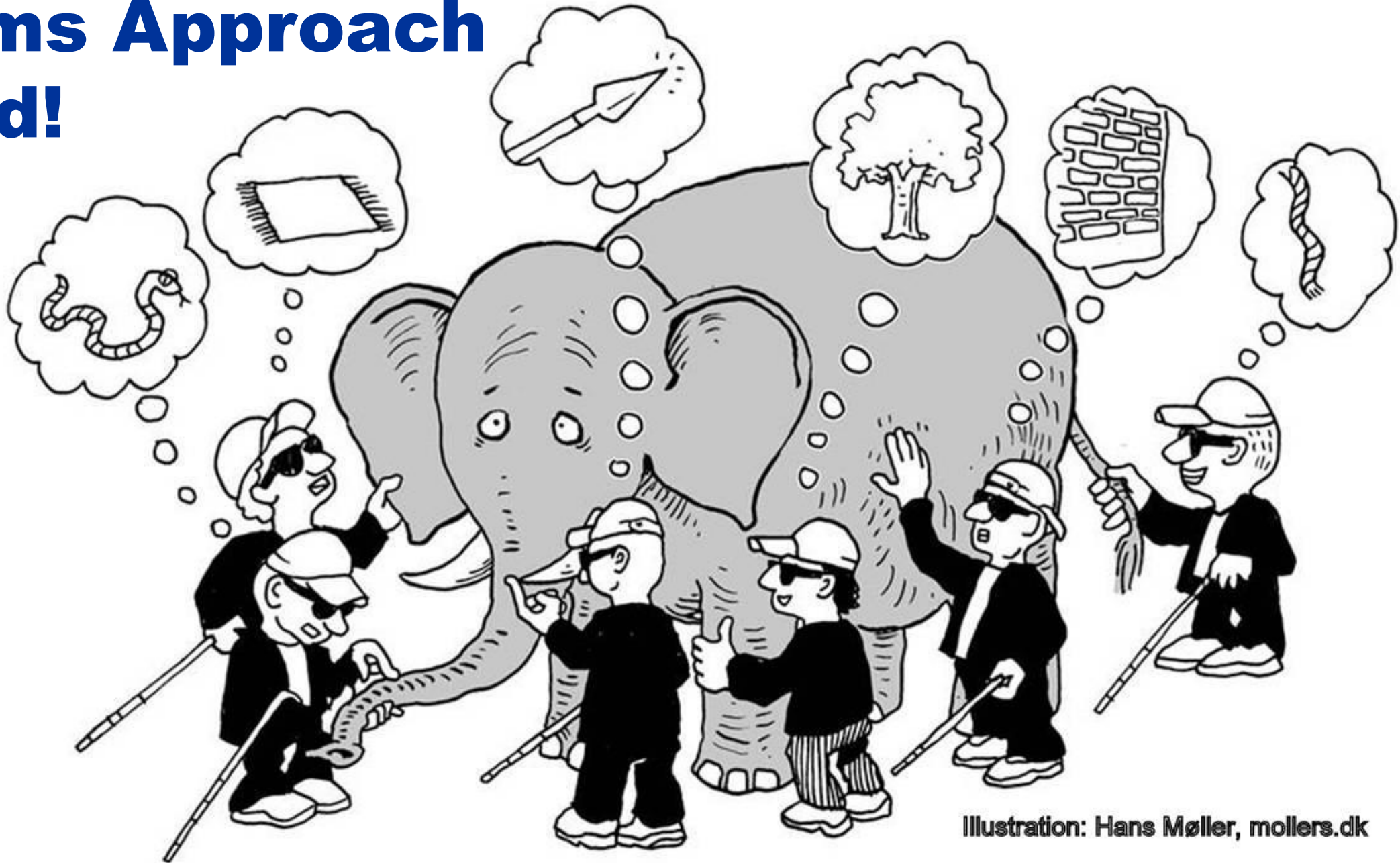
TEDGlobal 2009 · 18:49 · Filmed Jul 2009

 45 subtitle languages 

 [View interactive transcript](#)



Systems Approach needed!





SERIOUS
GAMES

STRATEGIC
SIMULATIONS

SCENARIOS

SERIOUS
GAMES

STRATEGIC
SIMULATIONS

SCENARIOS

Simulation







“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**.”



Tell me and I forget,
show me and I may remember,
involve me and I will understand.

Xunzi



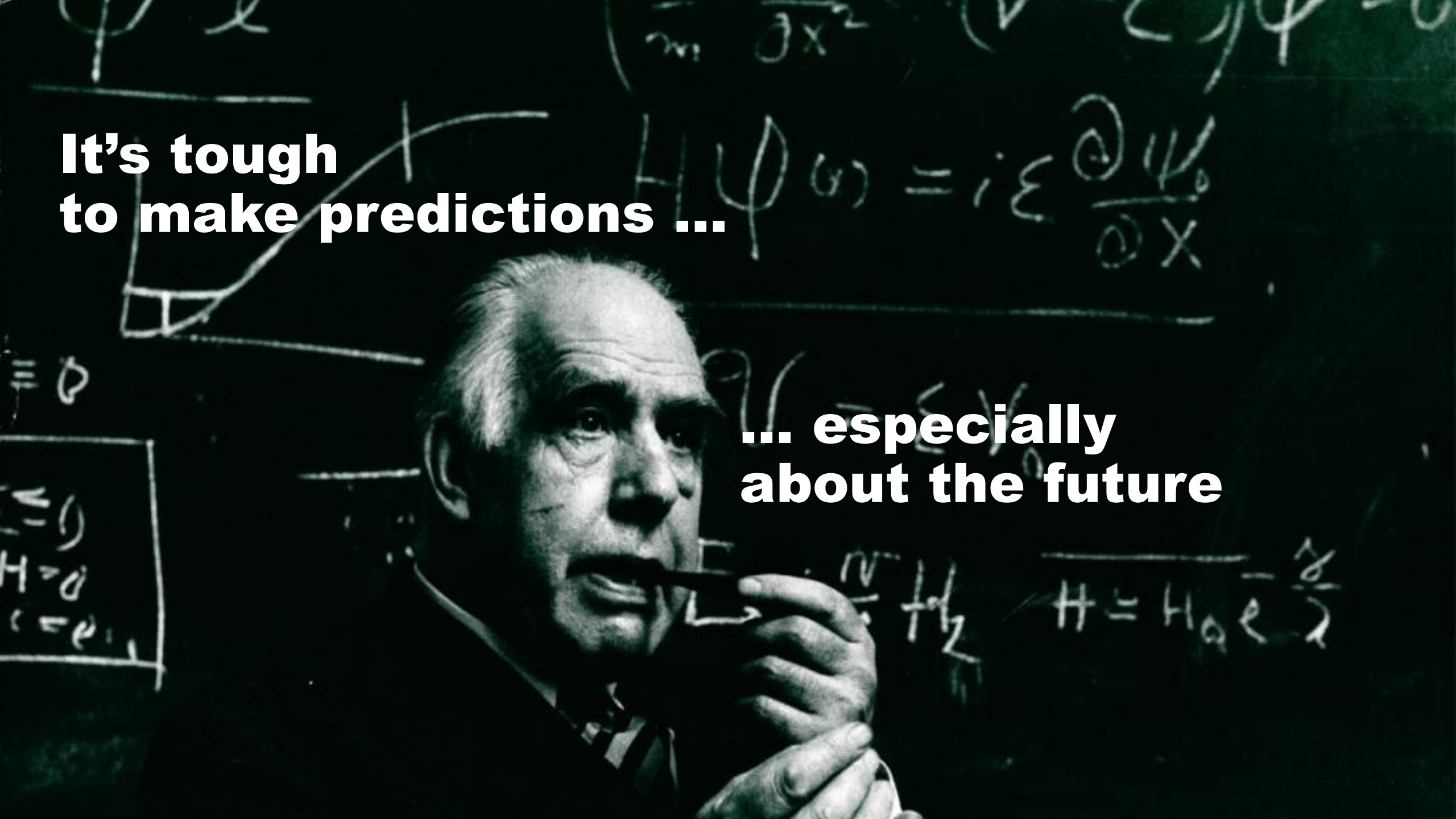
SERIOUS
GAMES

STRATEGIC
SIMULATIONS

SCENARIOS

**It's tough
to make predictions ...**

**... especially
about the future**



TODAY'S SCENARIOS TEAM CONFRONTS
NEW CHALLENGES IN A WORLD SHAKEN BY
FRESH ECONOMIC AND POLITICAL TURMOIL



1960s

A PIONEERING TEAM OF
ECONOMISTS, ENGINEERS
AND SCIENTISTS HAD
STARTED WORK ON SHELL'S
FIRST SCENARIOS

1972/3

THE TEAM HAD SHARED
THESE EARLY SCENARIOS
WITH SHELL'S MANAGEMENT,
DARING THEM TO THINK THE
UNTHINKABLE: WHAT IF THE
WORLD FACED AN OIL CRISIS?

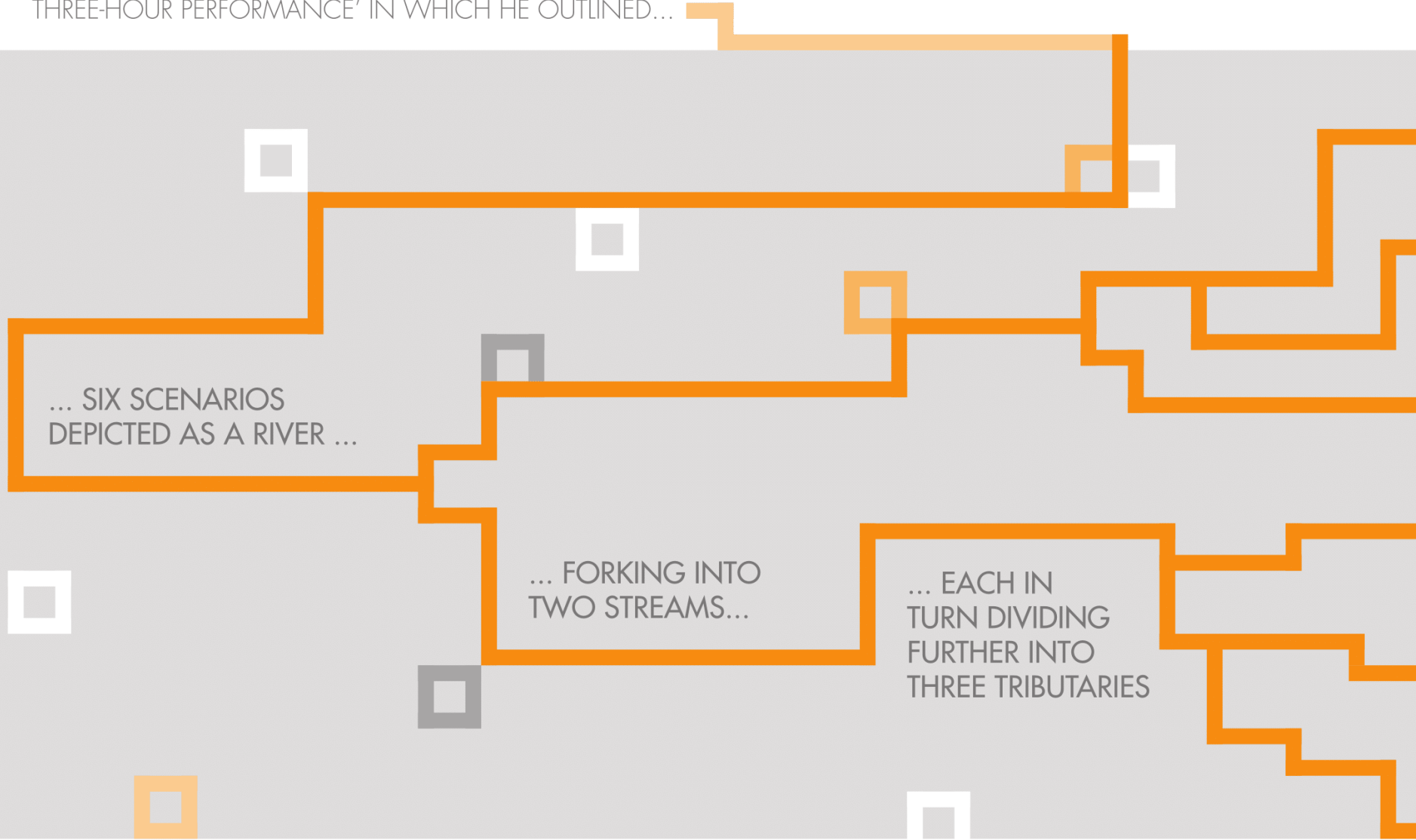
2013+

THE NEW LENS SCENARIOS
FOCUS ON AREAS THAT
WILL BE SIGNIFICANT IN THE
DEVELOPMENT OF ENERGY
AND ENVIRONMENTAL
SYSTEMS IN THE 21ST CENTURY

In 1973,
the global economy
was shocked
by a major oil crisis.

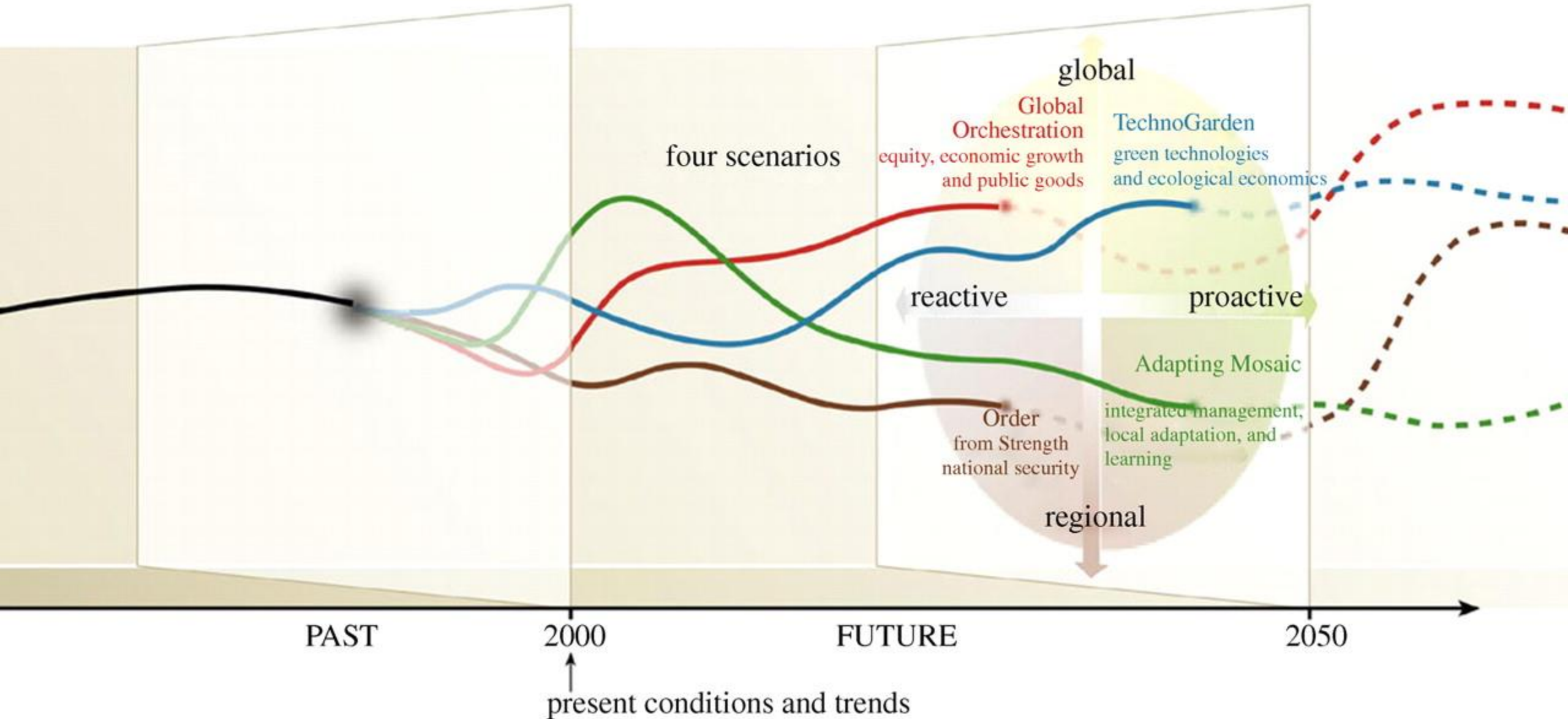
Shell wasn't!

IN SEPTEMBER 1972, HEAD OF SCENARIOS, PIERRE WACK, GAVE WHAT IS RECALLED BY THOSE WHO ATTENDED AS AN 'ENTHRALLING THREE-HOUR PERFORMANCE' IN WHICH HE OUTLINED...



Scenarios enabled Shell to successfully adapt to unexpected changes.

Example: Millennium Ecosystem Assessment



Scenarios

Consistent and coherent descriptions of alternative hypothetical futures that reflect different perspectives on past, present, and future developments, which can serve as a basis for action.

Philippe van Notten

How to bridge the gap?

**Scenario
Developers**

**Scenario
Users**



Global SCENARIOS

e.g. IPCC scenarios (SSP narratives)

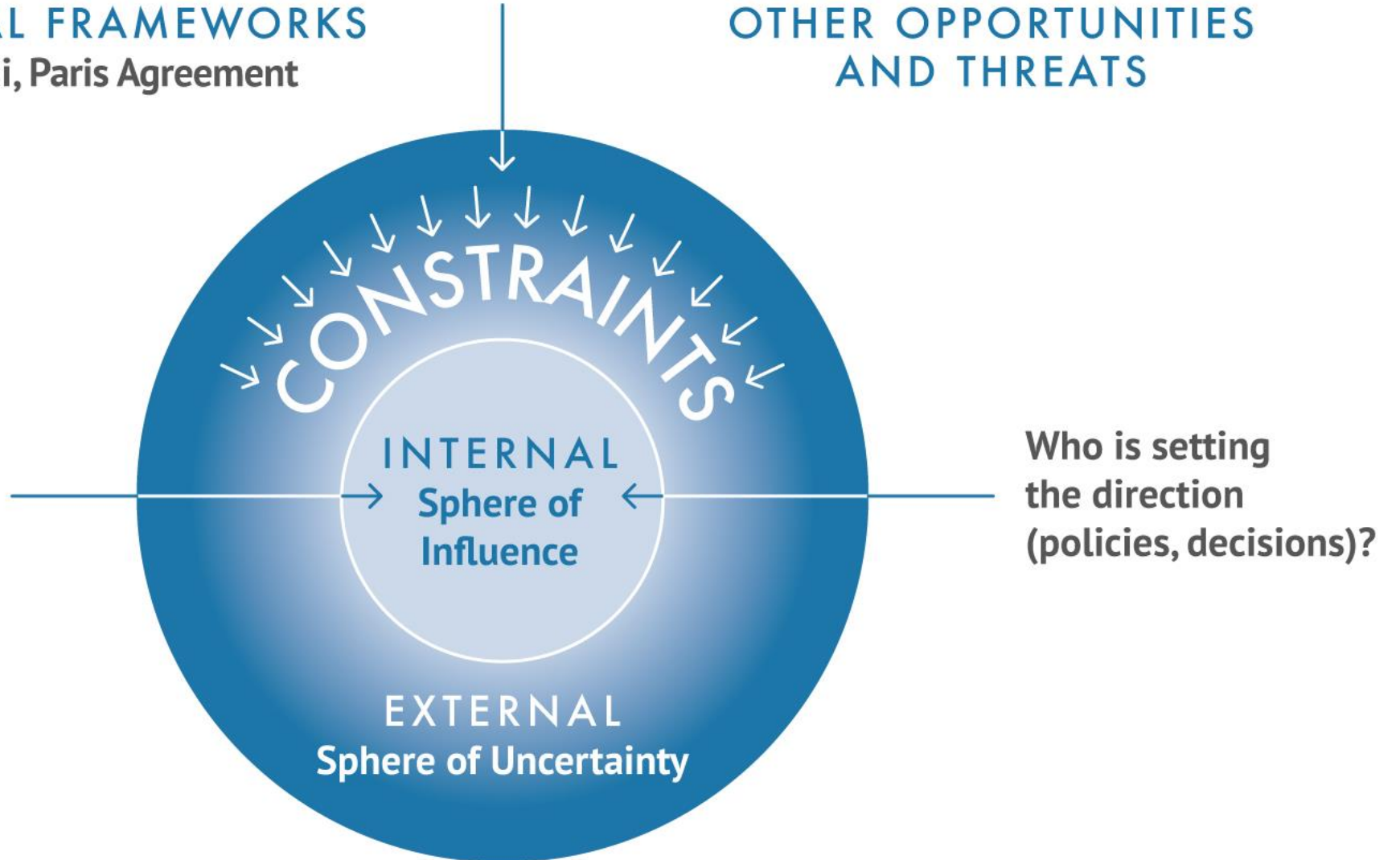
INTERNATIONAL FRAMEWORKS

e.g. SDGs, Sendai, Paris Agreement

OTHER OPPORTUNITIES
AND THREATS

Regional
PATHWAYS

plans, visions,
policies, strategies



The image features a stylized world map in light blue with white landmasses, enclosed in a black oval border. Overlaid on the map is a detailed, topographical-style map of a specific region, likely a mountain range, showing yellow and green terrain with red and blue lines representing roads and waterways. The text 'EXTERNAL Scenarios' is positioned in the upper left, and 'INTERNAL Pathways, Strategies' is positioned in the lower right, both in bold black font.

EXTERNAL *Scenarios*

INTERNAL
Pathways,
Strategies

Scenario Elements



Challenges



Trade-offs



Solutions

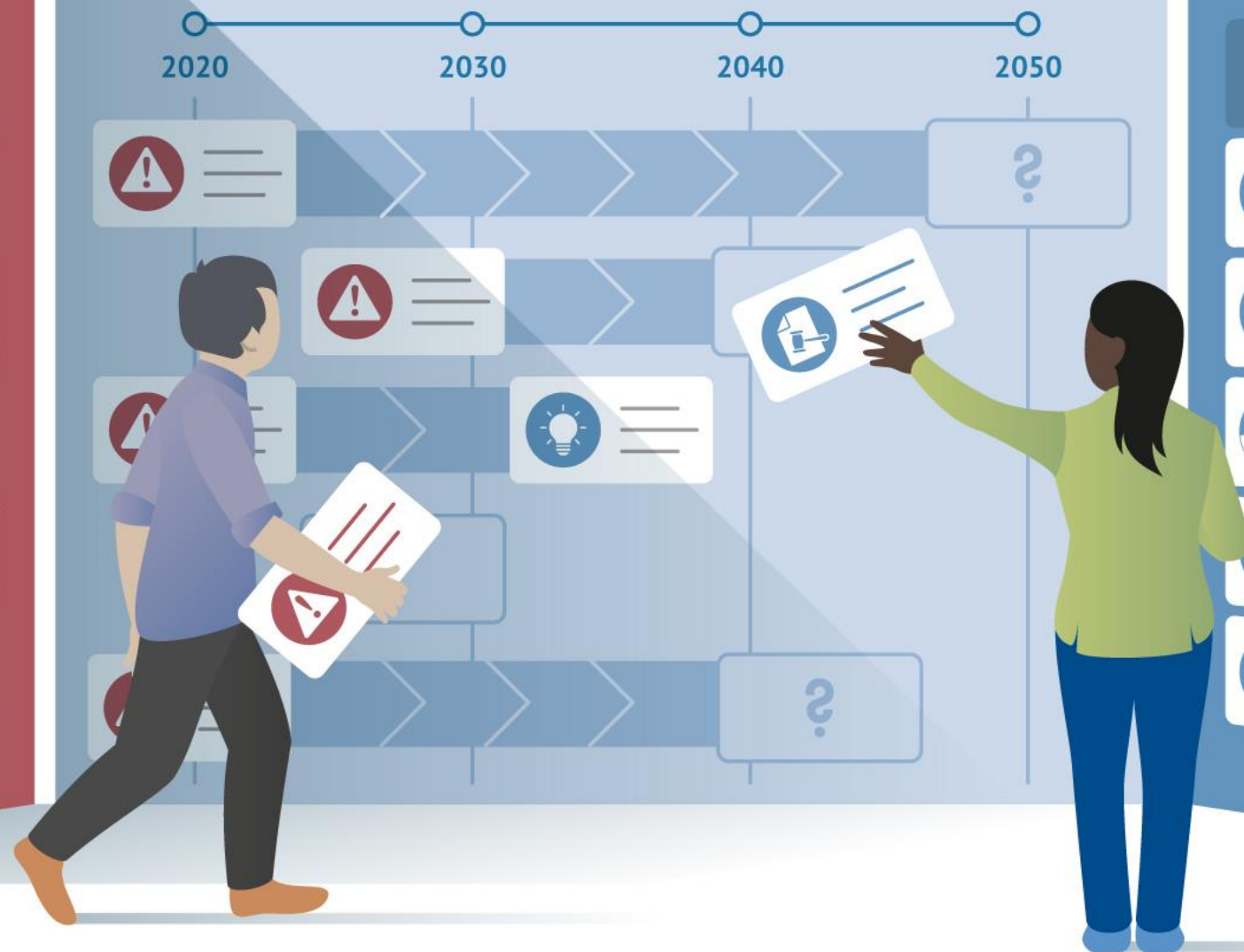


Synergies

CHALLENGES

PATHWAYS TIMELINE

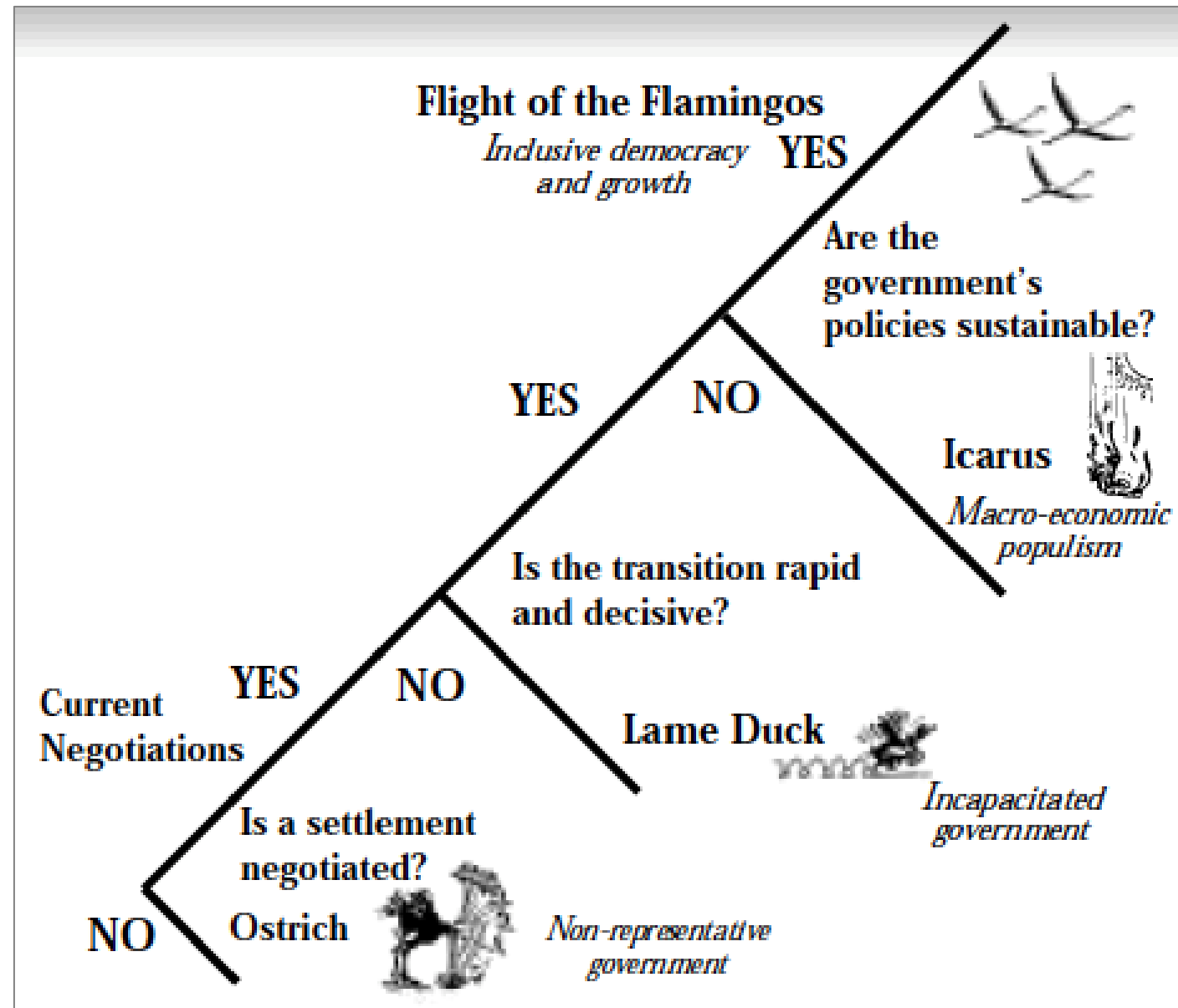
SOLUTIONS





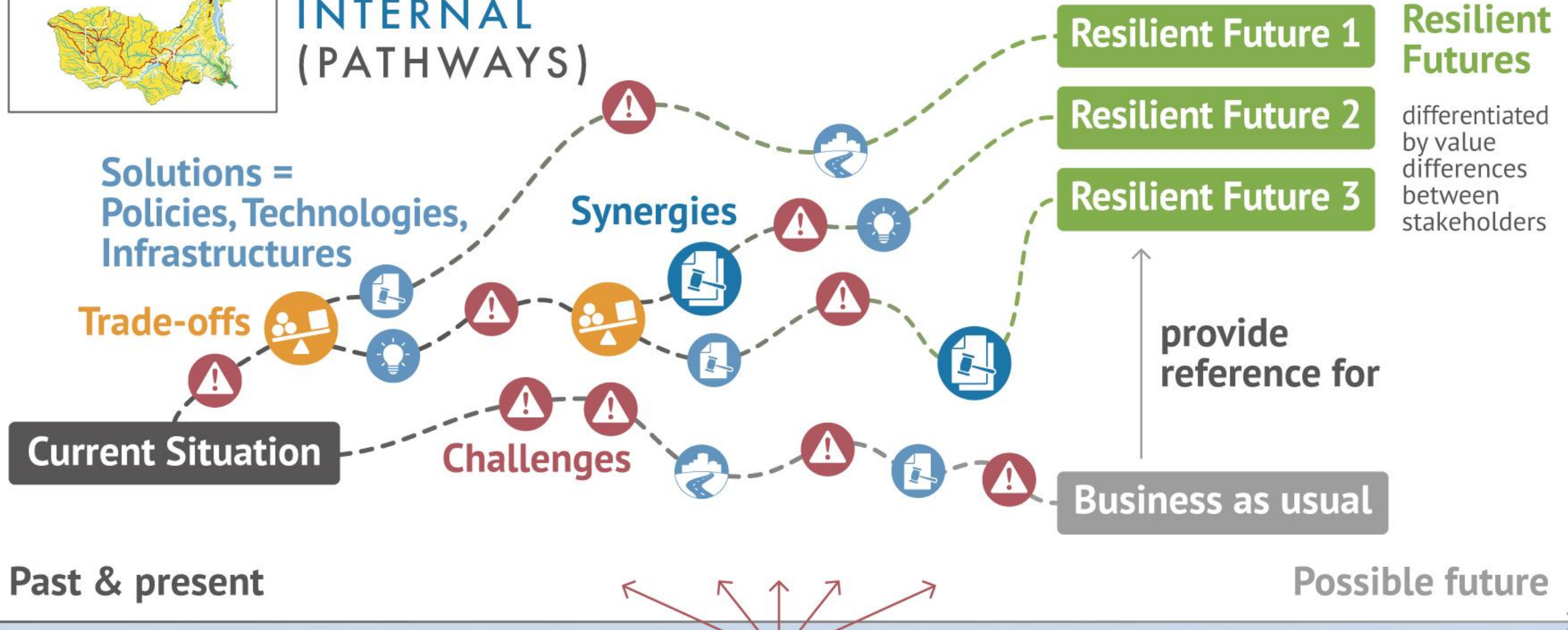
Trade-offs determine Pathways

Example:
South Africa
political futures:
The Mont Fleur
Scenarios
1991-1992





INTERNAL (PATHWAYS)



Resilient Futures

differentiated
by value
differences
between
stakeholders

Constraints

Input based on SSPs



EXTERNAL (SCENARIOS)

Risks



SERIOUS
GAMES

STRATEGIC
SIMULATIONS

SCENARIOS

PROBLEM



DIFFERENT PERSPECTIVES



COMMUNICATION



C
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CONSENSUS



COMMITMENT to ACTION



Application of the Strategic Simulation

**A river
shared between
four conflicted
countries**









Zambezi River Basin

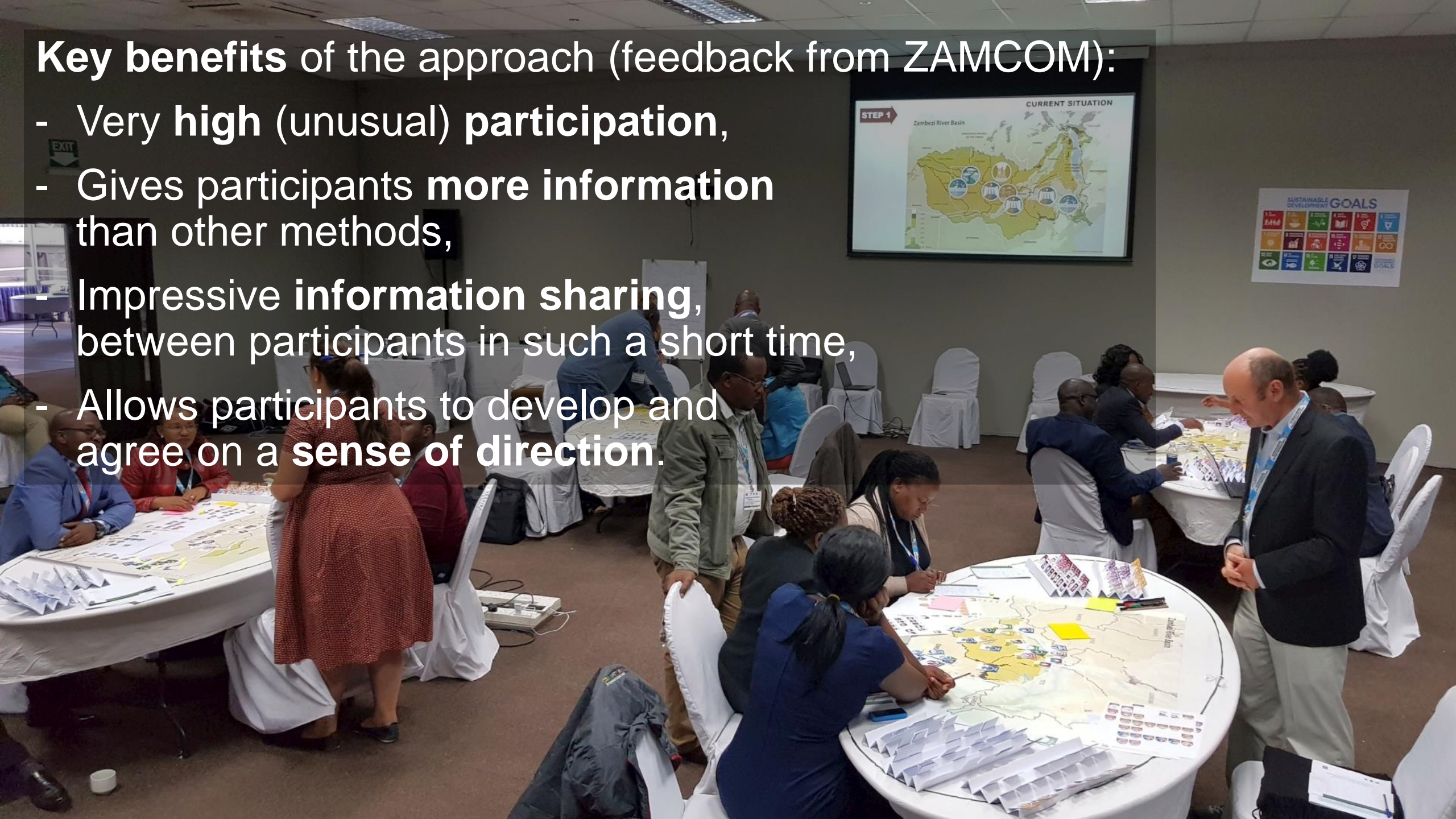


**Application of
the Strategic
Simulation**



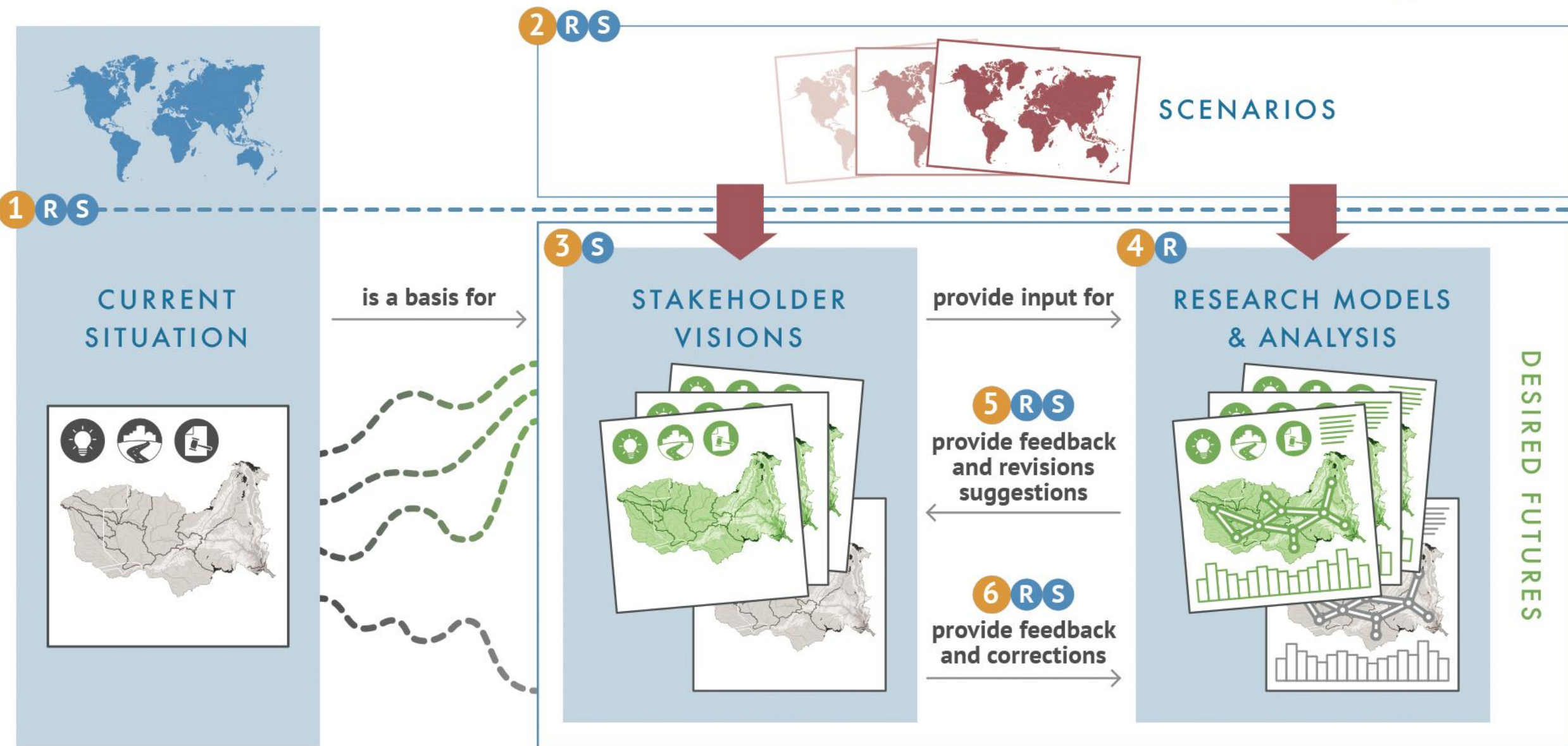
Key benefits of the approach (feedback from ZAMCOM):

- 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.



“The workshop was an eye opener to linking practical knowledge to available science”

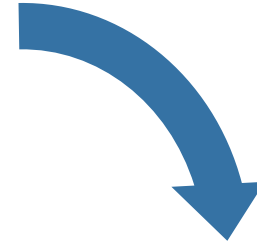




PROBLEM



**DIFFERENT
PERSPECTIVES**



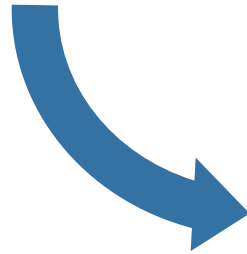
COMMUNICATION



COMPLEXITY



CREATIVITY



CONSENSUS



COMMITMENT to ACTION

