UN 2023 WATER CONFERENCE

NEW YORK 22–24 MARCH 2023

Nature-based Solutions for Water and Peace

the WEATHER MAKERS holistic engineering

The Hague Centre for Strategic Studies

TAMATTA

Anthesis

Nature-based Solutions for Water and Peace

A landscape-scale perspective

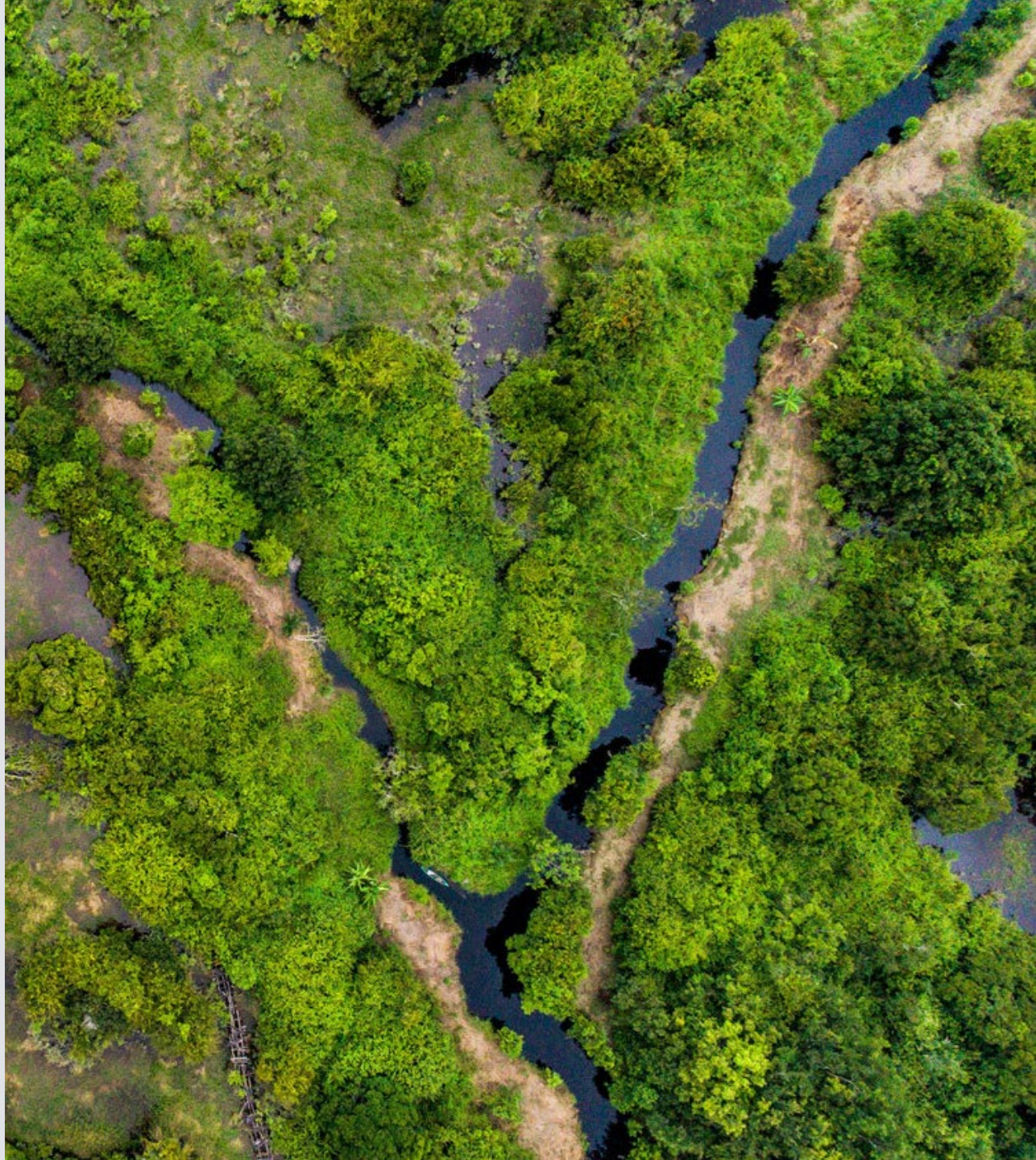
Juliette Kool
Geospatial Analyst
The Weather Makers

Changing climate

Changing water cycles

Insecurity

meet the needs of future world populations
in the backdrop of depleting natural resources
and a
changing climate

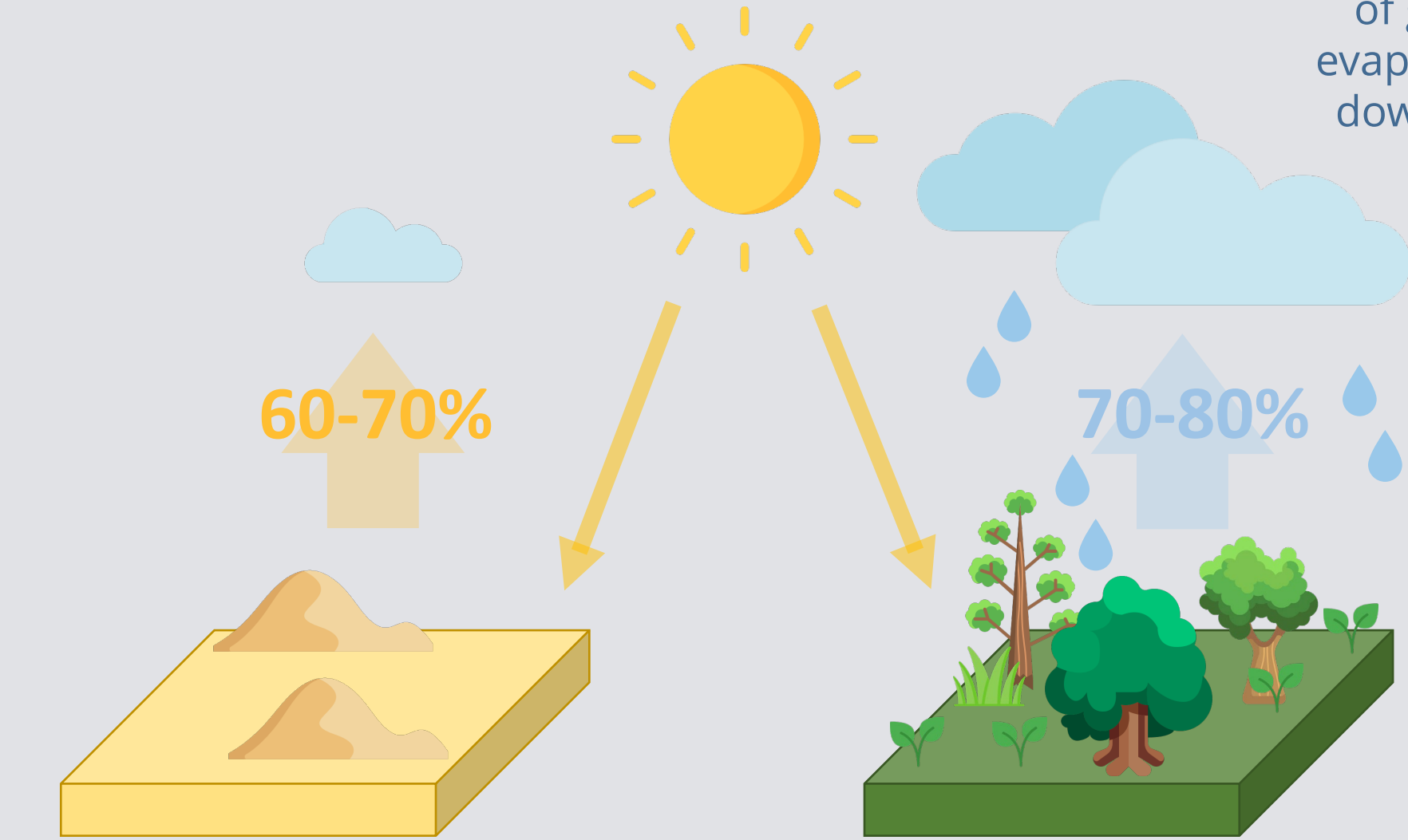


Humans have altered landscapes and the climate over thousands of years

Appearance of first humans	Homo sapiens leave Africa	Megafauna extinction	Agricultural revolution	The Industrial revolution	The Great Acceleration
2.8 Myr	100,000 yr	*50,000 yr*	*10,000 yr*	*1760*	*1950*

Land-atmosphere interactions

70 %
of global land evaporation rains down over land



strong sensible heat flux
warm, dry

high evapotranspiration
cool, wet

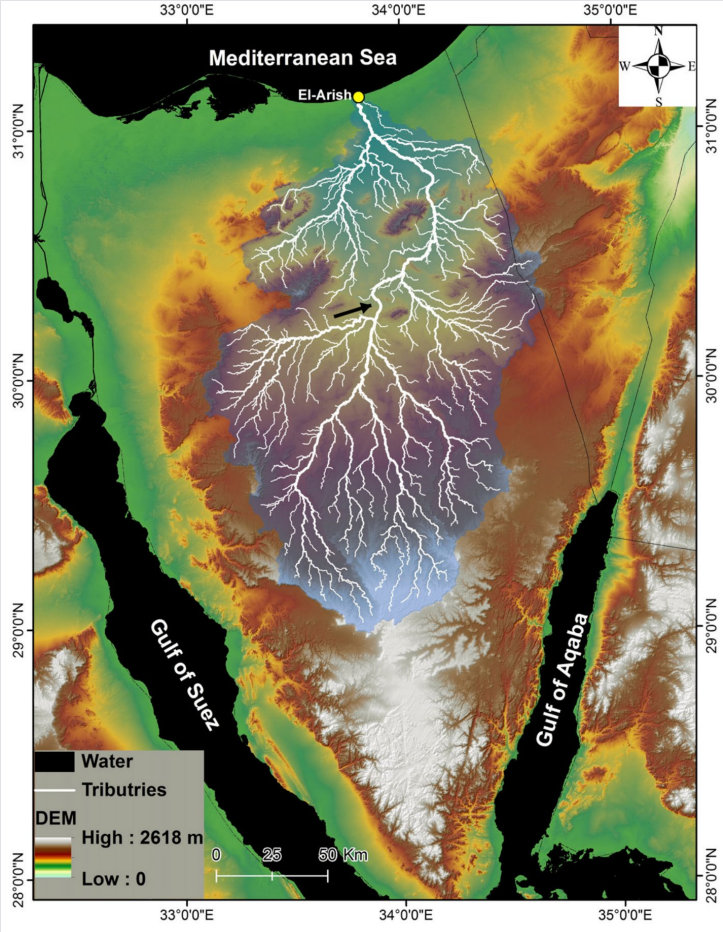
The state of the biosphere plays a role in how fresh water is distributed over the globe

We shape the biosphere

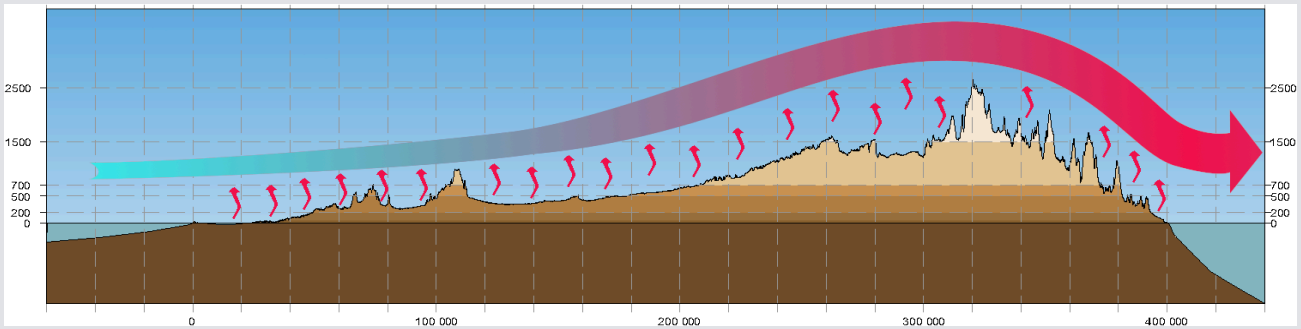
Loess plateau, China

+ 20.25 % local precipitation after afforestation

What if ?


33°0'0"E
34°0'0"E
35°0'0"E
Mediterranean Sea
El-Arish
N
W
E
S
31°0'0"N
30°0'0"N
29°0'0"N
28°0'0"N
Gulf of Suez
Gulf of Aqaba
Water
Tributries
DEM
High : 2618 m
Low : 0
0
25
50 Km

What if ?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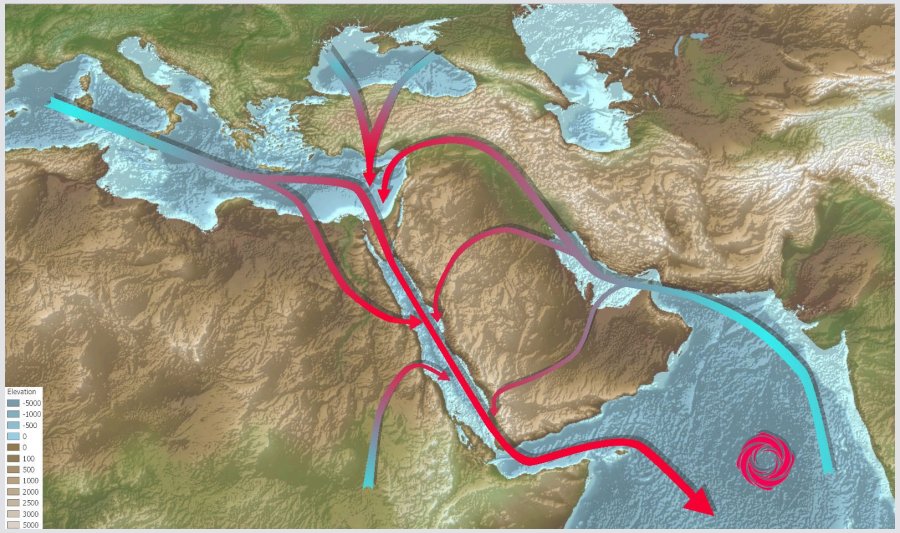

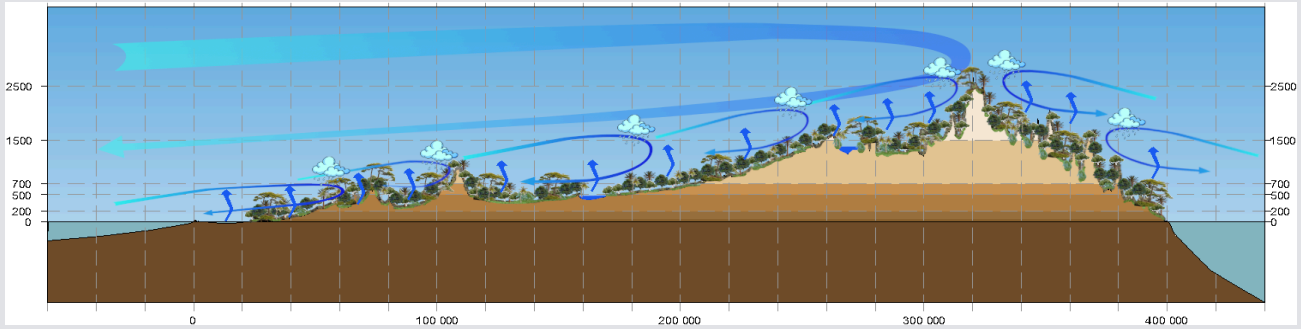
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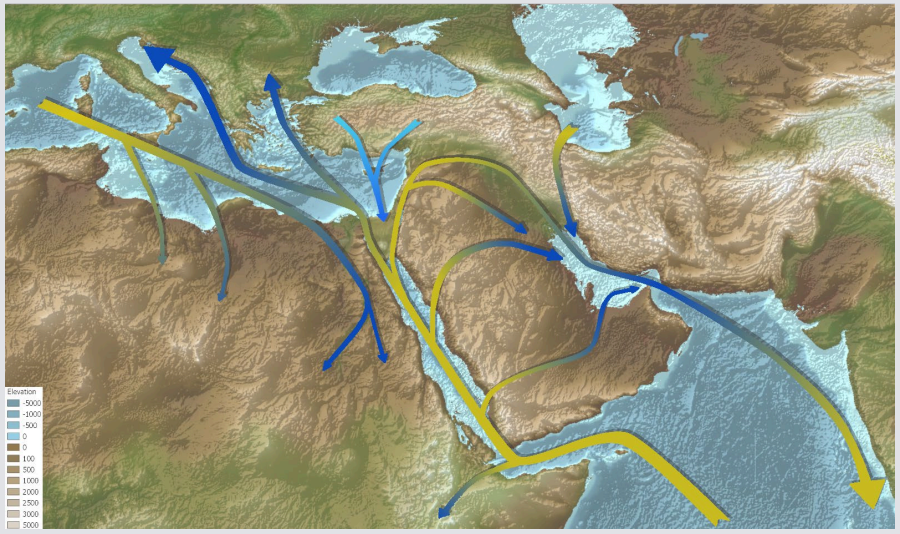


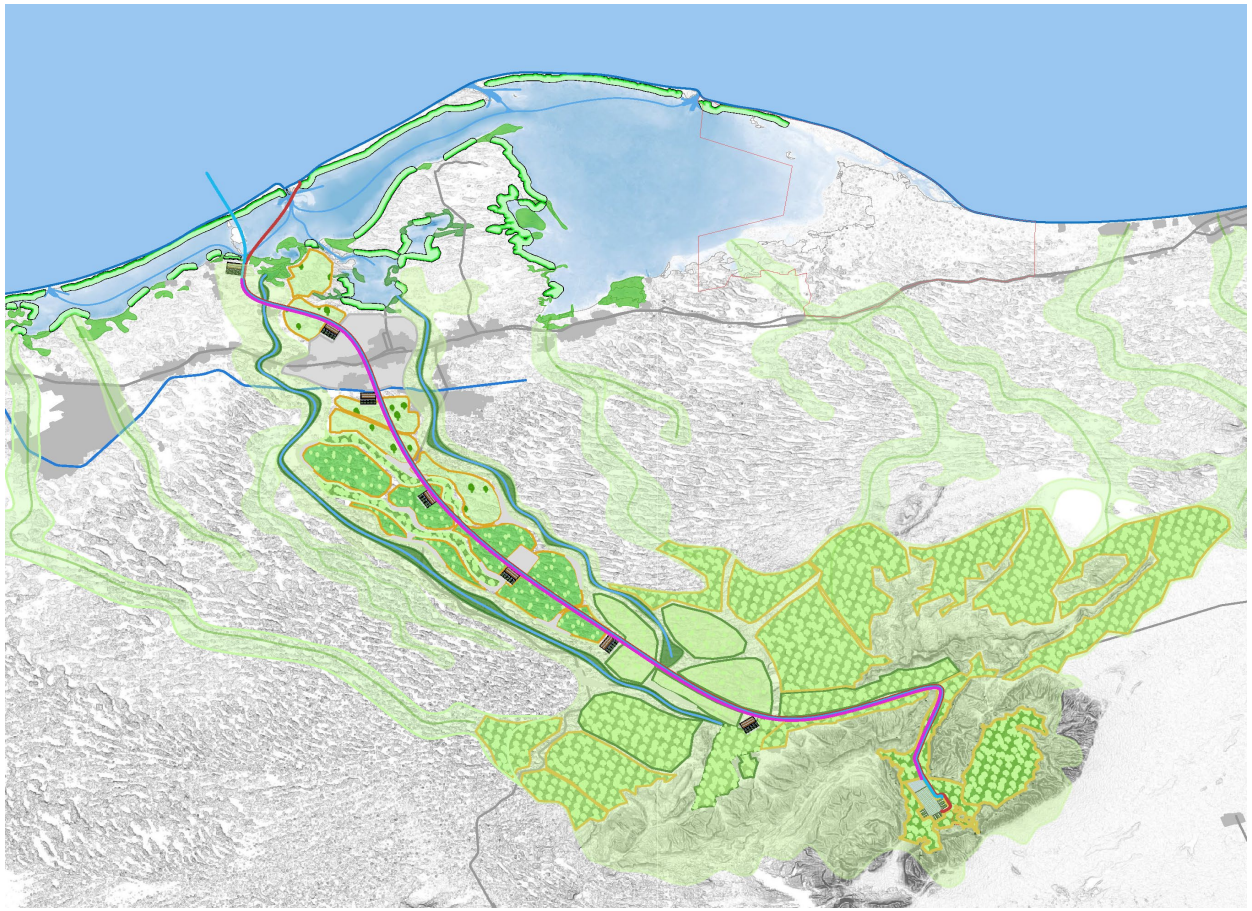
Economic growth *has been* the primary driving force behind land transformation

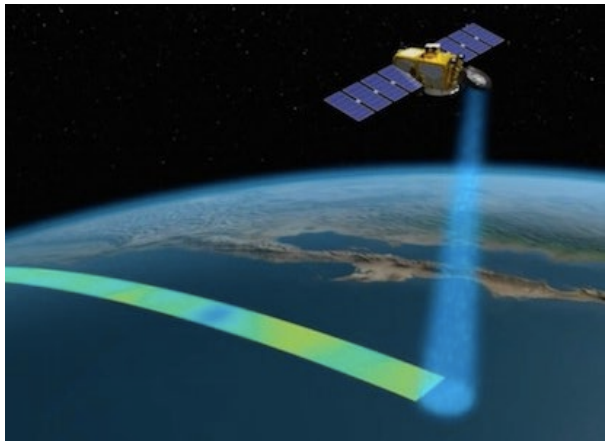
Water cycle restoration *can become* the primary driving force behind land transformation

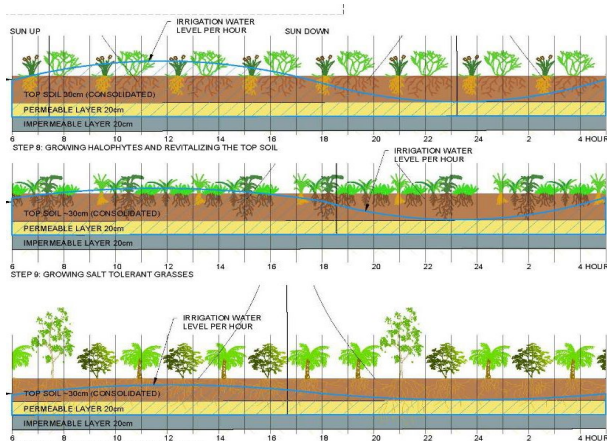
Landscape-scale NbS as a strategy for water cycle restoration

Where and how should we distribute our energy and water resources to produce regenerative ecosystems?

Who plays a role?






SUN UP
IRRIGATION WATER LEVEL PER HOUR
SUN DOWN
TOP SOIL 30cm (CONSOLIDATED)
PERMEABLE LAYER 20cm
IMPERMEABLE LAYER 20cm
6 8 10 12 14 16 18 20 22 24 2 4 HOUR
STEP 8: GROWING HALOPHYTES AND REVITALIZING THE TOP SOIL
IRRIGATION WATER LEVEL PER HOUR
TOP SOIL >30cm (CONSOLIDATED)
PERMEABLE LAYER 20cm
IMPERMEABLE LAYER 20cm
6 8 10 12 14 16 18 20 22 24 2 4 HOUR
STEP 9: GROWING SALT TOLERANT GRASSES
IRRIGATION WATER LEVEL PER HOUR
TOP SOIL >30cm (CONSOLIDATED)
PERMEABLE LAYER 20cm
IMPERMEABLE LAYER 20cm
6 8 10 12 14 16 18 20 22 24 2 4 HOUR

Criteria

- Proactive adaptive approach
- Rigorous interdisciplinary scientific planning merging ecology and atmospheric science (data-driven)
- Landscape scale (support of industry)
- Grounded in indigenous knowledge
- Supported by blended finance and governance structures


Thank you

UN Water Conference, 24 March 2023

Nature-based Solutions for Water and Peace

A security assessment framework

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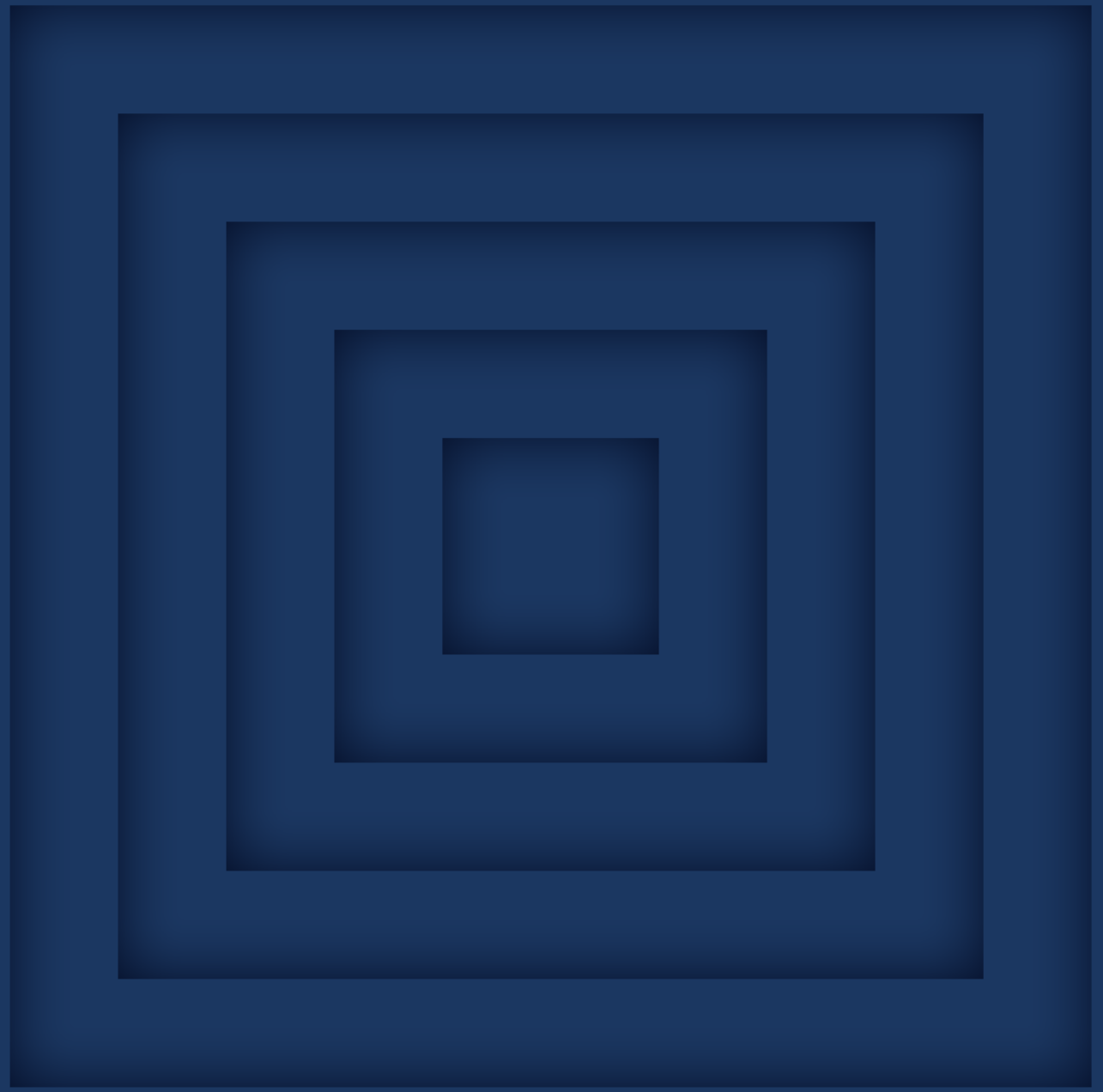
The Hague Centre
for Strategic Studies

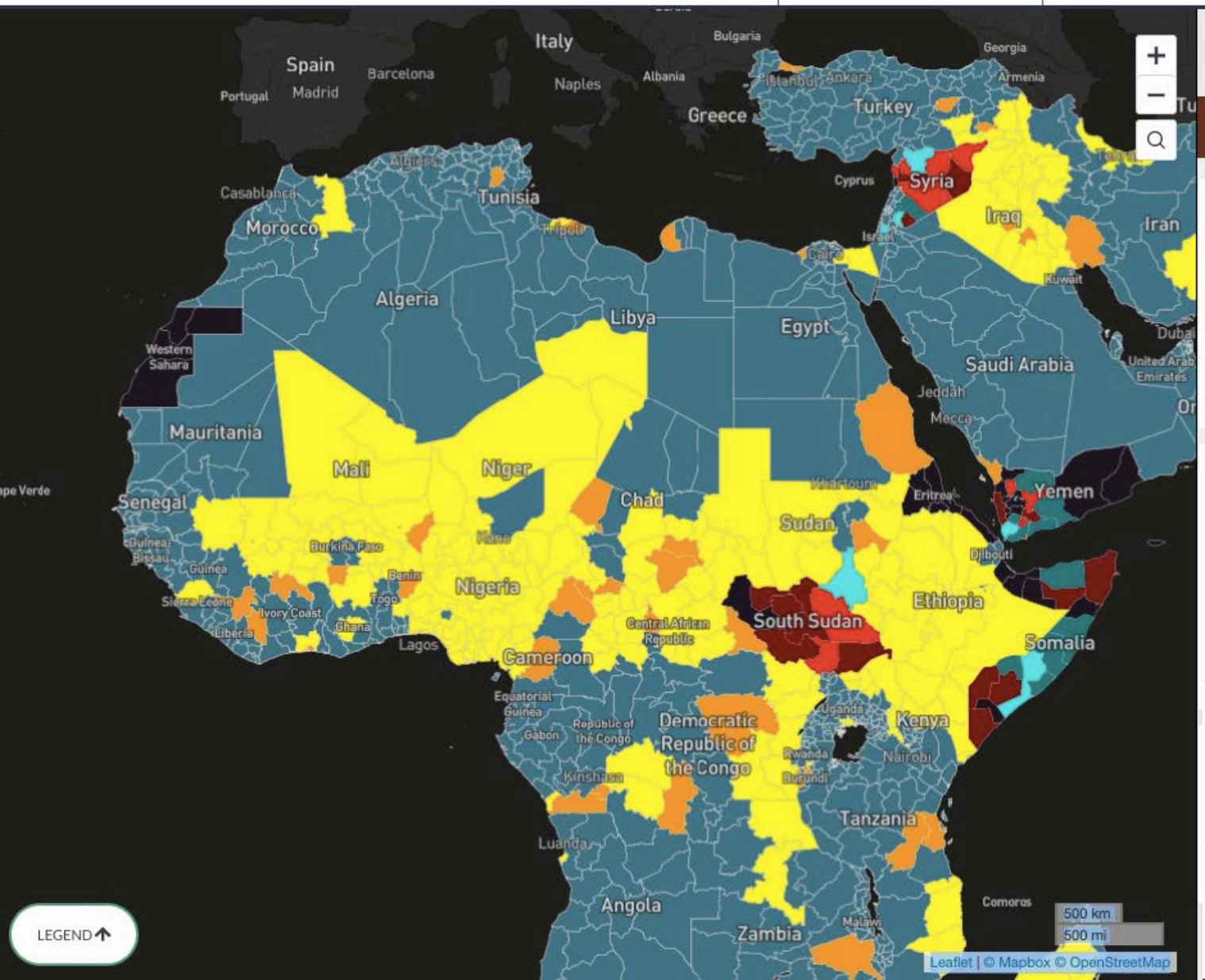
Overview

- WHY – The case for security-proofing Nature-based Solutions and climate adaptation
- HOW – A four-step security assessment framework
- WHAT – Five takeaways for action

WHY

The case for security-proofing Nature-based Solutions and climate adaptation





INVESTIGATION

Add datasets

Click on the map to select a region

Highlight Areas Experiencing Drought

When overlaid with the conflict forecast map, we can use this to highlight areas with both a high risk of conflict and below average precipitation to assist decision makers in prioritizing water-related early action. Learn more

WRI/Deltares/ECMWF, 1 degree, Monthly

Long-term Conflict Forecast

Viewing

LONG-TERM CONFLICT FORECAST: NOVEMBER 2022- OCTOBER 2023

- Ongoing Conflict
- Emerging Conflict
- Below Violent Conflict Threshold

SHORT-TERM CONFLICT FORECAST: DIRECTION (CHANGE FROM NOV-DEC 2022 TO JAN-FEB 2023)

Extreme decrease | Moderate decrease | Slight decrease | No change | Slight increase | Moderate increase | Extreme increase

SHORT-TERM CONFLICT FORECAST: INTENSITY (NUMBER OF CONFLICT EVENTS JAN-FEB 2023)

0 | <10 | <25 | <50 | <75 | <100 | >100

HOW

A four-step security assessment framework

1. ANALYSE: Identify climate-conflict pathways

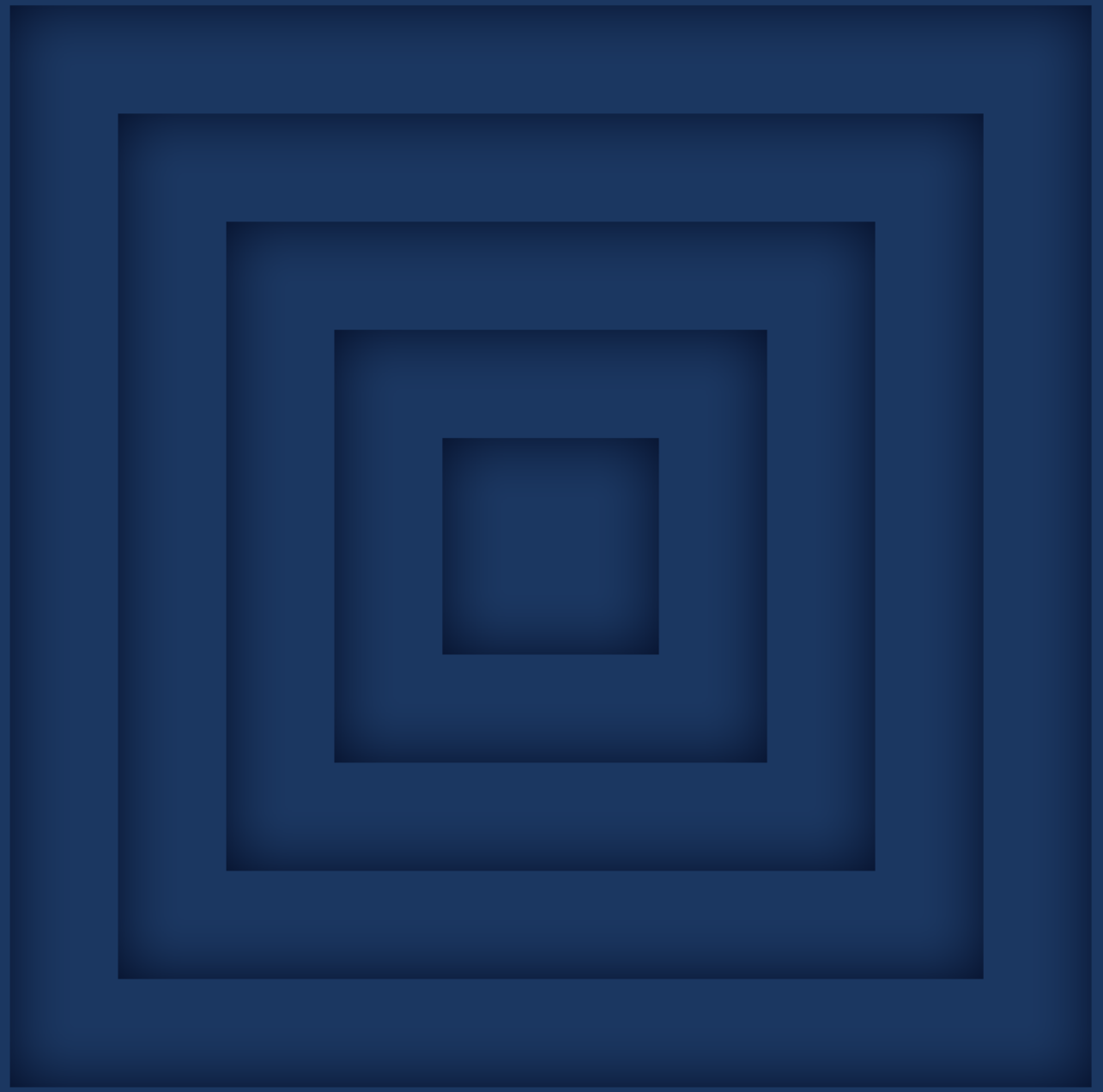
2. ANTICIPATE: Develop targeted foresight and early warning systems

3. MOBILISE: Design and initiate a multi-level stakeholder engagement strategy

4. MITIGATE: Support capacity development, dialogue facilitation and decision making

Step 1 - ANALYSE

Identify climate-conflict pathways



7 high-level climate-conflict pathways

#	Pathway description	
1	Resource Scarcity and Pastoralist Conflict	Changes in temperature and precipitation force pastoralist groups to alter their transhumance routes, which increases resource competition between different groups, defies traditional customary regulations, and increases conflict risk.
2	Resource Scarcity and Inter-Communal Violence	Climate change-induced scarcity of water, food, and land resources, in combination with social, political, geographic, and economic variables, can trigger inter-communal tensions.
3	Climate change, Rural-Urban Migration, and Social Unrest	Climate change can influence the decision to migrate from rural to urban areas, which can spark social unrest, through increased resource competition, feelings of relative deprivation, and inter-cultural clashes.
4	Climate Change and Non-State Armed Groups	Climate change in interaction with state fragility and livelihood deterioration can contribute to the emergence and expansion of non-state armed groups (NSAG), and related conflict and insecurity.
5	Climate Change, Mitigation, Adaptation and Exploitation	Climate change policies can trigger political exploitation and marginalization of groups, aggravating existing grievances and tensions.
6	Natural Hazards, Power Vacuums, and Fragility	Climate hazards can provoke a window of opportunity for violent and non-violent opposition against state authority, through undermining state capacity and exacerbating social vulnerability.
7	Disputes over transboundary (water) resources cascade into intra- or interstate conflict	Climate change can foster tensions over transboundary resources in three main ways: 1) water scarcity raises tensions over transboundary freshwater resources; 2) temperature increases create a new frontier for disputes in the Arctic; 3) diplomatic disputes over climate mitigation measures and responsibility.

Expanding on pathways has tangible benefits

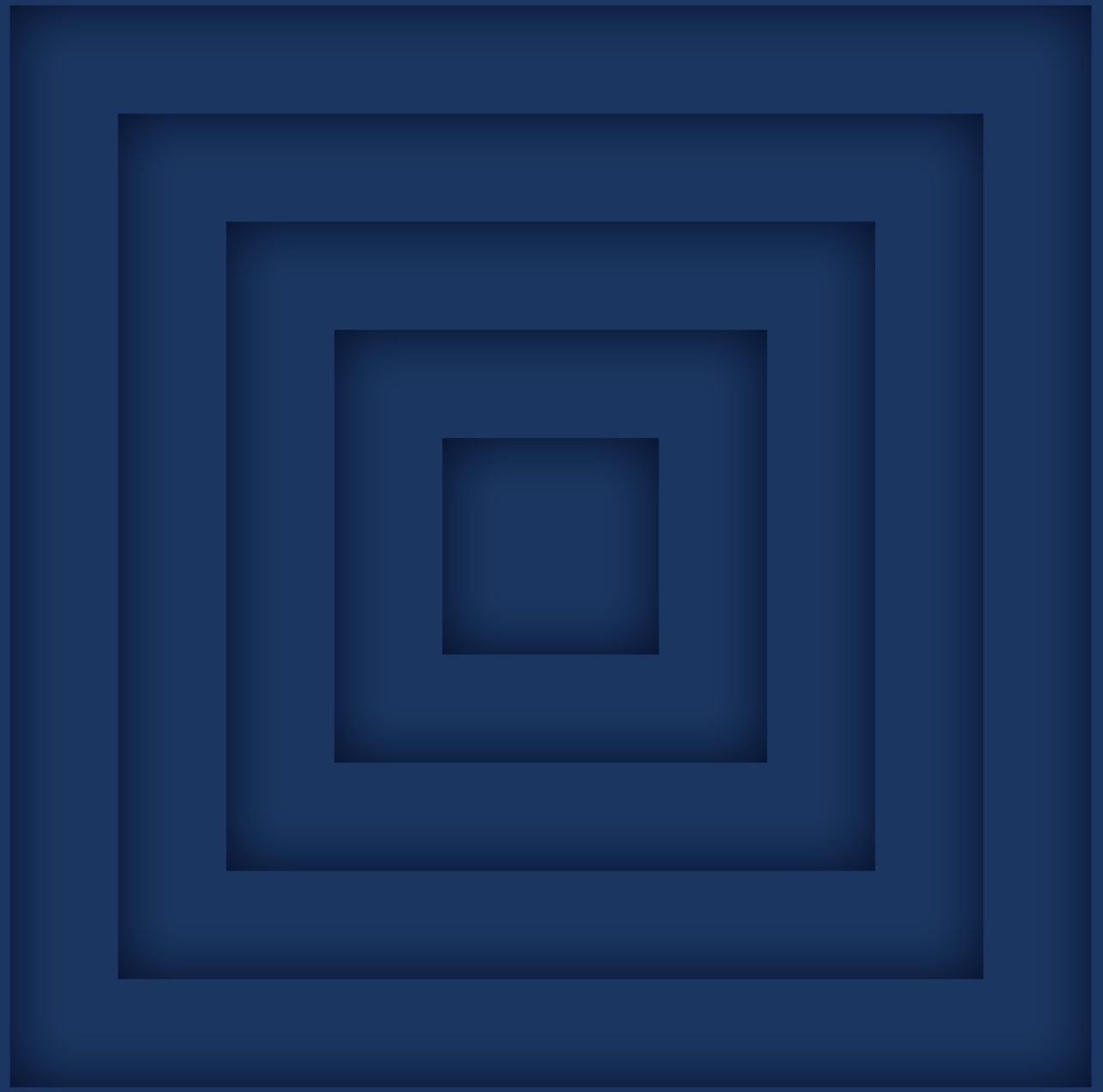
- Pathways are applicable to a wide range of case studies and scenarios…
- … but the specific chain of events underpinning them can differ significantly between localities.

Next steps

- The 7 pathways offer a handle to better understand the relationship between climate-related pressures and conflict in vulnerable regions
- Starting point for case-specific research and appraisal missions for policy purposes (planning, engagement, decision making)
- Input for interventions: inform and validate causal analysis, models, and interventions

Step 2 - ANTICIPATE

Develop targeted foresight and early warning systems



Evidence-based models and tools

1. Predictive Models

- Identify hotspot locations
- Aim: to mitigate negative conflict outcomes
- Example: Global Early Warning Tool

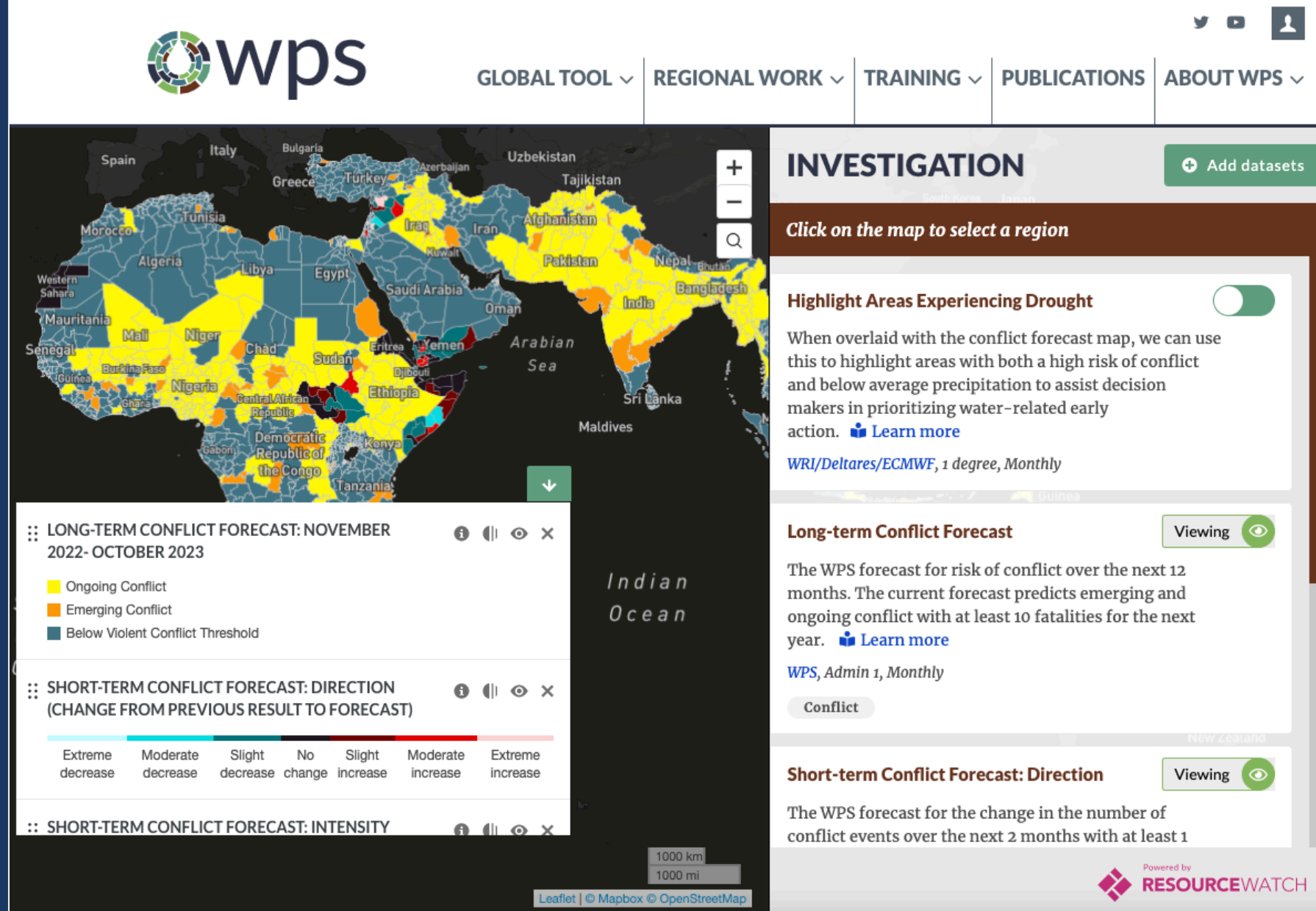
2. Causal Models

- Insight in underlying dynamics
- Aim: to address root causes instead of outcomes
- Example: Regional Causal Model

3. Causal Intervention Tool

- Decision support tool
- Aim: to optimise intervention options
- Example: Iraq

1. Global Early Warning Tool



2. Regional Causal Models

CAUSAL MODEL: MIDDLE EAST AND NORTH AFRICA

Overview

Indirect Causal Relationships

The causal graph shows the causal structure of environmental and other conditions that cause the armed conflict activity. Whereas the causal paths are rooted in vegetation coverage and rural population size, the magnitude of causal effect of the rural population size on the conflict events could not be estimated with sufficient certainty. Additionally, the density of green areas is an important root cause. However, the available data precluded estimation of its effect on the conflict events. The causal structure also shows that all the causal paths between the root causes and armed conflict activity are indirect.

Mediating Effects

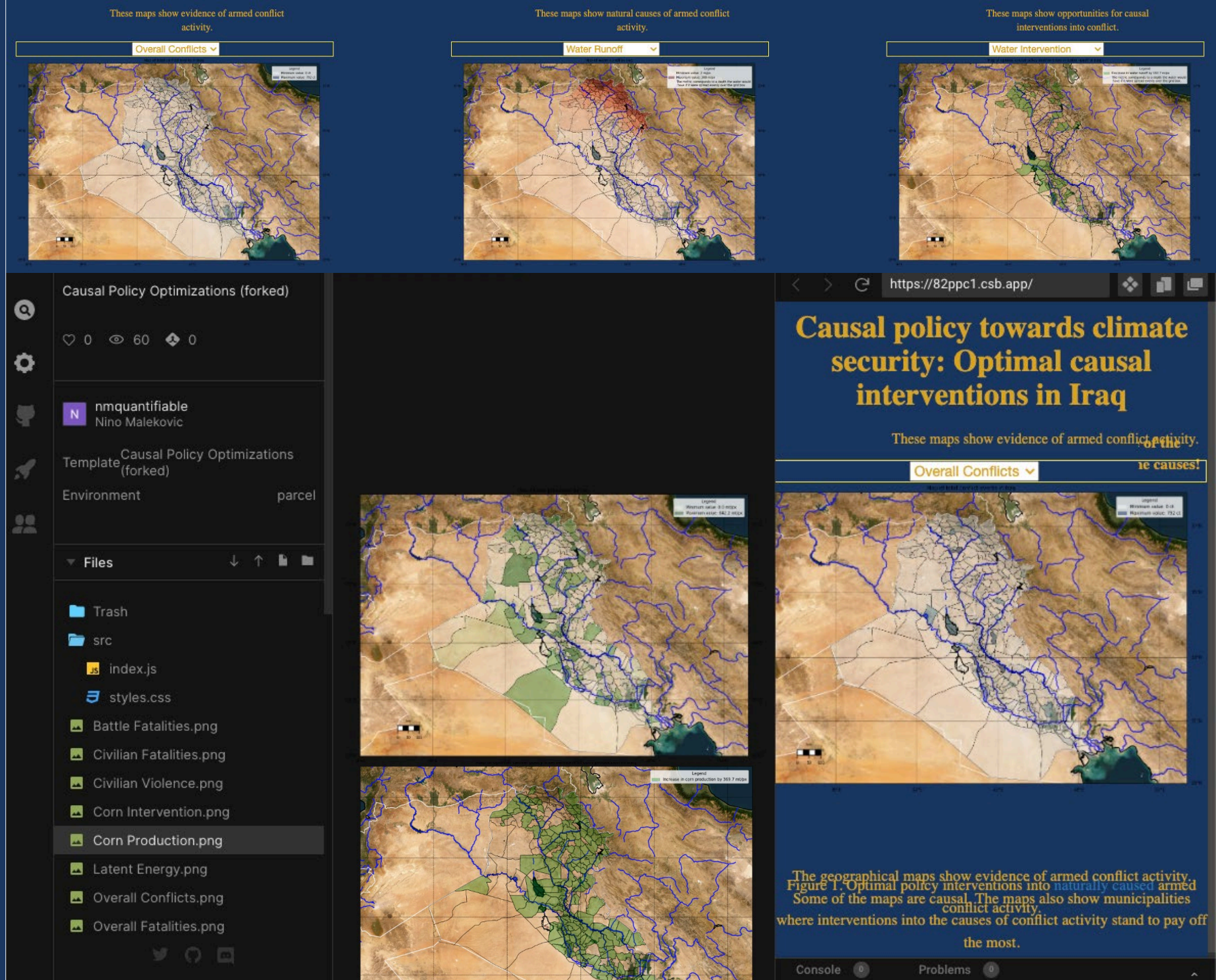
The indirect causal effects on the armed conflict activity are mediated by the remaining variables in the graph, including demographic (population density, rural population) and agricultural variables (portion of calories produced for food, count of livestock chicken, irrigated crop production, production of barley fields). Among these, especially important for the mediation of causal effects on the conflict events is the local population density. Notably, the local population density causes a decrease in the conflict events. The causal effect of the local population density was established at the 1% level of statistical significance.

Conflict Outcome

The causal graph examines the causality of armed conflict activity. Armed conflict is described by the total count of armed conflict events and the reported number of fatalities from conflict events.

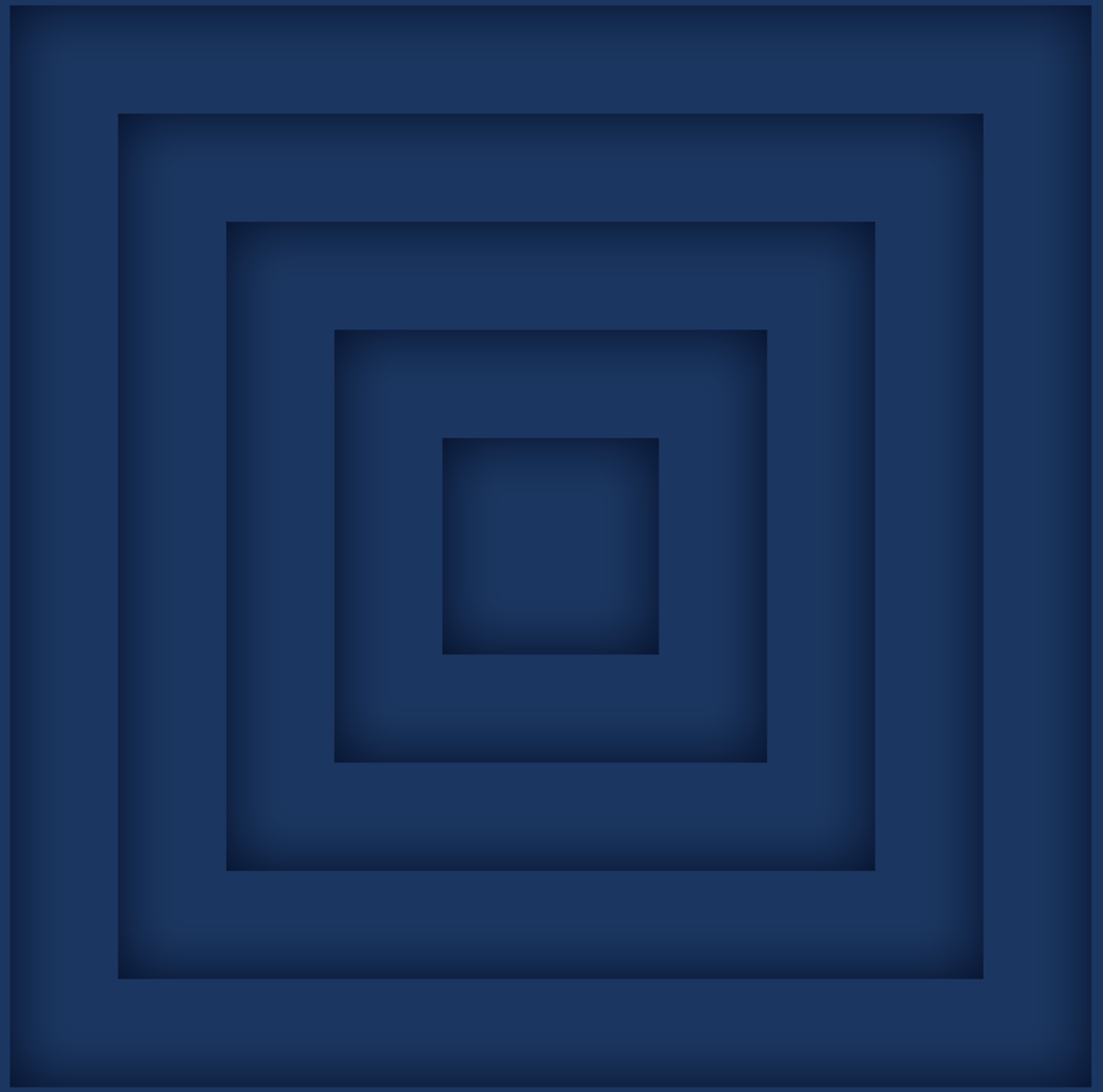
Causal Model: Middle East and North Africa
**significance of 1%

3. Causal Intervention Tool



Step 3 - MOBILISE

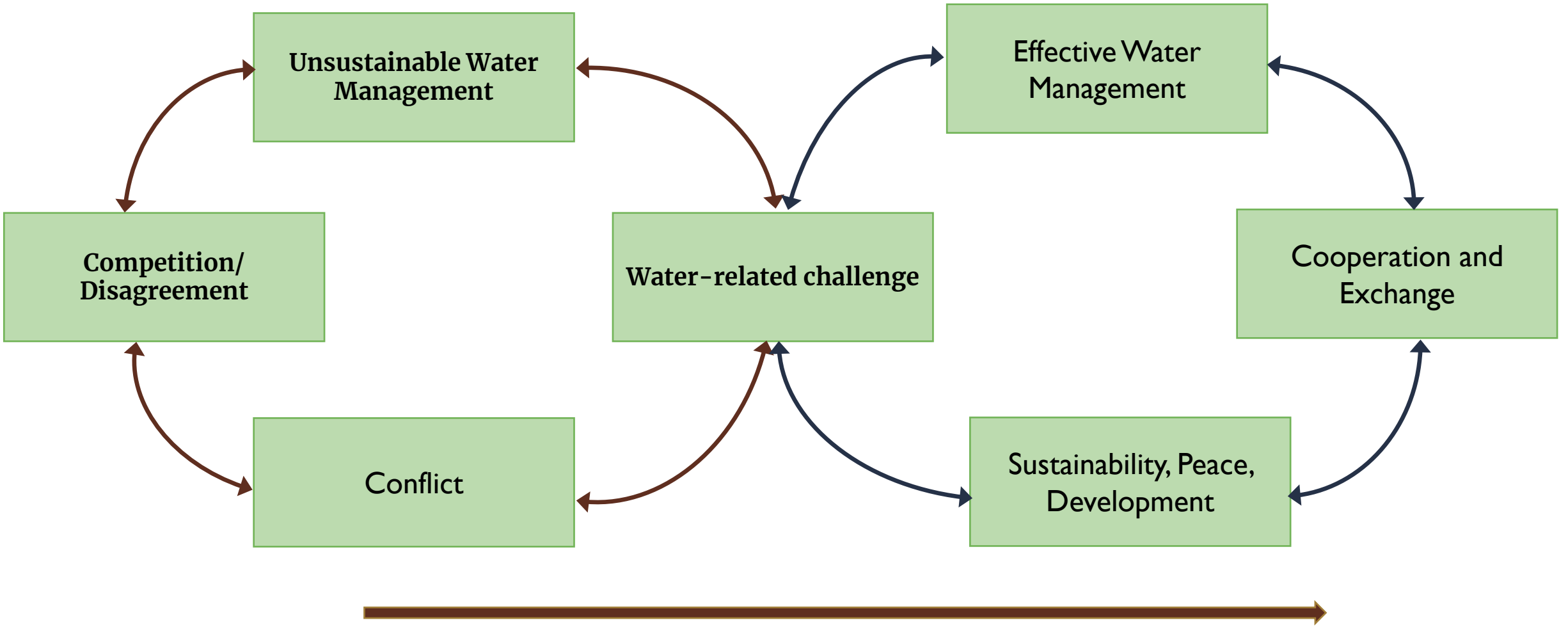
Design and initiate a multi-level stakeholder engagement strategy



Established approach:

Water as instrument for peace

WPS Aim: To turn vicious cycles of water and conflict into virtuous cycles of water-based peace and cooperation



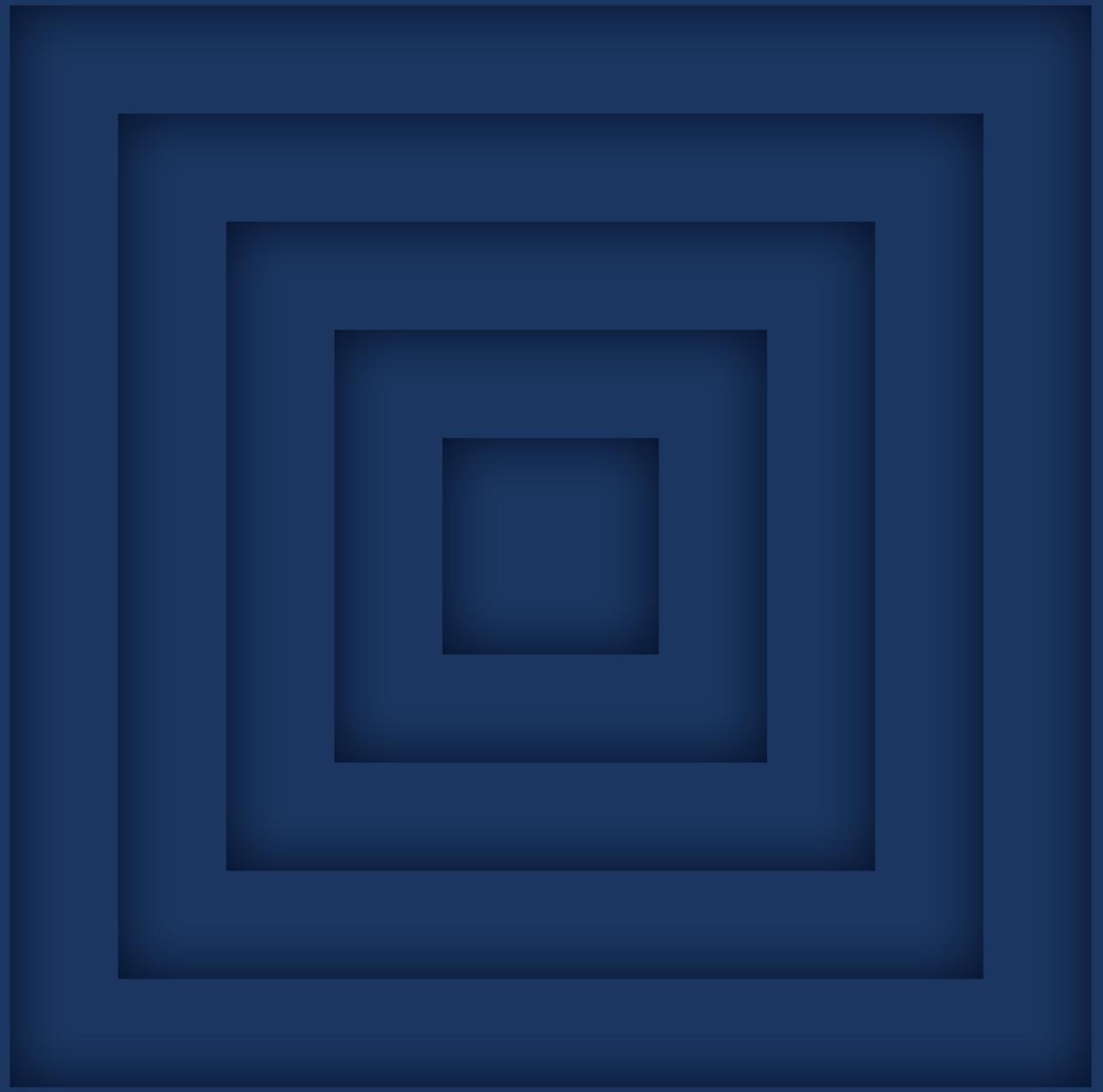
An Informed, Inclusive and Integrated Approach

Water Expertise + Peace Building Expertise

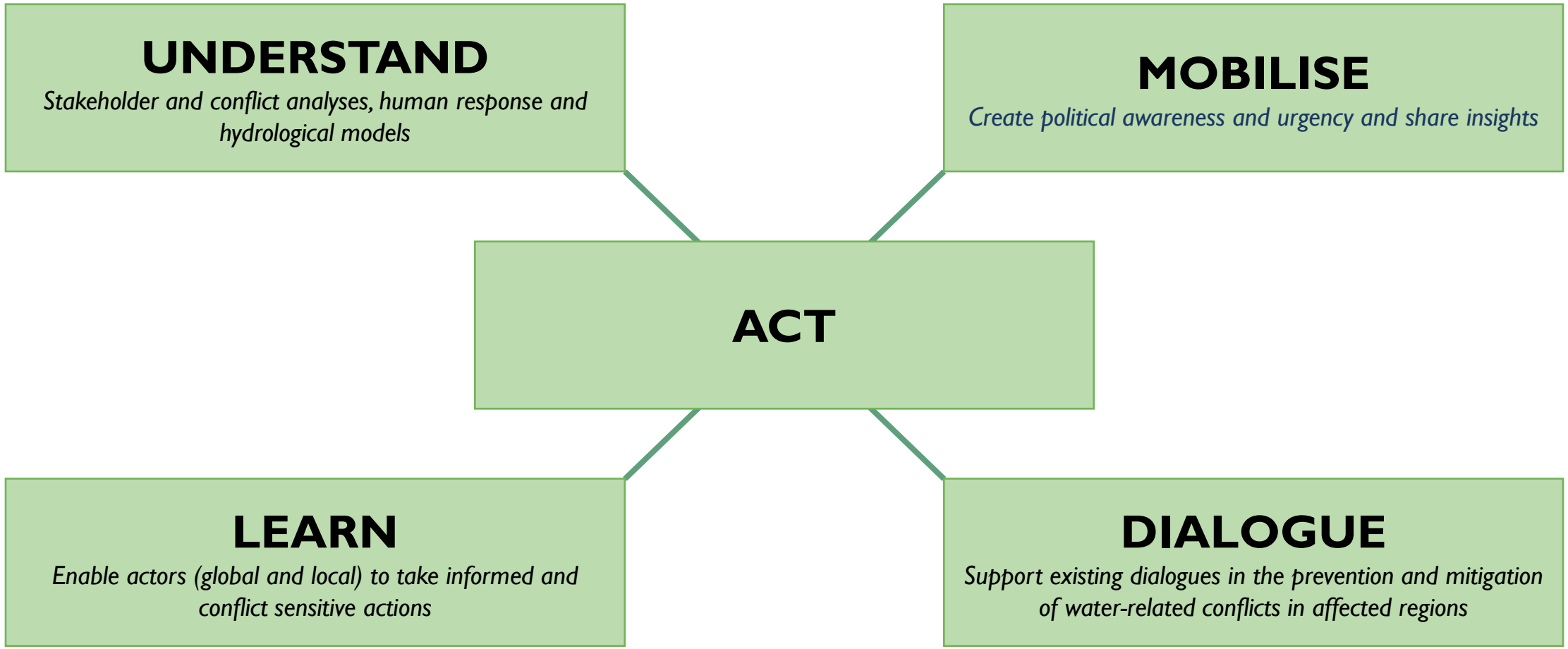
Science & Data + Policy & Practice

Step 4 - MITIGATE

Support capacity development, dialogue facilitation and decision making

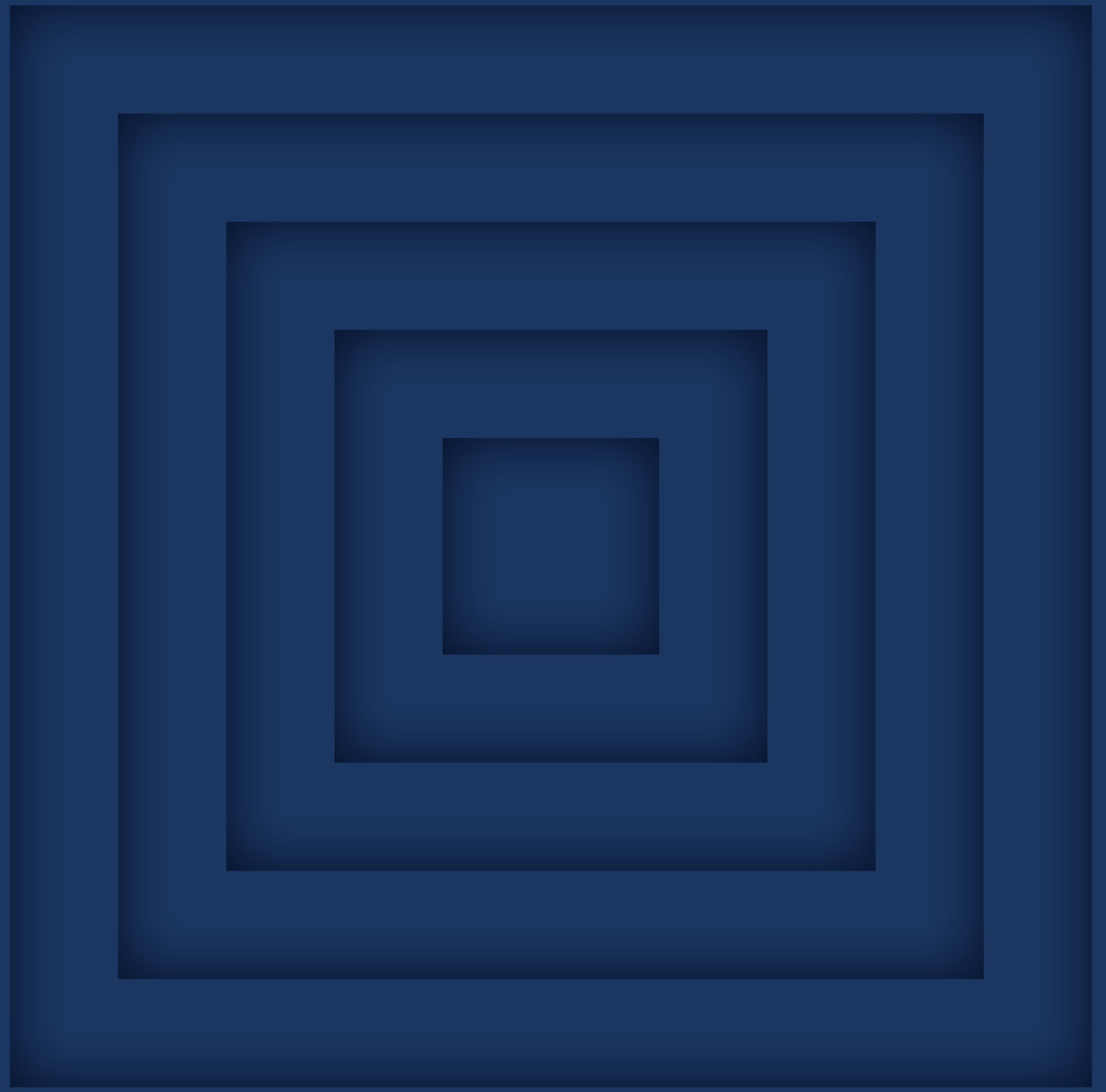


WPS Integrated Action Areas



WHAT

Takeaways for action



Monitor, measure, and mainstream…

1. **Social, economic and political stability is essential** for adaptation success. Solutions require constant monitoring and need to take into account ongoing and emerging security risks and dynamics.
2. We need **targeted foresight and early warning systems** that can predict and explain climate-related security dynamics in fragile regions as well as integrate local knowledge.
3. The (unintended) consequences of adaptation can worsen tensions with, between, and within local communities. Vulnerable groups get hit the hardest. Approaches should therefore be **gender- and conflict-sensitive**.
4. **Involving local community leaders** into the planning and implementation stages of adaptation projects is important for addressing community concerns and establishing more resilient local partnerships.
5. Regional and local **security actors have a role to play** to mitigate adaptation-related security risks. Their capabilities are essential to prepare for and respond to conflict escalation and related emergencies.

The Hague Centre
for Strategic Studies

SPEAKERS AND PANELLISTS

Speakers

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Moderator

Bianca Nijhof
Associate Director
Anthesis Group

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UN Decade on
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Tom Middendorp
Chair
International
Military Council on
Climate and Security

Dennis Kerkhoven
Co-founder
Tamatta

Lara Muller
Director Public Sector
Invest International

Robert de Bruin
Director Corporate
Affairs
Van Oord

Main message & Takeaways

WHY

We need to find new ways to meet the needs of future world populations in the backdrop of decreasing natural resources and a changing climate

HOW

Integrate landscape-scale Nature-based Solutions into our ecological, social and economic systems

NbS CRITERIA

ECOLOGICAL Applied on landscape-scale
SOCIAL Grounded on indigenous knowledge and within an inclusive, hybrid governance structure
ECONOMIC 1. Supported by new blended finance and governance instruments
2. Redirect the purpose of industry to use all our capital and allow scaling of the solutions

BENEFITS OF NbS

ECOLOGICAL Mitigating climate change ensures access to sufficient food and water for the population by reducing the risk of extreme weather events and preserving vital ecosystems
SOCIAL Help improve stability in fragile regions and prevent and mitigate resource-related security risks and impacts
ECONOMIC New public-private win-win situations towards circular economies on the short, medium and long term