



Component 1: Transboundary Aquifers and Groundwater Systems in Small Island Developing States

KEY MESSAGES

Lead: UNESCO International Hydrological Programme (IHP)

Core group: UNESCO IHP and UNESCO International Groundwater Resources Assessment Centre (IGRAC, Netherlands)

Expertise provided by: Goethe University (Frankfurt, Germany) and Simon Fraser University (Canada)



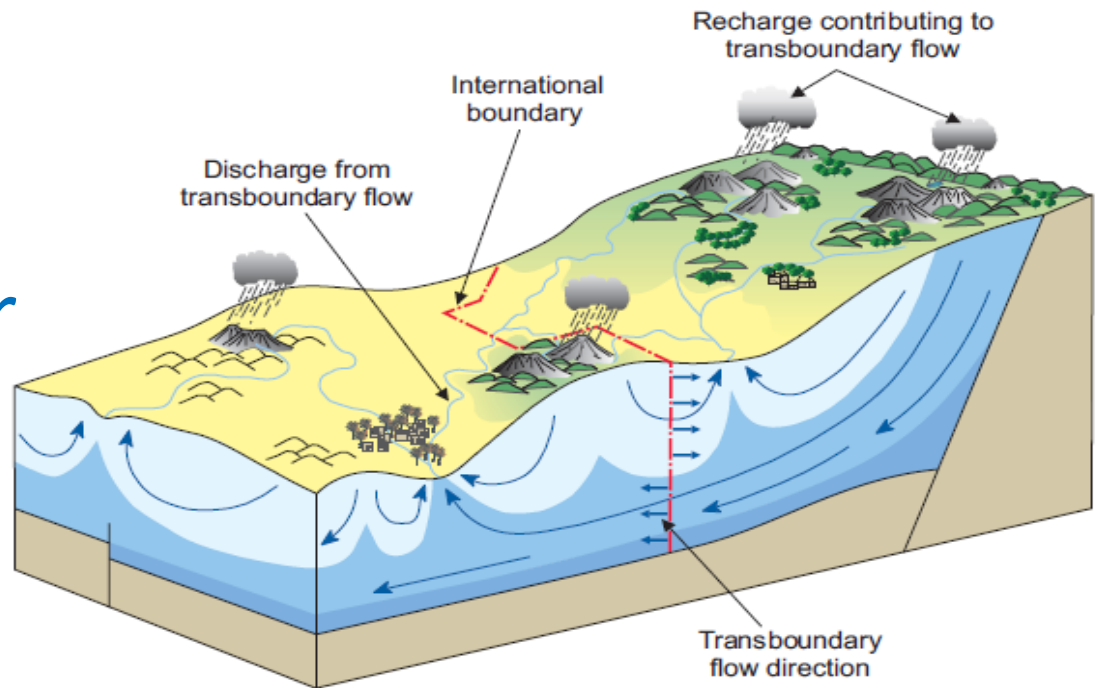
GROUNDWATER

accounts for

99%

*of the world's
liquid freshwater*

*2003 UN World Water
Development Report*



TWAP Groundwater

Assessment
Transboundary aquifers

Assessment SIDS
groundwater systems

Global
Inventory

WaterGAP
modelling

Literature
study

SIDS
Inventory

TWAP Groundwater Information Management System

10 core indicators for groundwater

Thematic cluster	Core Indicators
QUANTITY	Groundwater Recharge Groundwater Depletion
QUALITY	Groundwater natural background quality Groundwater pollution
SOCIO-ECONOMIC	Population density Renewable groundwater per capita Human dependence on groundwater Groundwater development stress
GROUNDWATER GOVERNANCE	Transboundary legal framework Transboundary institutional framework

Projections for 2030 and 2050 and determination of hotspots

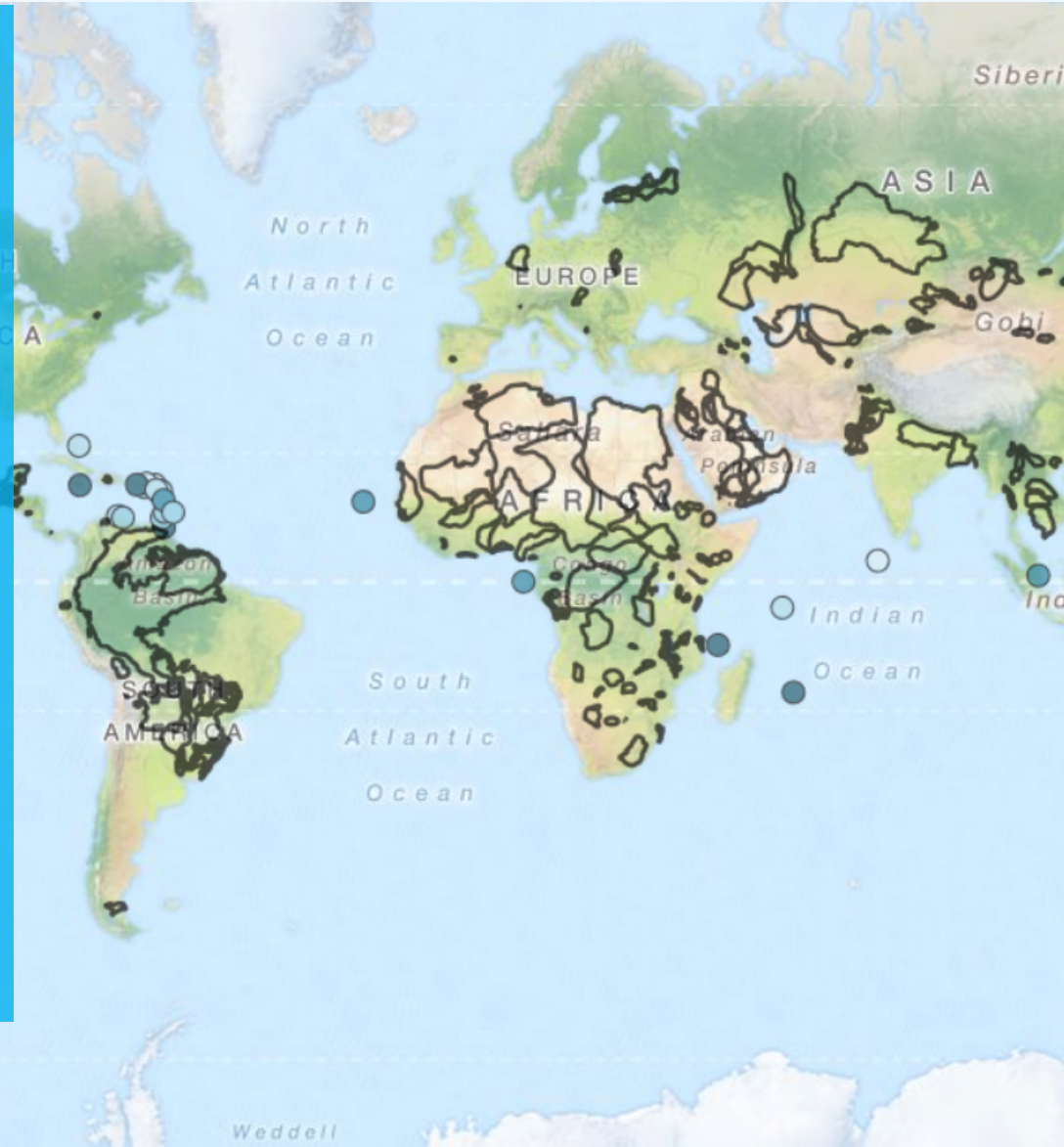
TWAP TBAs IN NUMBERS

199 Aquifers in the global inventory (TBAs > 5,000 km²)

91 Aquifers (TBAs > 20,000 km²) for WaterGAP study

126 Countries

> 200 Experts from 76 countries consulted



Key messages - TBAs

1. Transboundary aquifers represent a **largely untapped resource**
2. Areas of elevated groundwater development stress are presently limited, but will **more than double by 2050**
3. There is an alarming **lack of modern data and of governance frameworks**

Key messages - TBAs

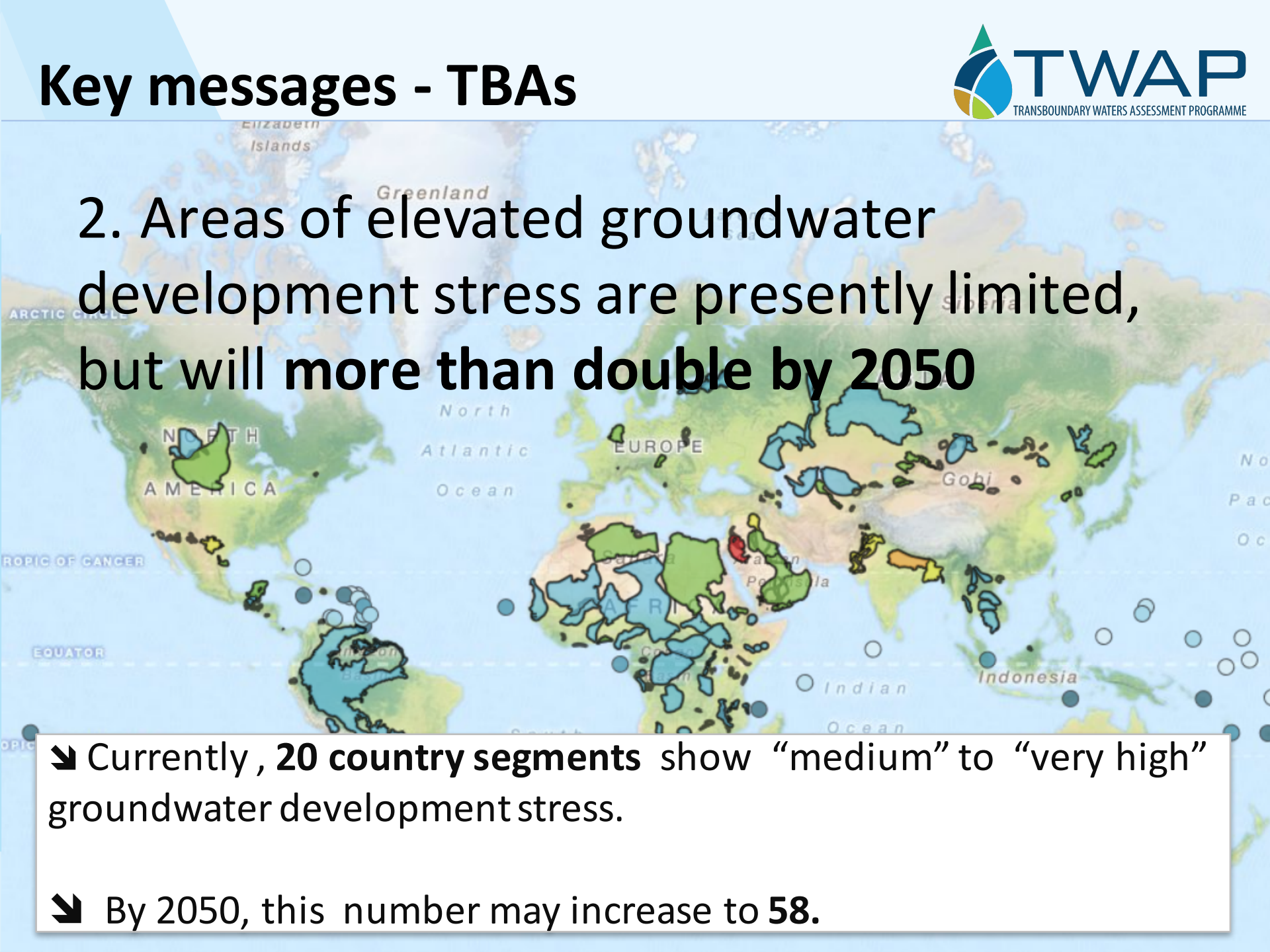
1. Transboundary aquifers represent a **largely untapped resource**

The majority of transboundary aquifers with surface expression greater than 5000 km²:

- Are located outside regions highly affected by groundwater development stress
- Show very low depletion rates of less than 2 mm/yr in most regions of the world
- Show generally low to very low human dependency on transboundary groundwater

Key messages - TBAs

2. Areas of elevated groundwater development stress are presently limited, but will **more than double by 2050**

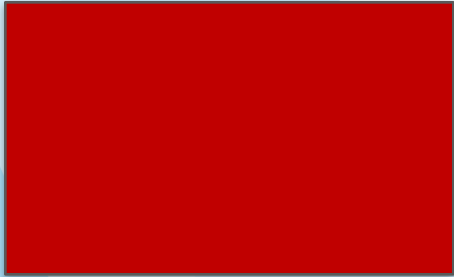


➤ Currently, **20 country segments** show “medium” to “very high” groundwater development stress.

➤ By 2050, this number may increase to **58**.

Groundwater stress hotspots

Translating indicators into risk categories



“VERY HIGH RISK”

- Groundwater development stress > 20%
- Dependence on groundwater > 40%



“HIGH RISK”

- Groundwater development stress > 20%
- Dependence on groundwater < 40%

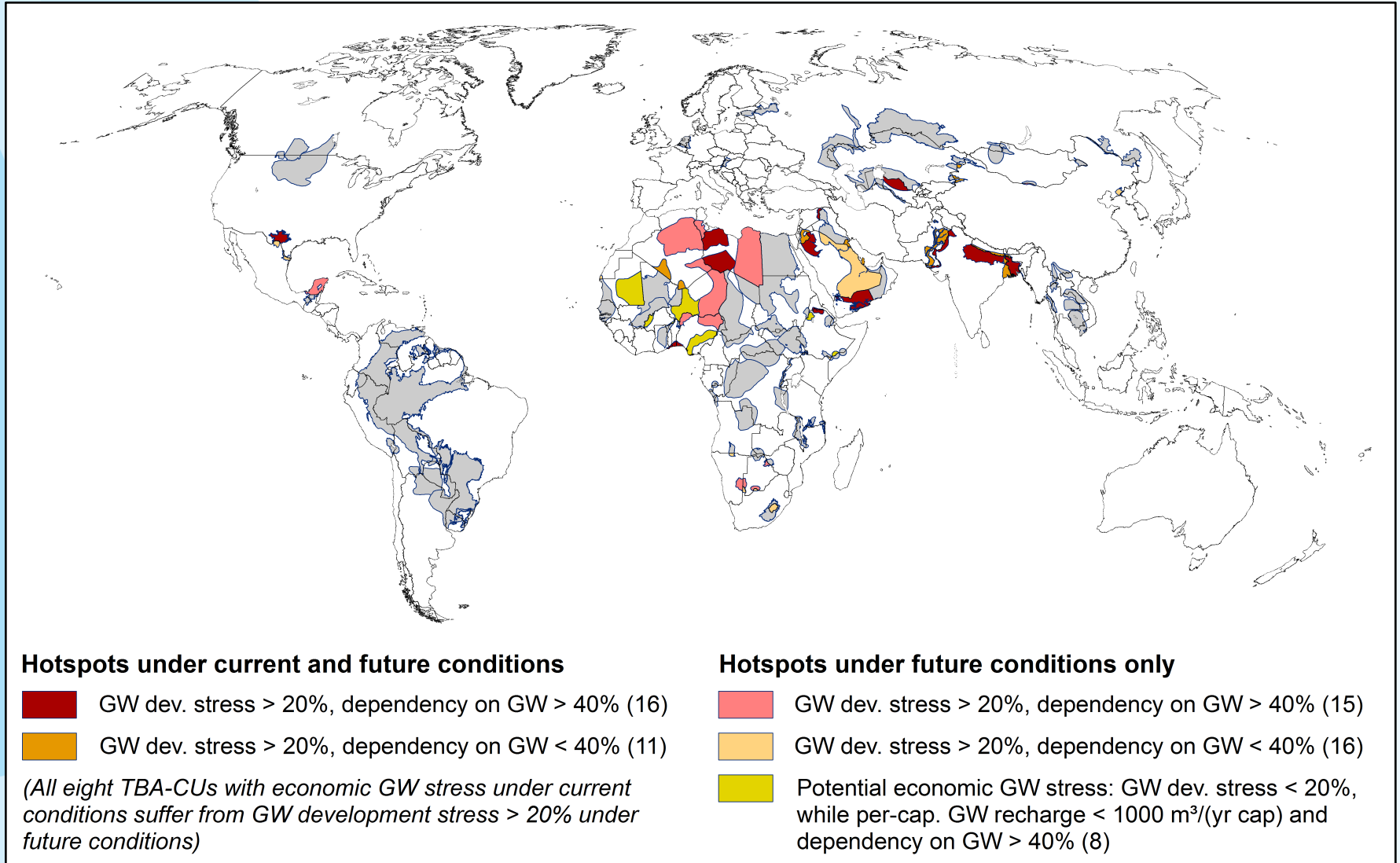


“GROUNDWATER CROWDING”

- Per capita resources < 1,000 m³/yr/cap
- Dependence on groundwater > 40%
- Groundwater development stress < 20%

Groundwater stress hotspots

Today and 2030, 2050



Groundwater stress hotspots

Conclusions

- Two-thirds of the identified hotspots are located on the African continent and the Arabian Peninsula. The others are distributed over Asia (Pakistan, India, Nepal, China, DPR Korea), and America (USA, Mexico, Chile).

Key messages - TBAs

3. There is an alarming **lack of modern data and of governance frameworks**

- Questionnaires: valuable but not sufficient to provide a globally complete picture
- Modelling: Essential to the baseline assessment, but with limitations

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- Questionnaires: valuable but not sufficient to provide a globally complete picture
- Modelling: Essential to the baseline assessment, but with limitations

Conclusion: Lack of quantitative, modern standardized data on key groundwater parameters, lack of knowledge of subsurface

3. There is an alarming **lack of** modern data and of **governance frameworks**

- The vast majority of TBAs have no transboundary governance framework
- Only eight TBAs have transboundary legal agreements
- The lack of adequate groundwater governance at the global, regional and local levels hinders the achievement of water security.

- *GEF Groundwater Governance Project*

TWAP SIDS

- 43 SIDS assessed
- For each, a representative hydrogeological profile was developed
- Assessment of risk factors for mountainous vs. low-lying SIDS
- Additional indicator added to address seawater intrusion

Non-Permeable Basement

Alluvial
Valleys

Key messages - SIDS

Many Island States are facing dramatic choices about ensuring:

1. A safe water supply
2. Groundwater sustainability (Water scarcity, pollution and high human dependency)

1. Dramatic choices for SIDS – a call to action

- In many islands, degradation of groundwater quality and growing demands are posing short-medium term threats to human health and impairing ecosystem services of great economic value.

2. Sustainability of groundwater is threatened

- Population density is the main driver of water stress in all but one of the SIDS assessed
- **71%** of all SIDS are at risk of water scarcity /**91%** of low-lying islands are at risk of water scarcity
- **73%** of SIDS are at risk of groundwater pollution, often worsened by seawater intrusion
- **10%** of Caribbean and Atlantic/Indian Ocean SIDS experience high human groundwater dependence
- **72%** of Pacific SIDS experience high human groundwater dependence



TWAP

TRANSBOUNDARY WATERS ASSESSMENT PROGRAMME

Thank you



UNEP-DHI PARTNERSHIP
Centre on Water and Environment



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Educational, Scientific and
Cultural Organization



International
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Programme



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Cultural Organization



Intergovernmental
Oceanographic
Commission

