

# **Instrumentos para a gestão e governança da água subterrânea**

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Food and Agriculture  
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## Shared Vision and Framework for Action on Groundwater Governance

WWF7 - Side event

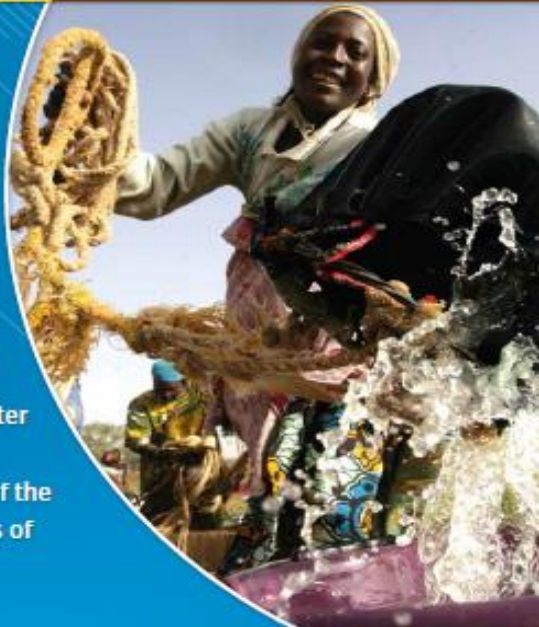
13.04.2015 | 17:00-19:00

Daegu EXCO, Room D\_312

Session code: SE0046

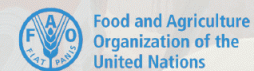
The session is geared toward understanding what would deliver sound governance of groundwater resources which account for 99% of the Planet Earth's accessible freshwater, provide all the daily water needs for one third of humanity and are crucial for environmental and social 'goods' upon which cities and rural communities have come to depend. According to experts, most - if not all - of the world's exploited aquifers are not being managed to conserve and protect these vital freshwater resources.

The session presents and discusses a "Shared Global Vision" and a "Framework for Action" on Groundwater Governance elaborated within the framework of a multi-partner, GEF supported initiative to address groundwater governance issues at global, regional and national levels. It also gives a synthetic overview of the consultative process and the main achievements of the initiative since its launch in 2011 and conveys key messages from the results of its analyses.



## Groundwater Governance

Side Event – 7<sup>th</sup> World Water Forum, Daegu, Korea



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www.theGEF.org

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### Importância da água subterrânea:

- > 98% de toda a água doce no estado líquido na Terra
- Abastece metade de toda a água de consumo, e >40% de todas as áreas regadas do Globo
- É um tampão crucial em áreas com stress de água



### Ameaças à água subterrânea:

- Decréscimo no armazenamento
- **Deterioração da qualidade** devido ao aumento da exploração e às atividades humanas
- Falta de informação
- Governança inapropriada dos sistemas

**O estado da água subterrânea está claramente ligado à sua governança.**

## Groundwater abstraction trends in selected countries

A extração total de água subterrânea no Mundo, estimada em 2010, é de aproximadamente 1000 km<sup>3</sup> por ano

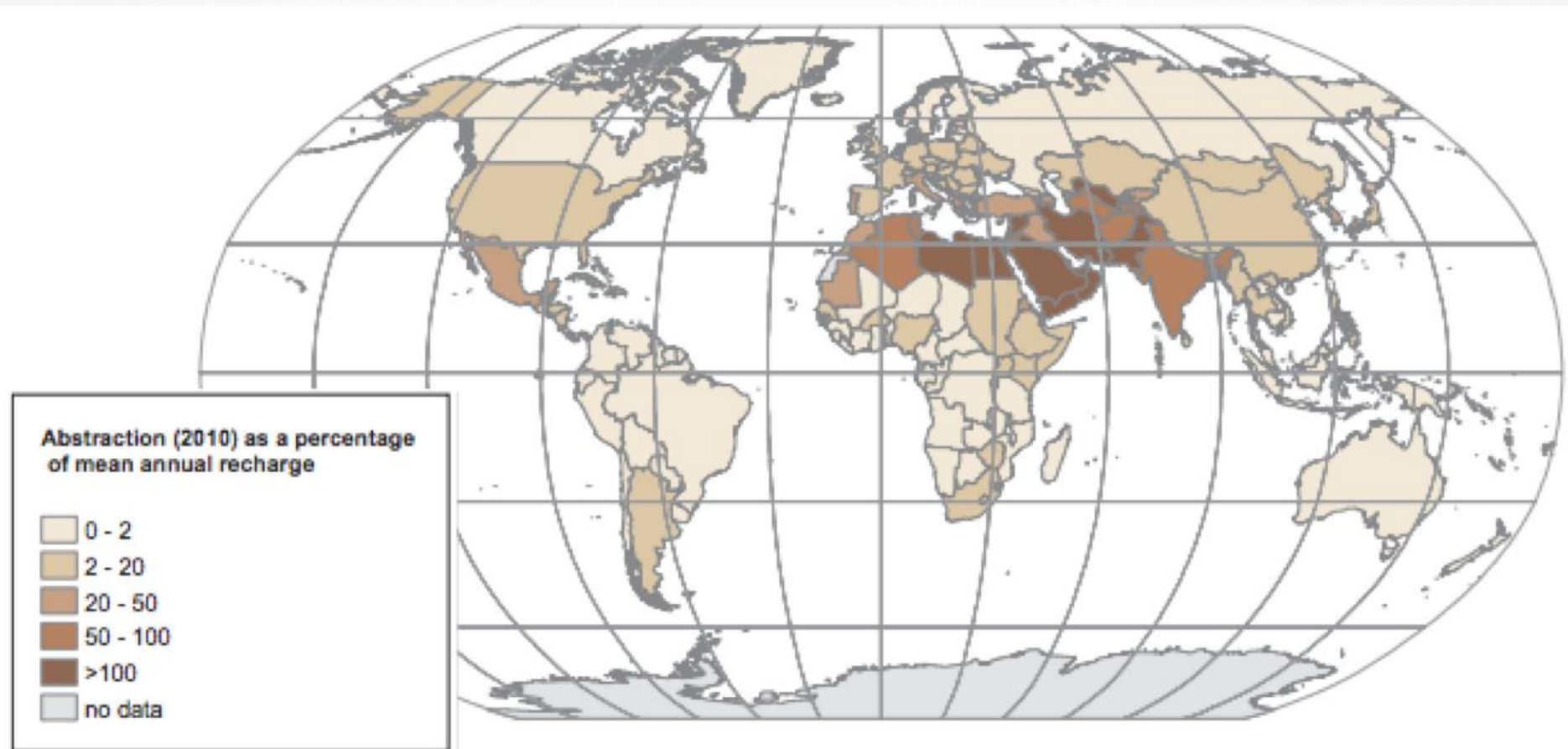
- 67% para rega
- 22% para uso doméstico
- 11% para usos industriais

IGRAC. 2010



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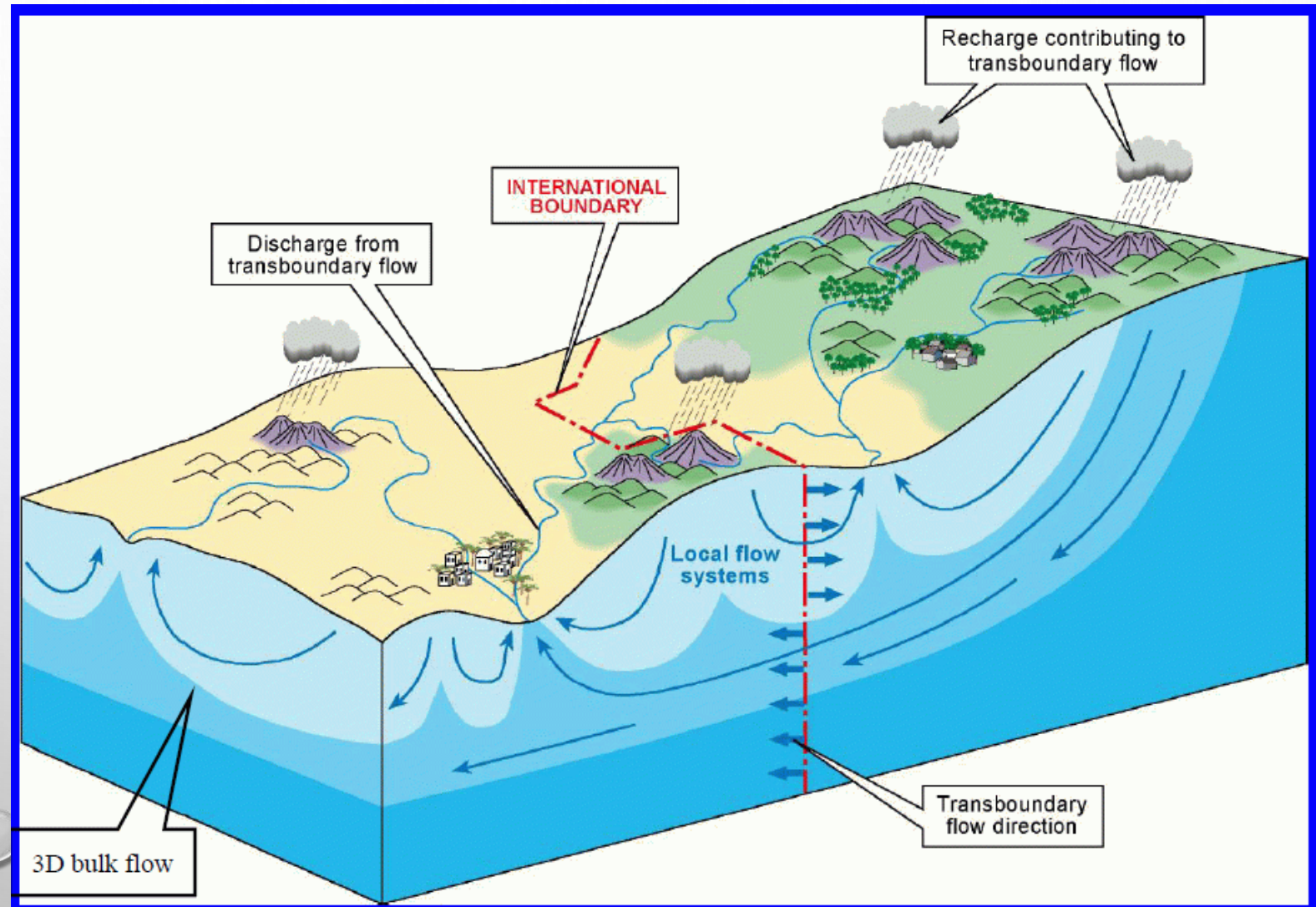
## Indicador de stress da exploração de água subterrânea a nível dos países



Source: IGRAC (2010).

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## Aquíferos transfronteiriços



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- **UMA VISÃO GLOBAL PARTILHADA PARA A GOVERNANÇA DA ÁGUA SUBTERRÂNEA 2030**
- Uma Visão para o Mundo em 2030, no qual cada país tomou as ações apropriadas e efetivas para gerir a sua água subterrânea, de modo a atingir as metas globais do desenvolvimento social e económico e evitar a degradação irreversível dos recursos de água subterrânea e dos sistemas aquíferos.

GEF-FAO-UNESCO-IAH  
World Bank  
2013



**Groundwater Governance**  
A Global Framework for Action

## Groundwater abstraction trends in selected countries

### Os objetivos a atingir em 2030

- Que haja uma rede regulatória e institucional legal apropriada e implementada para a água subterrânea que estabeleça a tutela pública e a responsabilidade coletiva, o envolvimento permanente das partes interessadas e a integração benéfica com outros setores, incluindo outros usos do espaço sub-superficial e dos seus recursos
- Todos os aquíferos principais são adequadamente geridos, com a informação resultante e o conhecimento partilhado, com o uso de técnicas de comunicação atualizadas
- Planos de gestão preparados e implementados para os aquíferos prioritários
- Agências locais, regionais, nacionais e internacionais de gestão de águas subterrâneas são adequadamente financiadas e as suas principais tarefas de capacitação, recursos e monitorização da qualidade e promoção da gestão da procura, juntamente com medidas do lado da oferta, estão garantidos
- Programas de investimento e de incentivo para a sustentabilidade, uso eficiente da água e para a proteção adequada dos sistemas aquíferos



# Temas e conclusões do 7º Fórum Mundial da Água - *Testemunhos da participação Portuguesa* -

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## **Instrumentos criados para uma melhor gestão e governança das águas subterrâneas:**

([http://www.whymap.org/whymap/EN/Home/whymap\\_node.html](http://www.whymap.org/whymap/EN/Home/whymap_node.html))

([http://www.whymap.org/whymap/EN/Downloads/downloads\\_node\\_en.html](http://www.whymap.org/whymap/EN/Downloads/downloads_node_en.html))

Mapa dos Recursos Hídricos Subterrâneos do Globo (Groundwater Resources of the World, 2004, 2008)

Mapa Global dos Aquíferos Transfronteiriços (Groundwater Resources of the World - Transboundary Aquifer Systems, 2006 )

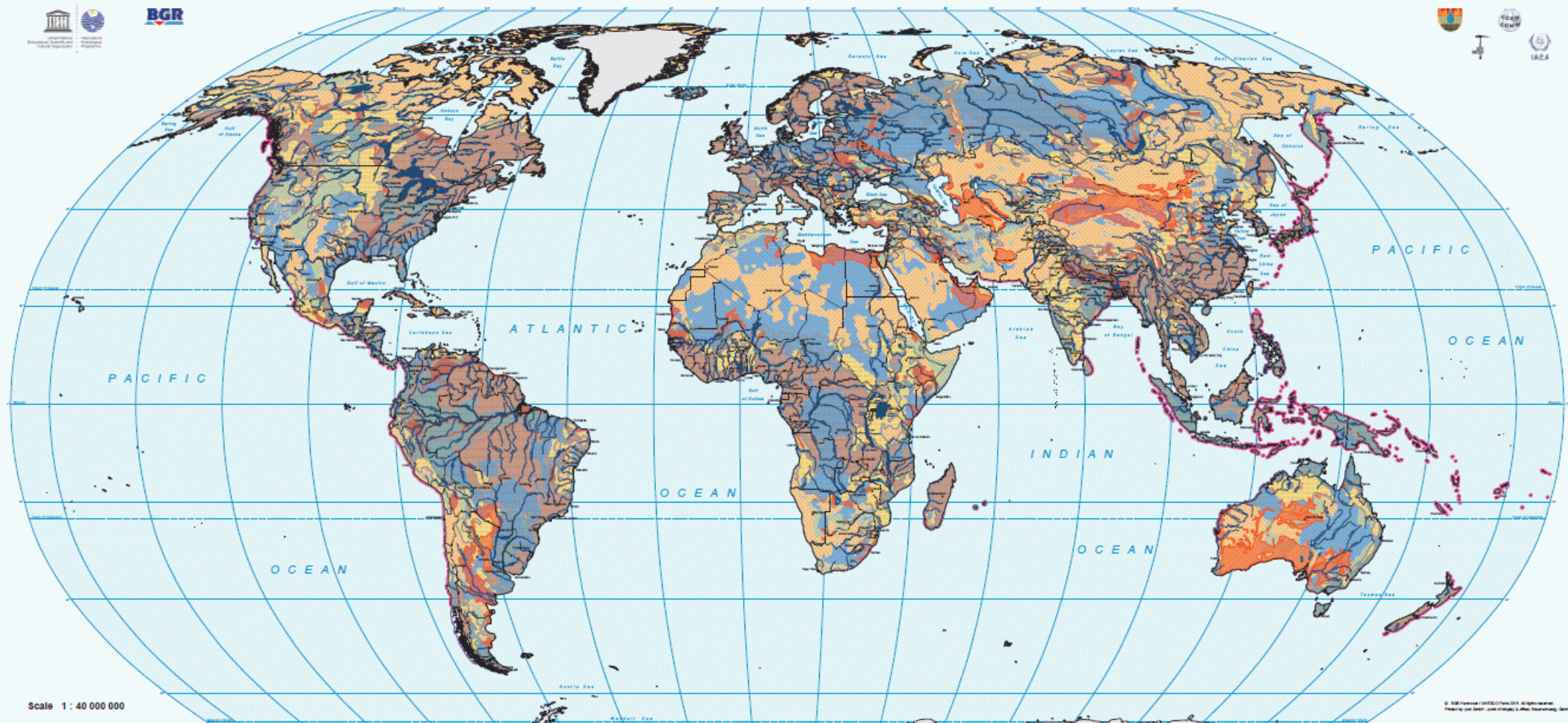
Mapa Global das Bacias Hidrográficas e Hidrogeológicas (River and Groundwater Basins of the World, 2012)

Mapa Global dos Aquíferos Salinos (envolto nalguma polémica e ainda não publicado)

Mapa Global da Vulnerabilidade dos Aquíferos a Cheias e Secas (Groundwater Vulnerability to Floods and Droughts, 2015)

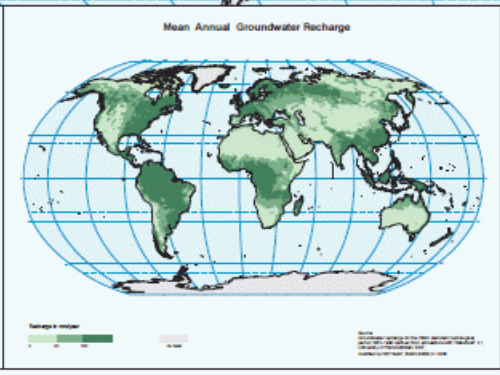
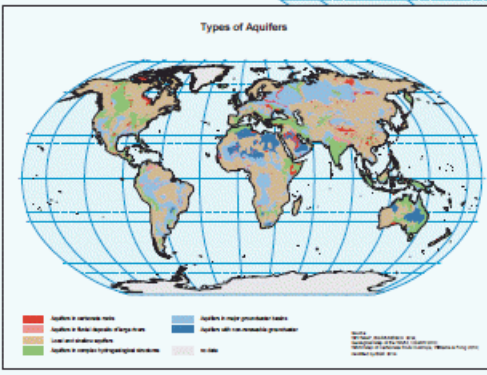
([http://www.whymap.org/whymap/EN/Downloads/Global\\_maps/globalmaps\\_node\\_en.html](http://www.whymap.org/whymap/EN/Downloads/Global_maps/globalmaps_node_en.html))

# Global Groundwater Vulnerability to Floods and Droughts



Scale 1 : 40 000 000

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The concept of global groundwater vulnerability classification

Being aware of the global population growth, rapid urbanization, intensification of agricultural production, as well as increasing industrialization will require growing water quality and supply of water. To meet these increasing demands, only natural, natural resource management and protection have to be considered, which are the most sustainable and cost-effective options. Groundwater resources are considered as important, reliable and sustainable available water resources. However, these resources are relatively less vulnerable and more resistant to external influences, such as floods and droughts, than surface waters. These external hydrological events can have devastating impacts on human life, generate economic loss and increase mortality and morbidity. Besides that, floods and droughts frequently increase the likelihood of disease, change aquifers, alter the aquifer properties for several years, and affect the quality of groundwater resources and conditions to maintain emergency water supplies.

The Global Groundwater Vulnerability to Floods and Droughts indicates the level of vulnerability of groundwater resources of the world. It presents the global vulnerability of groundwater systems and the ability of resistance of these systems to natural disasters.

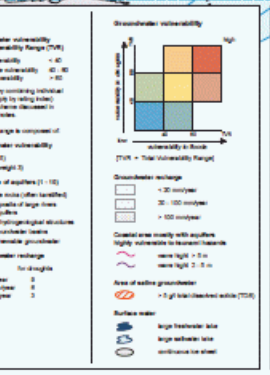
The concept of groundwater vulnerability class is based on the geological characteristics of the aquifer and the physical environment (climate, different degrees of protection against natural or human activities, natural recharge, aquifer in low frequency or in low concentration deposits of large mass and high permeability, thick and drought, and coastal aquifers are particularly prone to increase, with the groundwater resources in these coastal aquifers are relatively less vulnerable and more resistant to natural disasters due to their protection from both sides by geological layers with low permeability, lower or no recharge, and naturally occurring, solid earth, which makes it the groundwater emergency water supply system).

The assessment of groundwater vulnerability is usually based on a classification of various natural parameters, such as soil type, geology and thickness of the confining rock, aquifer type, recharge rate and slope. However, there is a lack of data in many regions of the world. Thus, the evaluation presented in this work is mainly based on parameters that were globally available for the type of aquifer and annual groundwater recharge. The groundwater vulnerability classification proposed for this map is suitable for use as a global reference. Due to the work's content, it can be used for specific and local projects. These vulnerability parameters, based on natural factors, can only have a limited impact on groundwater vulnerability maps of a large scale.

In order to make a comprehensive assessment of groundwater vulnerability, additional weighting and a rating scale have been assigned to the 'type of aquifer' and 'groundwater recharge' according to their considered importance for the vulnerability assessment. A correlation scale for both parameters has been established. The 'Global Groundwater Vulnerability' (GV) is divided into three categories: low, moderate and high groundwater vulnerability. Generally, the lower the correlation score the lower the vulnerability, and the higher the level of natural protection of groundwater against hydrological extremes, the higher the GV. In floods and the GV for droughts have been combined. The resulting vulnerability of vulnerability is divided into the map's different zones.

The map is the result of a joint project 'Groundwater for Emergency Situation' (GWES) and the 'Hydrological Hydrogeological Mapping and Assessment Programme' (HMAP/HAAP). GWES is a UNESCO International Hydrogeological Programme (IHP) project aiming at providing low-cost products and procedures to identify and assess groundwater vulnerability and groundwater resources with low vulnerability that could be used in emergency situations due to extreme events (natural and non-natural) that already impact human health and the HMAP/HAAP aims at studying, monitoring and modeling hydrogeological phenomena at a global scale, to develop groundwater related data in an appropriate way for global databases on water resources and to give impetus to include underground water resources. HMAP/HAAP is a programme of a consortium including the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Commission for the Geological Map of the World (CGMW), the International Association of Hydrogeologists (IAH) and the International Water Agency (IWA) and the German Bundesanstalt für Geowissenschaften und Rohstoffe (BGR).

Detailed information and the full version of vulnerability classification are provided in the accompanying explanatory notes. See: [www.iaglr.org](http://www.iaglr.org)



Prepared by  
 Jonathan Vitor and Andrea Roldán (IAGLR Editors),  
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 and the IAGLR/HAAP Steering Committee  
 under the auspices of UNESCO IHP and BGR

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Map projection:  
 Robinson projection, longitude of central meridian: 117°, spherical radius: 6371 km, geographic coordinates

Notes:  
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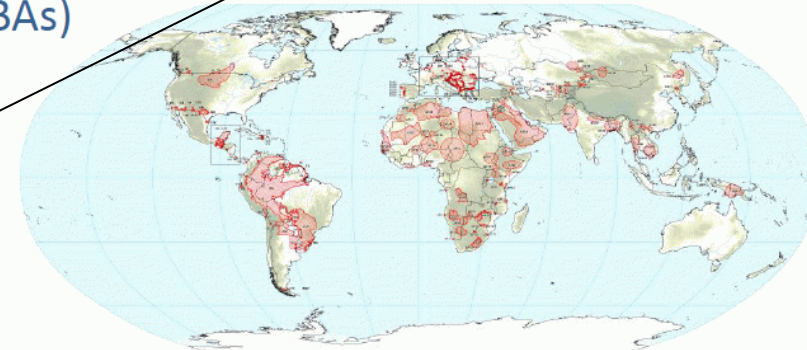
GLOBAL GROUNDWATER VULNERABILITY TO FLOODS AND DROUGHTS  
 1 : 40 000 000  
 Technical specification: A4, scale 1 : 20 000 000  
 IAGLR/HAAP  
 www.iaglr.org

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## UNESCO's leading role in transboundary GW governance

- ISARM  $\Rightarrow$  TWAP  $\Rightarrow$  GGRETA
- ISARM:
  - International Shared Aquifers Resources Management
  - Inventory of Transboundary Aquifers (TBAs)
- TWAP:
  - TB waters assessment program
  - Global assessment 166 TBAs & 43 SIDS
- GGRETA:
  - Groundwater Governance of Resources in Transboundary Aquifers
  - In-depth assessment of TBA case studies
  - Spatially differentiated information, maps

Transboundary Aquifers (TBAs)  
Small Island Developing States (SIDS)  
groundwater systems



**Ano 2030**

**Tornar realidade a  
Cooperação entre países para  
o estabelecimento da governança  
conjunta dos Aquíferos  
transfronteiriços**

**Muito obrigado**