World Water in 2025

Global Modeling and Scenario Analysis for the
World Commission on Water for the 21st Century

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Introduction

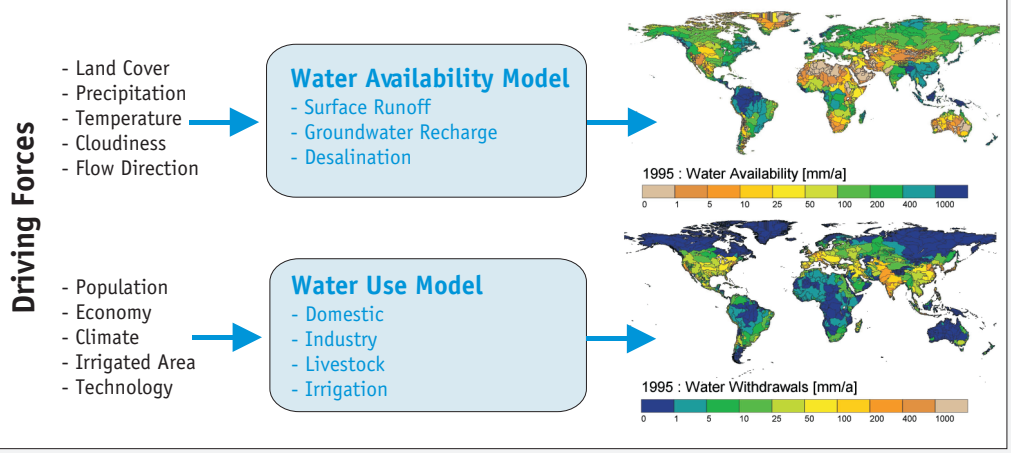
What are the trends in the world water situation? Will there be enough freshwater for homes, factories and irrigated farms around the world? Where will water resources be under heavy pressure, and how many people will live where water is short?

These are some of the questions addressed in a series of global water scenarios, which were examined as part of the World Water Commission's 'Vision Exercise'.

These scenarios were quantified and analysed at the Center for Environmental Systems Research at University of Kassel by utilising a global computer model: WaterGAP.

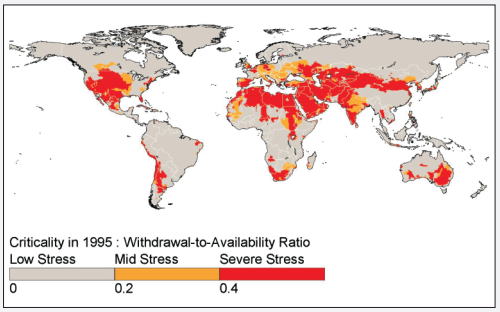
The WaterGAP model

The WaterGAP model (*Water*-Global *A*ssessment and *P*rognosis) consists of two main components - a water availability model and a water use model. Calculations are carried out on a global grid of 0.5 degrees, and aggregated to the watershed level. Thus, results for more than 4000 river basins are computed:



Stress on Water Resources

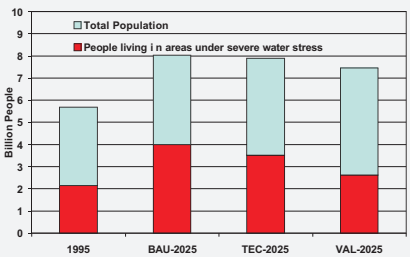
Water Criticality in Today's World [1995]



River basins are assumed to be under "severe water stress" when more than 40% of the total available water is withdrawn for different uses. However, the capacity to cope with high levels of stress on water resources differs greatly between regions.

People Living where Water is Short

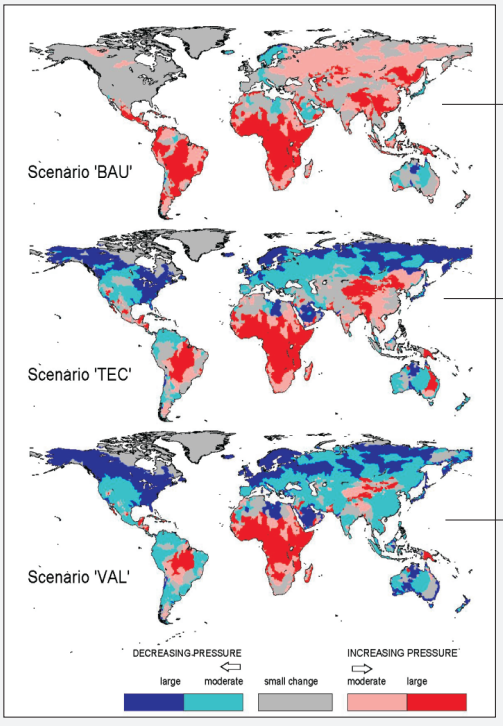
Population in Areas under "Severe Water Stress"



One quarter of the total land area is estimated to be under "severe water stress" today and 2.1 billion people live in these regions. By the year 2025, based on a Business-as-Usual scenario, as many as 4 billion people will live in river basins under "severe water stress".

Water Futures

Changes in Pressure on Water Resources up to 2025



Scenario Assumptions

Developments up to 2025

In tandem with the World Water Commission's Scenario Development Panel three scenarios have been analysed:

Business as Usual [BAU]
- This scenario assumes a continuation of current policies and trends. No special efforts are made to curtail water use. Up to 2025 global population increases to 8 billion, and average income grows by 59 percent. The extent of irrigated land stabilises.

Technology, Economics, and Private Sector [TEC]
- This scenario focuses on water savings through private sector initiatives. Investments bring strong technological improvements in the efficiency of water use. Population reaches 7.9 billion. Globalisation drives economic growth, income increases by 93 percent - but the poorest countries are left behind. Global irrigated area grows by 23 percent.

Values and Lifestyles [VAL]
- This scenario focuses on water savings through changes in values and behaviour. These bring far-reaching structural changes in the way water is used. Population rises to 7.5 billion. Global average income grows by 88 percent - with the highest growth rates in the poorest countries. Irrigated area grows by only 5 percent globally.

Summary & Conclusions

Under current trends, slow improvements in water use efficiency do not keep up with increasing water demands. By 2025, areas under "severe water stress" expand and intensify, while the number of people living in such areas doubles to 4 billion. This increases the risk that simultaneous water shortages around the world could trigger a kind of global water crisis.

But how we can break these trends? First, by accelerating improvements in water use efficiency. Second, by making basic structural changes in how we use water in households, in industry, and in agriculture.

Literature

Alcamo, J., Henrichs, T., R sch, T. (2000) : World Water in 2025. Report A0002, Center for Environmental Systems Research , University of Kassel, Kurt-Wolters-Str. 3, 34125 Kassel, Germany.
Http://www.usf.uni-kassel.de/usf/aktuell/worldwatec.htm