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New Solutions for Environmental, Urban and Health Systems**

The three „P“ challenge of sustainable water resources management

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The multidimensional challenges of sustainability

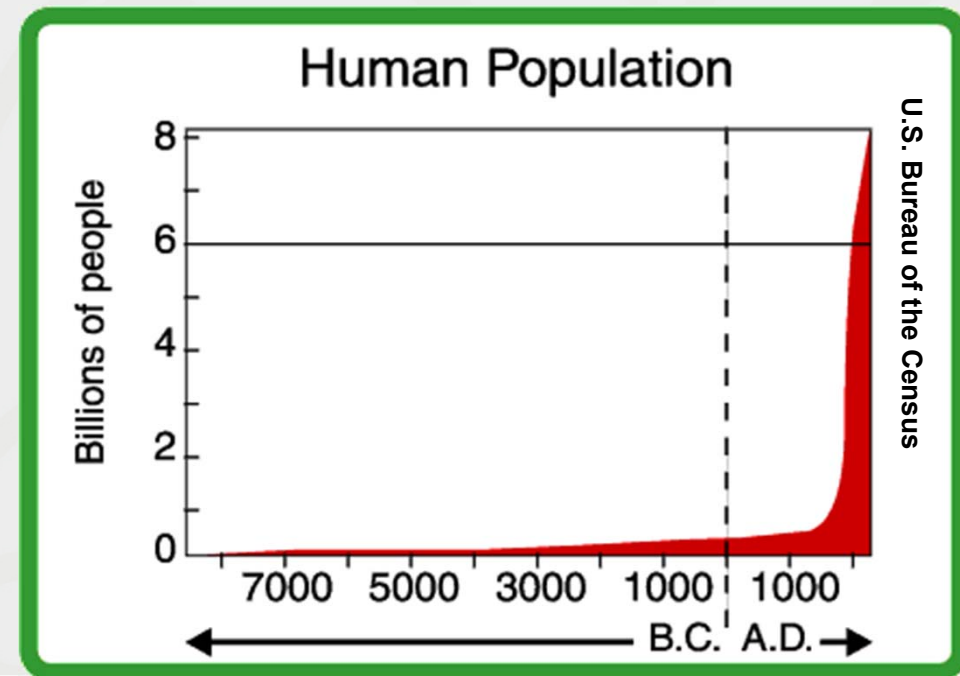
The three „P“ problems of the world are the main threats for a sustainable and balanced future

❖ **Population growth**

❖ **Poverty**

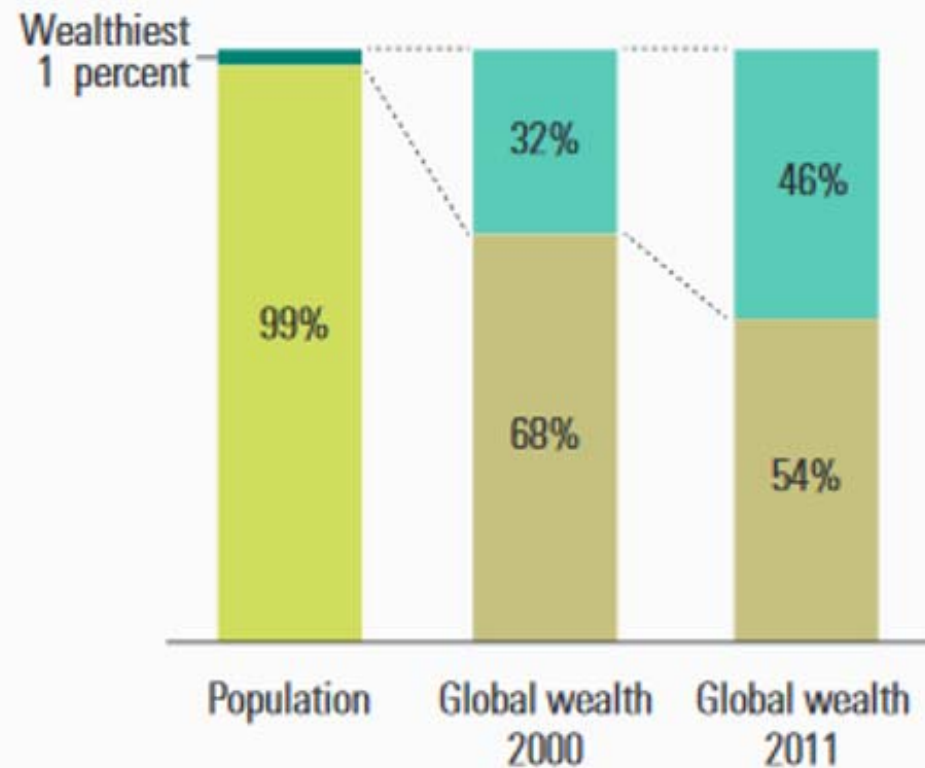
❖ **Pollution**

(incl. climate change as a sort of atmospheric pollution)



Rapid increasing global wealth inequality

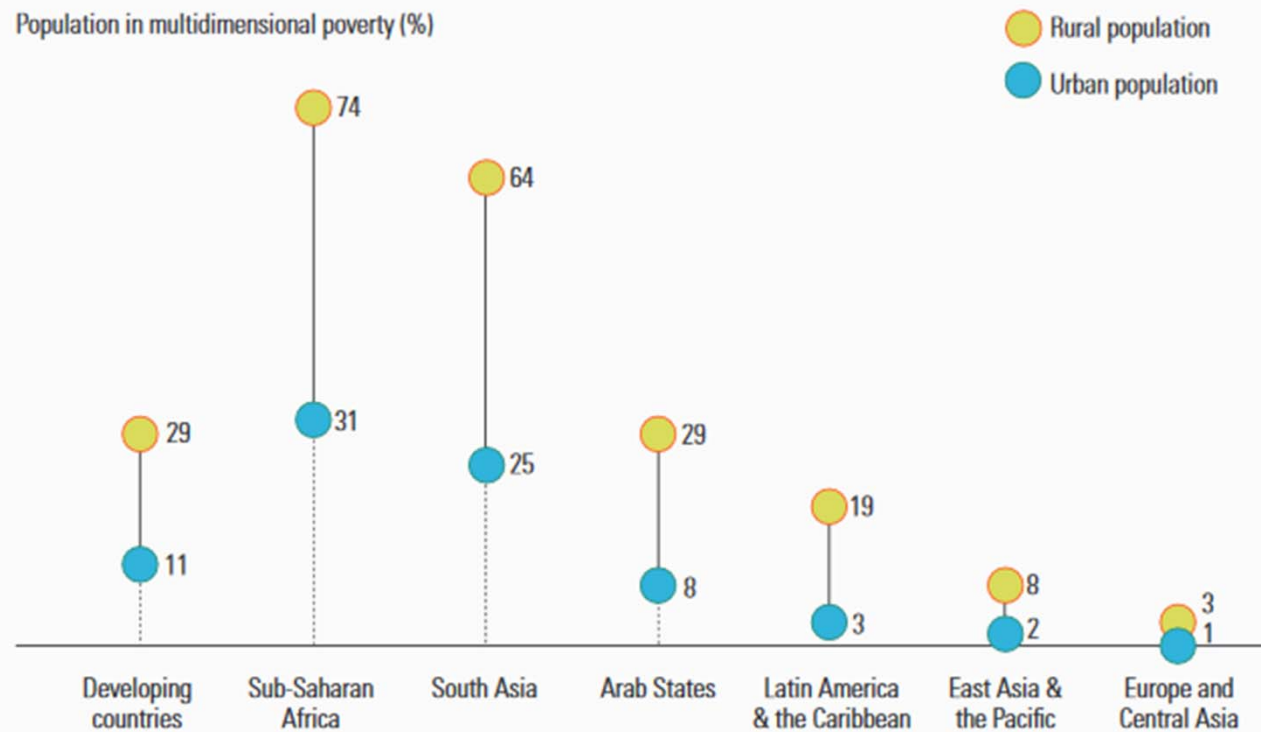
Global wealth has become far more concentrated



Source: Human Development Report Office estimates based on Milanović (2016).

Continental distribution of multidimensional (health/education/standard of living) rural and urban poverty

People in rural areas are far more likely than people in urban areas to be multidimensionally poor



Source: Human Development Report Office.

Review of the water quality of surface waters in Asia, Africa and Latin America in 2016

- **Health risk due to pathogene pollution**

1/3 of total streamflow length severely polluted, approx.

300 million people with direct contact to polluted water

2/3 of the total streamflow length shows a trend of increasing pathogene pollution

Main reason: sewerage but untreated waste water discharged into watercourses

- **Risk to food security due to organic and salinity pollution**

1/7 of total streamflow length is heavily polluted

2/3 of the total streamflow length shows an increasing trend of organic pollution

1/10 of total streamflow length have medium or high salinity status

1/3 of total streamflow length shows an increasing salinity pollution

Consequence: disappearing fish habitat, lack of good quality water for irrigation

Source: UNEP, 2016: Snapshot of the world's water quality: Towards a global assessment

Accelerating Trend of Urbanisation

The accelerating spiral:
Average size of the world's 100
largest cities

Year	Population	Rate of increase
1800	200.000	3,5 fold
1900	700.000	9,0 fold
2000	6.200.000	?

How many people must remain in the rural environment? Good estimate: % of people needed to produce our food

In 2000 **16**, in 2016 **36** cities have more than 10 million, (12 more than 20 million and 2 more than 30 million) inhabitants. Total: **ca. 628** million people **8%** of the world population.

Urbanisation means massive land use changes, increase of exposure of wealth and people to hazards, susceptibility and consequently that of vulnerability.

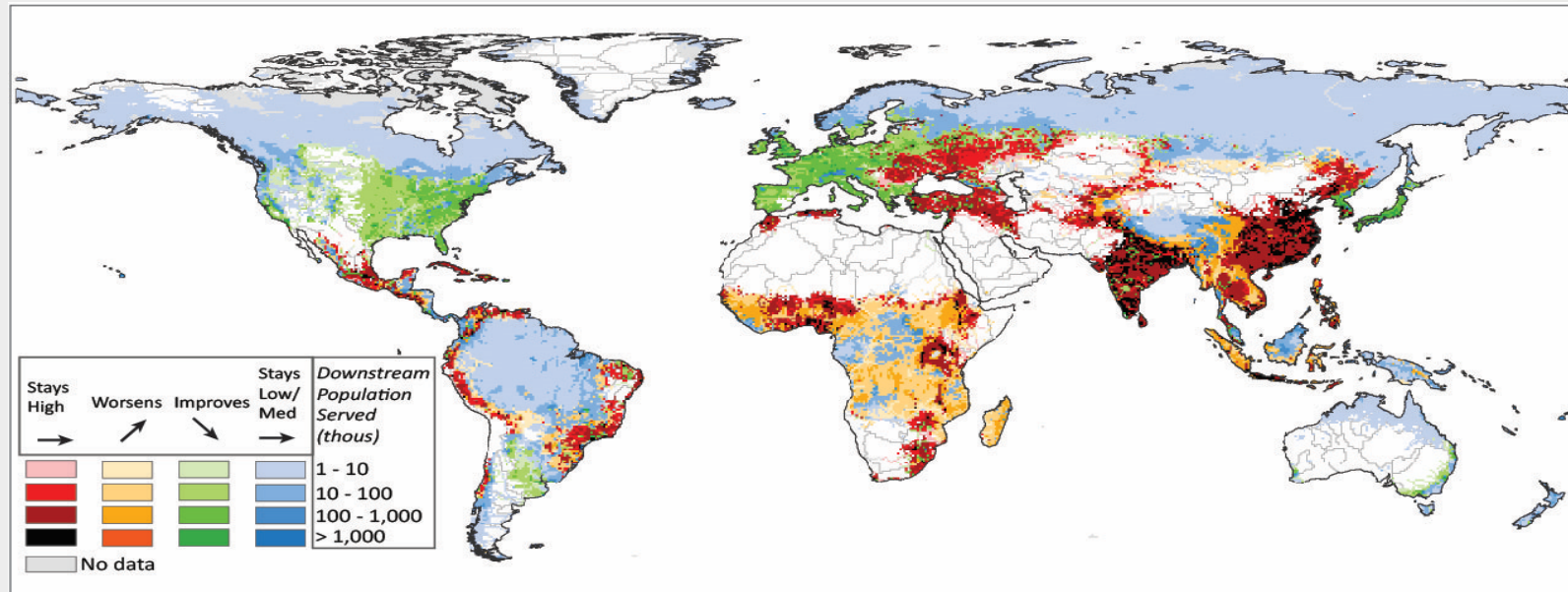
The disturbing global status quo: Poverty, Inequity (*water relevance*): how can the SDGs address it?

- **1 Billion Subsistence Farmers** (*irrigation & drainage*)
- 1 Billion Undernourished People (*irrigation & drainage*)
- 2 Billion People with Dietary Deficiencies (*water and food security*)
- **1 Billion Slum Dwellers*** (*water hygiene & water-borne diseases*)
- 1 (2) Billion People without Access to Safe Drinking Water (*water supply*)
- 2 (4) Billion People without Adequate Sanitation (*canalisation & waste water treatment*)
- 1 Billion People without Access to Electricity (*hydropower, cooling water*)

Even with obvious „multiple counting“ this implies that at least one third of humanity is excluded from „development“.

* 60% of urban population in Africa belongs to this category /DFID 2015/
() Numbers mentioned by President J. Áder during the Budapest Water Summit

A Global Perspective on Freshwater Services Delivered for Human Water Security



Map depicts where HWS threat on water sources supporting downstream people have stayed high (red), worsened from Med/Low to High threat (orange), improved from High to Low/Med threat (green) or stayed under Low/Med threat (blue). **"GOING GREEN" COSTS THOSE COUNTRIES 750 BILLION US\$/year!**

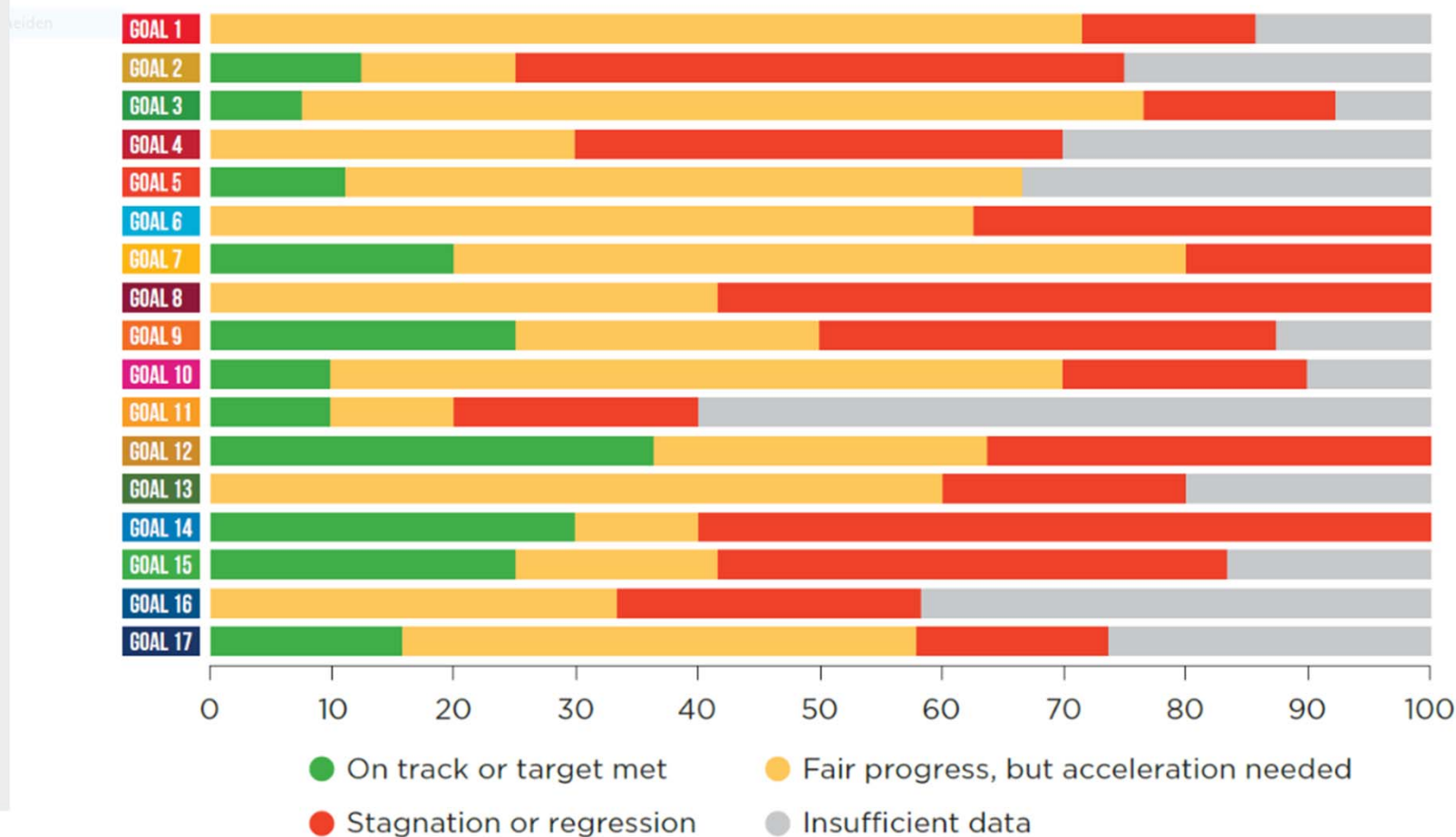
Global Environmental Change Pamela Green, C. Vörösmarty et al.2015

The key option for water resources management: storage

- Dams & reservoirs are not without serious environmental impacts and virtually irreversible once built
- Yet without additional (spatially well distributed and well managed) storage space the consequences of Climate Change would further deteriorate the reliability to have adequate access to and enough water to satisfy the needs of the competing user sectors
- Dams & reservoirs require careful design, massive financial resources, monitoring of flows, water quality, sedimentation, operation and maintenance and sustainable multi-stakeholder consensus to achieve this
- Example: the aggregate live storage of Kariba and Cahora Bassa reservoirs on the Zambezi is 116.6 km^3 (equals to the total annual stream flow volume of the river at its mouth) but these dams are for the time being single purpose, serving exclusively for hydropower generation. For improved food security in Southern Africa their operation should be re-examined and potentially modified
- Reservoirs (also new ones) are needed also for inter-basin transfer, to capture the hydropower potential and to realize the irrigation potential in agriculture, especially in Africa

Assessment of the implementation of the 17 SDGs (UN DESA 2023)

Progress assessment for the 17 Goals based on assessed targets, 2023 or latest data (percentage)



The SDGs: uncertain perspectives

- **Green** on track or target met 13%
- **Yellow** fair progress, but acceleration needed 41%
- **Red** stagnation or regression 29.5%
- **Grey** insufficient data to judge 16.5%

After 9 years (out of 15) the level of implementation of the SDGs is most likely insufficient to achieve all 17 goals and their 169 targets

Yet, the SDGs are adopted by the Member States of UN and summarize our aspirations towards a more sustainable and just world!

Conclusions

- Water discourse and implementation reality deviate from each other quite remarkably
- Aquatic biodiversity is likely to be the „first victim“ of even „green solutions“
- We cannot speak about sustainability as long as 1/3 of humanity live in „undignified“ conditions violating basic human rights
- Urbanization is expected to continue and has some (hidden) potential to address the „P“ challenges, but its present unregulated version rather harms the chances of progress
- Unabated population growth is likely to jeopardize the achievement of most of the SDGs
- Only pollution can be directly addressed by engineering, but this is rather a syndrome than the root cause

THANK YOU FOR YOUR ATTENTION !