Transboundary Water Cooperation

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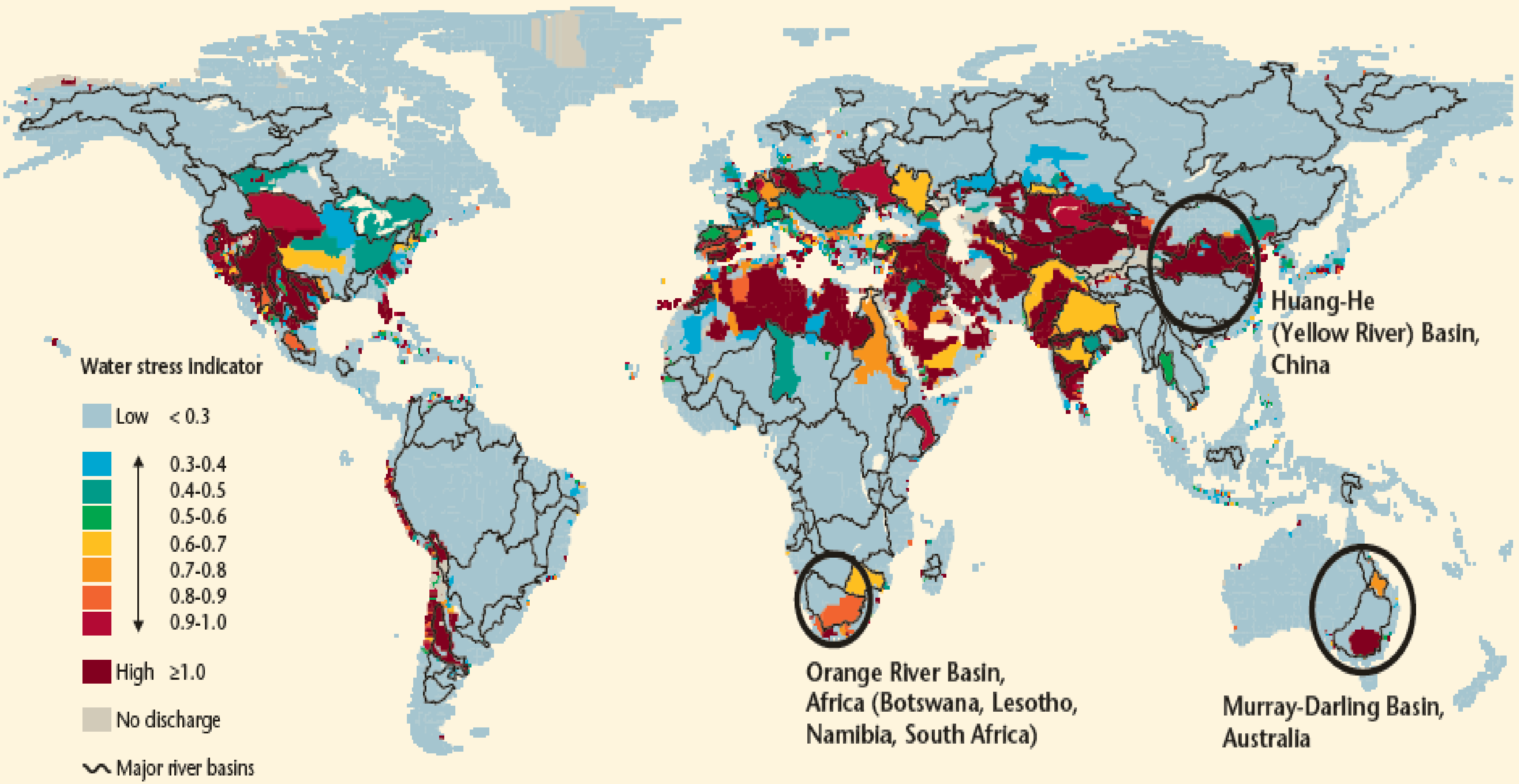
Sanitation and access to clean water
Development
Agriculture
Energy
Pollution
Maintaining ecosystem services
Weather extremes

Map 6.3 **Water stress level of major river basins, around 2002**



Source: Based on Smakhtin, Revenga, and Döll 2004.

Table 1 Groundwater use by country[a]

Country	Total groundwater withdrawals (km^3)	Total renewable groundwater resources (km^3)	Percent of withdrawals to total renewable groundwater resources	Percent of national share of global withdrawals
India	190	419	45.3	28.9
United States	110	1,300	8.5	16.7
Pakistan	60	55	109.1	9.1
China	53	828	6.4	8.1
Iran	53	49	108.2	8.1
Mexico	25	139	18.0	3.8
Saudi Arabia	21	2.2	954.5	3.2
Italy	14	43	32.6	2.1
Japan	14	27	51.9	2.1
Bangladesh	11	21	52.4	1.7
Brazil	8	1,874	0.4	1.2
Turkey	8	68	11.8	1.2
Uzbekistan	7	9	77.8	1.1
Germany	7	46	15.2	1.1
Egypt	7	2	350.0	1.1
France	6	100	6.0	0.9
Spain	5	30	16.7	0.8
Bulgaria	5	6	83.3	0.8
Argentina	5	128	3.9	0.8
Libya	4	0.5	800.0	0.6
Rest of the world	76	6,135	1.2	11.6
Total	658	11,282	5.8	100.0

[a]Sources: FAO, AQUASTAT (http://www.fao.org/nr/water/aquastat/main/index.stm; 40, 41).

Global Water Pollution Loads for Nitrogen 1970, 2000, 2050

C. Liu et al. / Ecological Indicators 18 (2012) 42–49

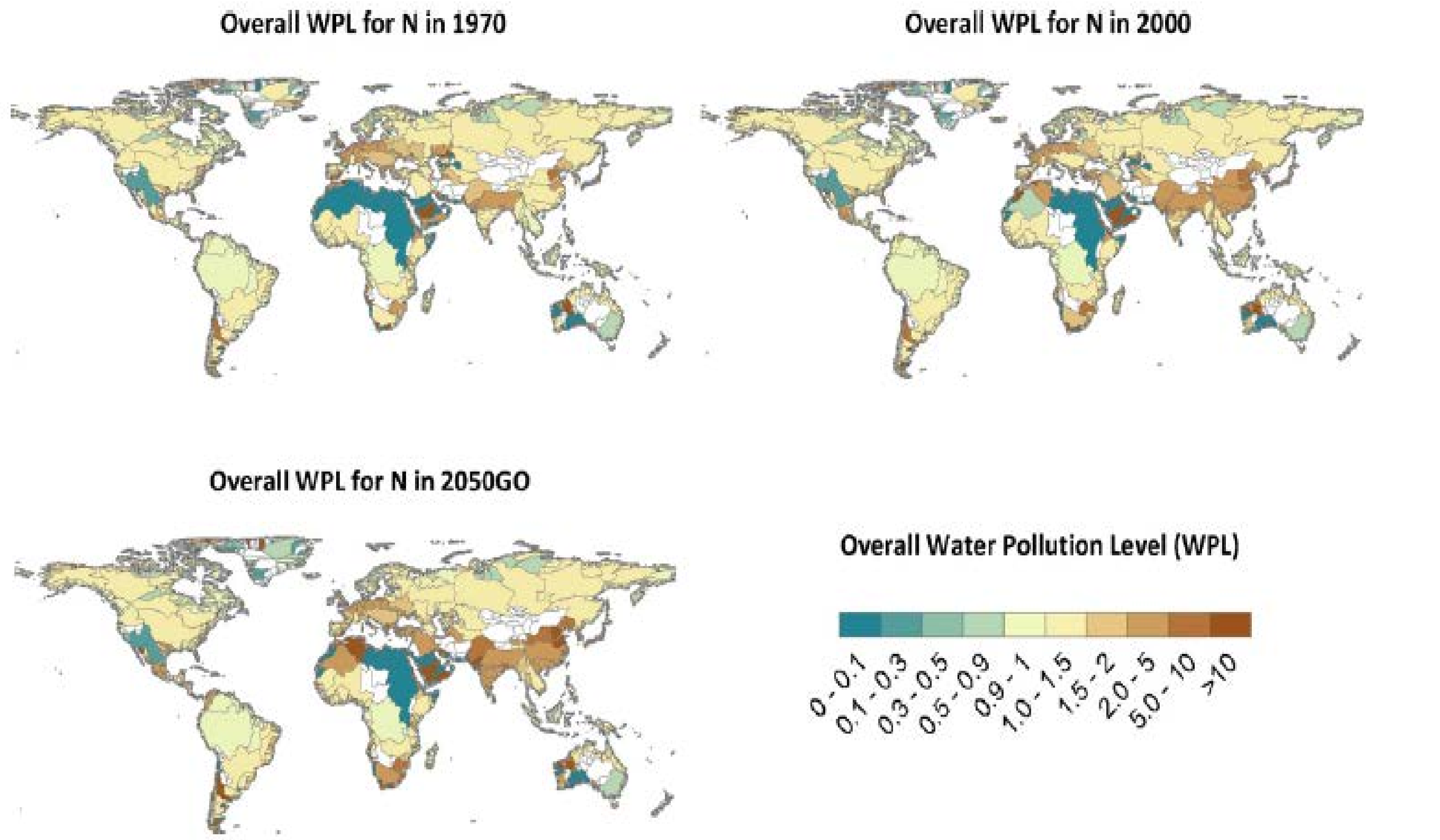


Fig. 3. Overall water pollution levels (WPLs) of major world rivers in the years 1970, 2000 and for 2050 for the global orchestration (GO) scenario for nitrogen.

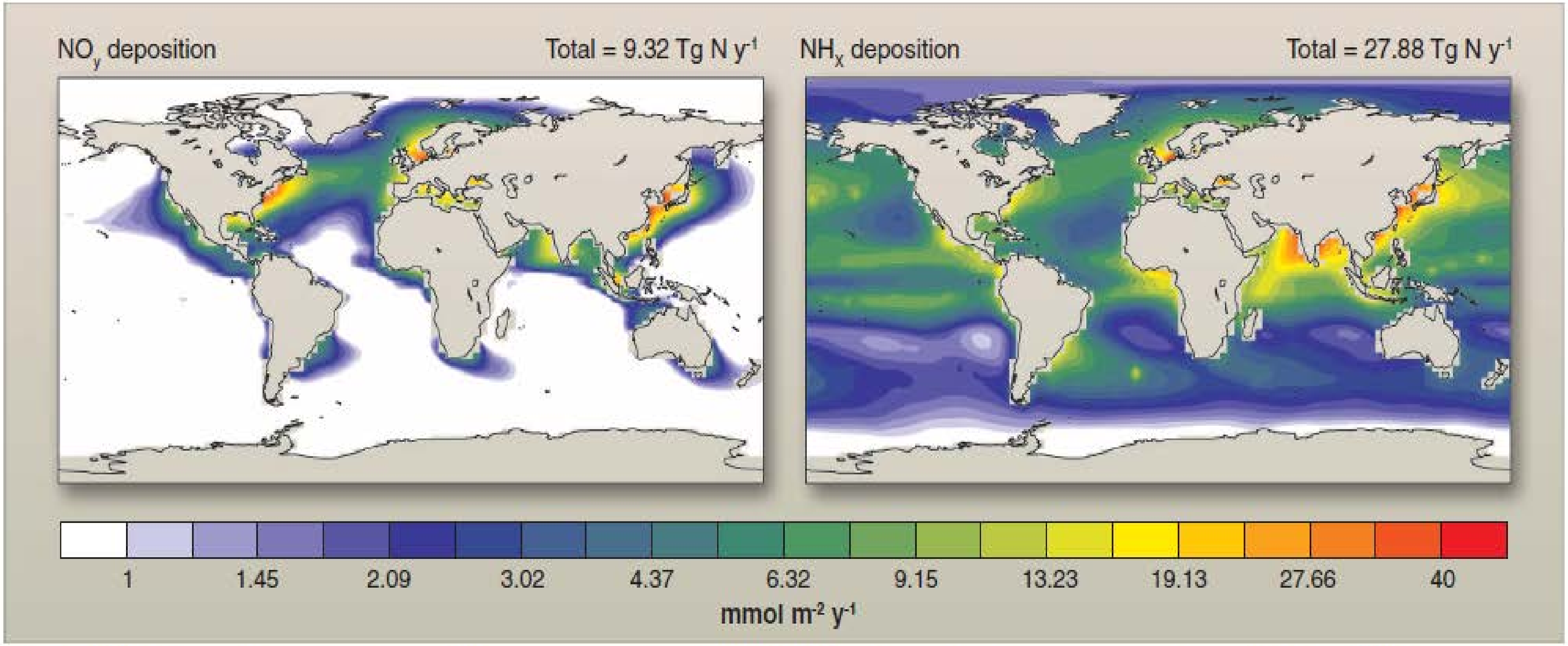
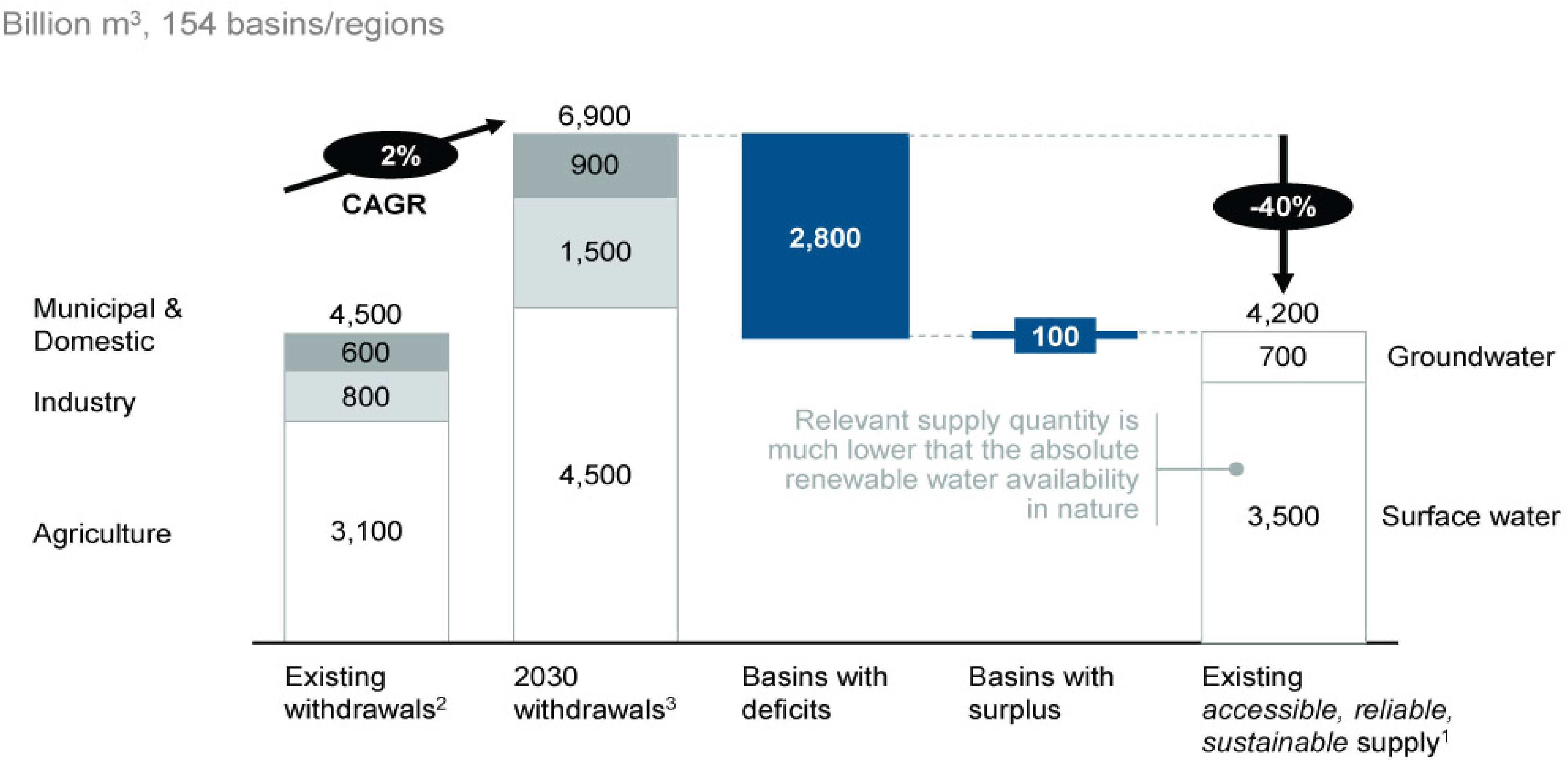


Fig. 3. Model estimated deposition fluxes of anthropogenic reactive nitrogen (mol N m^{-2} $year^{-1}$) to the ocean surface for oxidized forms (NO_y), primarily from fossil fuel combustion sources, and reduced forms (NH_x) primarily from agricultural sources. [Adapted from (*30*)]

Future demand for water will outstrip our capacity[1] to provide it

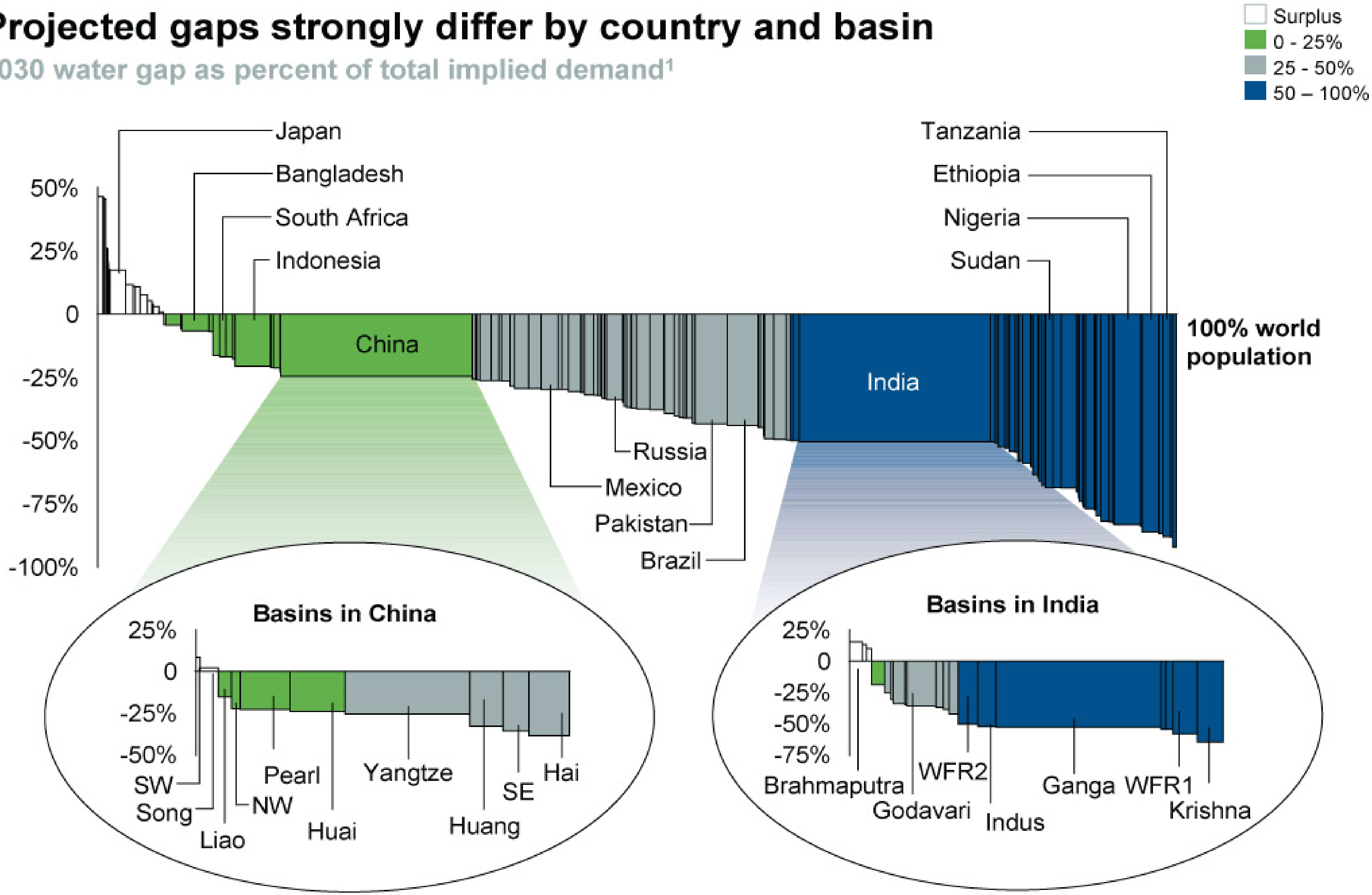


1 Existing supply which can be provided at 90% reliability, based on historical hydrology and infrastructure investments scheduled through 2010; net of environmental requirements
2 Based on 2010 agricultural production analyses from IFPRI
3 Based on GDP, population projections and agricultural production projections from IFPRI; considers no water productivity gains between 2005-2030

Source: 2030 Water Resources Group, "Charting Our Water Future: Economic frameworks to inform decision-making", McKinsey & Company 2009, p.6. (U)

Projected gaps strongly differ by country and basin

2030 water gap as percent of total implied demand[1]



1 2030 projections, assuming technological innovation and infrastructure improvement investments are frozen at 2010 levels

2030 Water Resources Group, "Charting Our Water Future: Economic frameworks to inform decision-making", McKinsey & Company 2009, p.49. (U)

Table 3. The number of CBUs that have each treaty component and RBO presence/absence, globally and by World Bank region, with the percentage of the total CBUs for each region in parentheses

	World Bank Region (Total # of CBUs in each region)							
Individual Treaty and RBO components	**Africa** *(186)*	**East Asia and the Pacific** *(68)*	**Europe and Central Asia** *(137)*	**Latin America and Caribbean** *(151)*	**Middle East and North Africa** *(39)*	**South Asia** *(23)*	**Combined High Earning Economies** *(139)*	**Total** *(747)*[a]
At least one water treaty	101 (54%)	21 (31%)	80 58%)	56 (37%)	16 (41%)	9 (39%)	106 (76%)	389 (52%)
Allocation mechanism	49 (26%)	13 (19%)	26 (19%)	20 (13%)	13 (33%)	6 (26%)	80 (58%)	207 (28%)
Variability management mechanism	40 (22%)	12 (18%)	38 (28%)	9 (6%)	5 (13%)	5 (22%)	48 (35%)	157 (21%)
Conflict resolution mechanism	70 (38%)	12 (18%)	56 (41%)	22 (15%)	10 (26%)	5 (22%)	86 (62%)	261 (35%)
At least one river basin organization	80 (43%)	10 (15%)	30 (22%)	40 (26%)	6 (15%)	5 (22%)	75 (54%)	246 (33%)

[a] The total here includes the four CBUs classified as N.A. mentioned in footnote 4 on page 4, but these CBUs are not included in any of the data below.


KAZAKHSTAN
Tashkent
UZBEKISTAN
KYRGYZSTAN
TAJIKISTAN
Dushanbe
CHINA
TURKMENISTAN
Amu Darya
HINDU KUSH
CHITRAL
Chitral
SKARDU
NWFP
Nanga Parbat (8 100m)
Rakaposhi (7 800m)
K2 (8 600m)
Aksai Chin
Chinese Line
Indian Line
Jammu and Kashmir
KASHMIR VALLEY
HIMALAYAS
Kabul
AFGHANISTAN
Helmand Rod
Tarbela
Attock
Islamabad
Mangla
Salal
Baglihar
Anant Nag
Akhnoor
Head Marala
Tandi
Chashma
Sargodha
Lower Chenab Canal
HIMACHAL PRADESH
Pong
Bhakra
Pandoh
Nangal
Trimmu Barrage
Taunsa Barrage
Sidhnai Barrage/ Canal
Sirhind Canal
Ferozepur
Haveli
PUNJAB
Punjnad Barrage
PAKISTAN
NEPAL
New Delhi
Lake Manasarovar
Jacobabad
Guddu Barrage
Larkana
Sukkur Barrage
KIRTHAR
INDIA
SINDH
Nawabshah
Kotri Barrage
Arabian Sea
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.
Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.
Indus river basin
Legend
International boundary
Administrative boundary
Line of Control
Capital, town
Lake
Intermittent Lake
Salt Pan
Zone of irrigation development
Dam, Barrage
River
Canal
River basin
0 75 150 300 450 km
Albers Equal Area Projection, WGS 1984
FAO - AQUASTAT, 2011
Disclaimer
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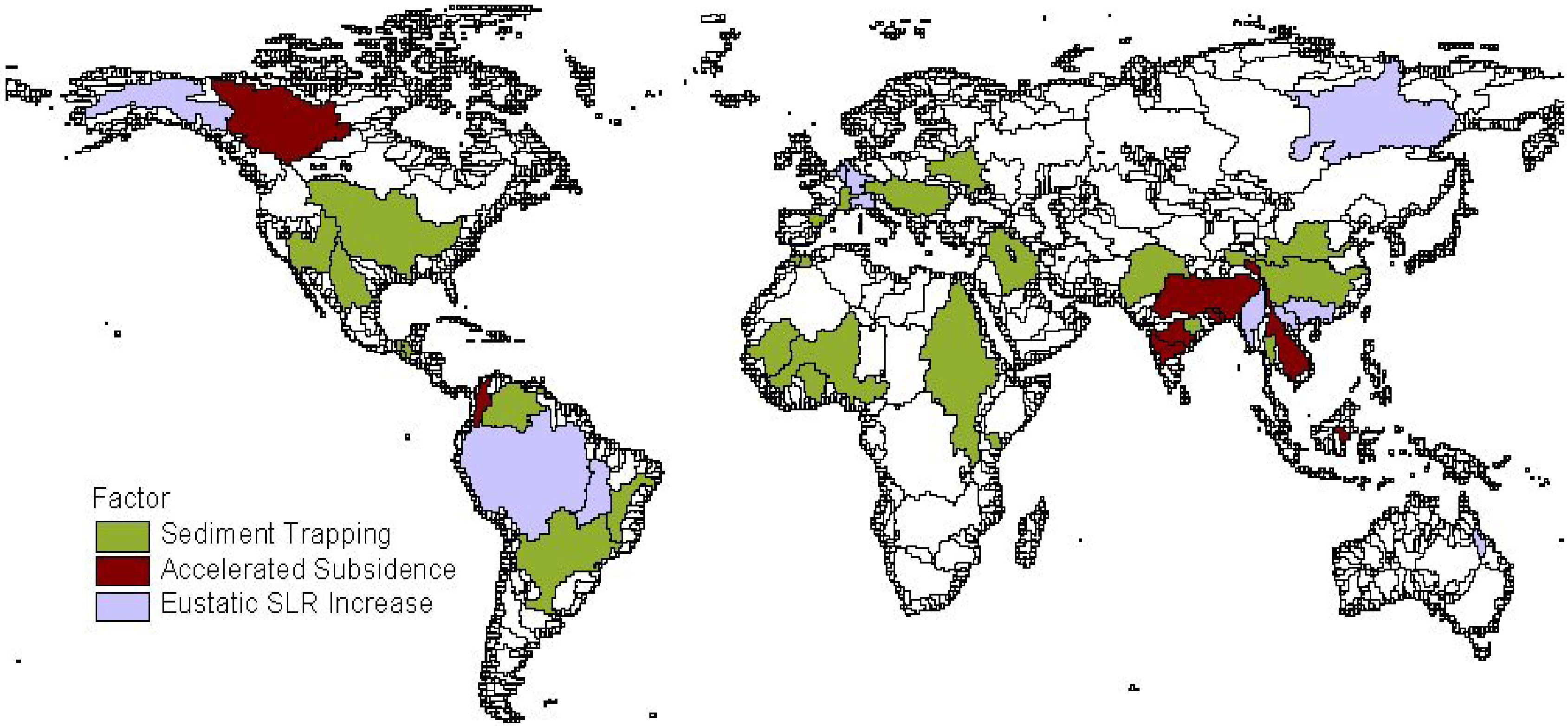
Deltas at Risk



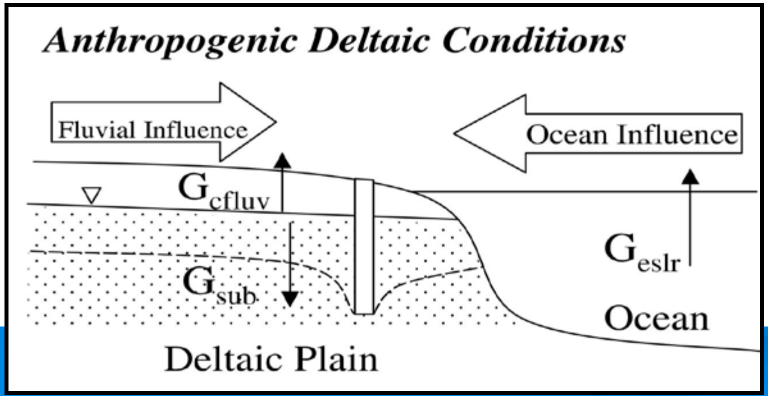
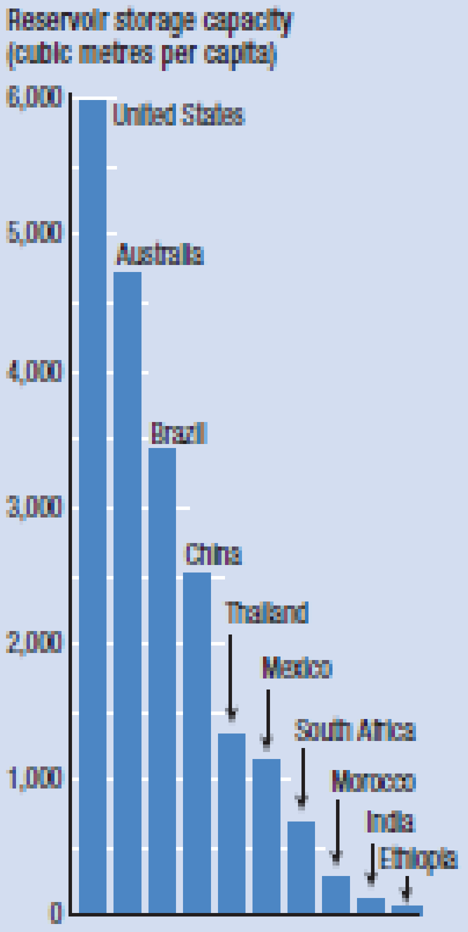


Figure 4.8 **Large inequalities in risk mitigation capacity**



Source: World Bank 2005c.

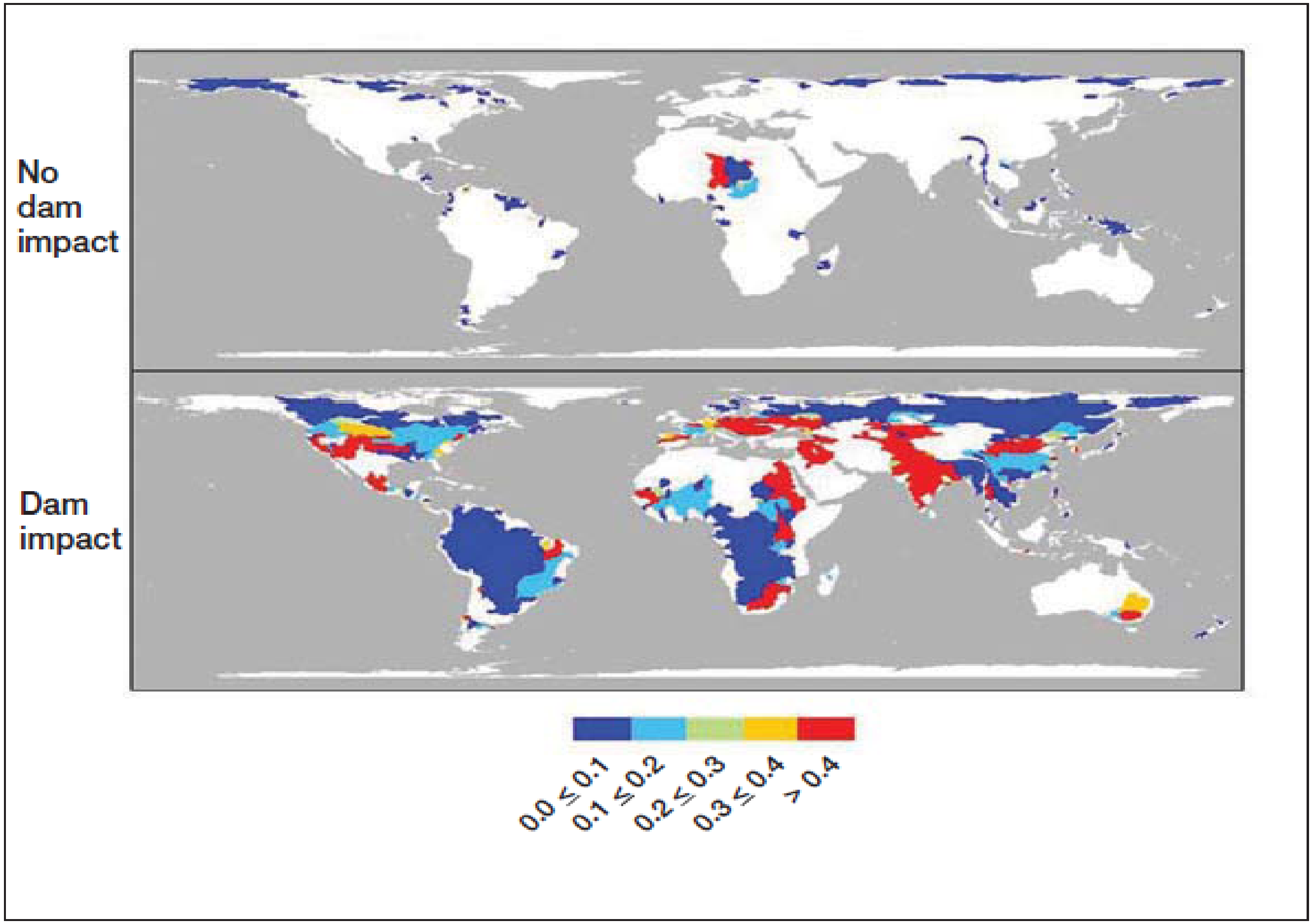


Figure 2. *Water stress as indicated by withdrawal-to-availability ratios computed for 2050s. Withdrawals refer to water abstracted from rivers for domestic, industry, and agriculture sectors. Assumptions for socioeconomic and climate-change driving forces come from the A2 IPCC scenario and the HadCM3 climate model output. Results across all climate model outputs and IPCC scenarios did not differ notably. Higher water stress is shown in red; lower water stress is shown in blue.*