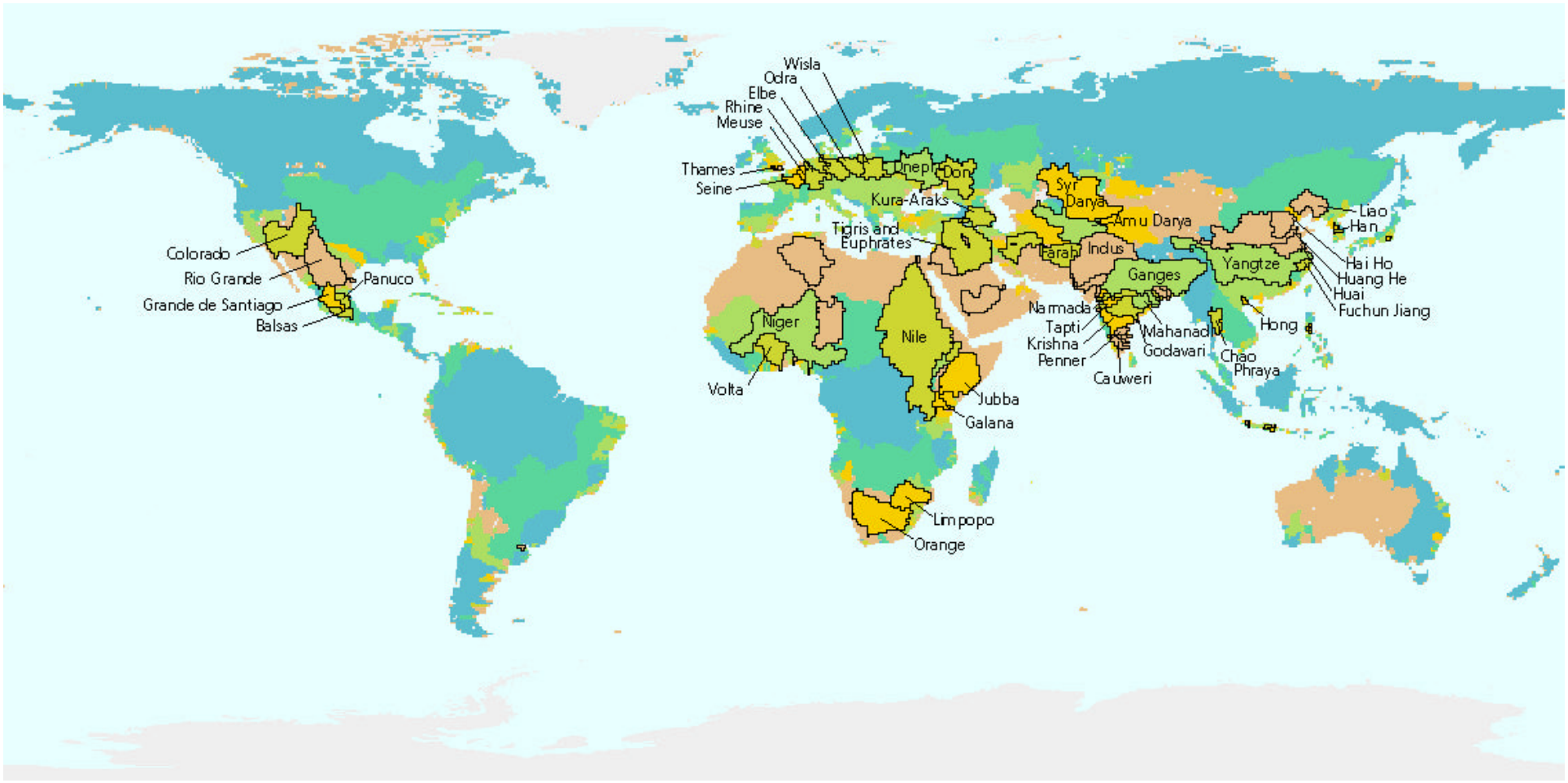
Projected Annual Renewable Water Supply Per Person by River Basin, 2025



Map Projection: Geographic

Citation: World Resources Institute - PAGE, 2000

Notes:

Outlined basins are projected to have a population of more than 10,000,000 people in 2025. These basins are also in or approaching water scarcity, with less than 2,500 cubic meters of water per person per year. Unlabled, outlined basins in Africa and the Middle East have no perennial river flowing through them.

Map Description:

This map shows water supply per person for individual river basins. Water experts define areas where per capita water supply drops below 1,700 m3/year as experiencing "water stress" - a situation in which disruptive water shortages can frequently occur. In areas where annual water supplies drop below 1,000 m3 per person per year, the consequences can be more severe and lead to problems with food production and economic development unless the region is wealthy enough to apply new technologies for water use, conservation, or reuse. According to the PAGE analysis, as of 1995, some 41 percent of the world's population, or 2.3 billion people, live in river basins under water stress, with per capita water supply below 1,700 m3/year. Of these, some 1.7 billion people reside in highly stressed river basins where water supply falls below 1,000 m3/year. By 2025, the PAGE analysis projects that, assuming current consumption patterns continue, at least 3.5 billion people - or 48 percent of the world's projected population - will live in water-stressed river basins. Of these, 2.4 billion will live under high water stress conditions. This per capita water supply calculation, however, does not take into account the coping capabilities of different countries to deal with water shortages. For example, high-income countries that are water scarce may be able to cope to some degree with water shortages by investing in desalination or reclaimed wastewater. The study also discounts the use of fossil water sources because such use is unsustainable in the long term.

The results of this analysis also show that of those basins where the projected population is expected to be higher than 10 million by 2025, 6 basins will go from having more than 1,700 m3 to less than 1,700 m3 of water per capita per year. These basins are the Volta, Farah, Nile, Tigris and Euphrates, Narmada, and the Colorado River basin in the United States. Another 29 basins will descend further into scarcity by 2025, including the Jubba, Godavari, Indus, Tapti, Syr Darya, Orange, Limpopo, Huang He, Seine, Balsas, and the Rio Grande.

Analytical Overview:

This map was developed by combining a global population database for 1995 that uses census data for over 120,000 administrative units (CIESIN et al. 2000) and a global runoff database developed by the University of New Hampshire and the WMO/Global Runoff Data Centre (Fekete et al. 1999). The runoff database combines observed discharge data from monitoring stations with a water balance model driven by climate variables such as temperature, precipitation, land cover, and soil information. For those regions where discharged data were available, the modeled runoff was adjusted to match the observed values; for regions with no observed data the modeled estimates of runoff were used (Fekete et al. 1999). The 2025 estimates are considered conservative because they are based on the United Nations' low-range projections for population growth, which has population peaking at 7.2 billion in 2025 (UNPD 1999:3). In addition, a slight mismatch between the water runoff and population data sets leaves 4 percent of the global population unaccounted for in this analysis.

Source:

1. Center for International Earth Science Information Network (CIESIN); Columbia University; International Food Policy and Research Institute; and World Resources Institute. 2000, Gridded Population of the World, Version 2. Palisades, NY: CIESIN, Columbia University.Available On-line at: http://sedac.ciesin.org/plue/gpw. 2. Fekete, B., C.J. Vörösmarty, and W. Grabs. 1999, Global, Composite Runoff Fields Based on Observed River Discharge and Simulated Water Balance. Koblenz, Germany: WMO-GRDC. . .