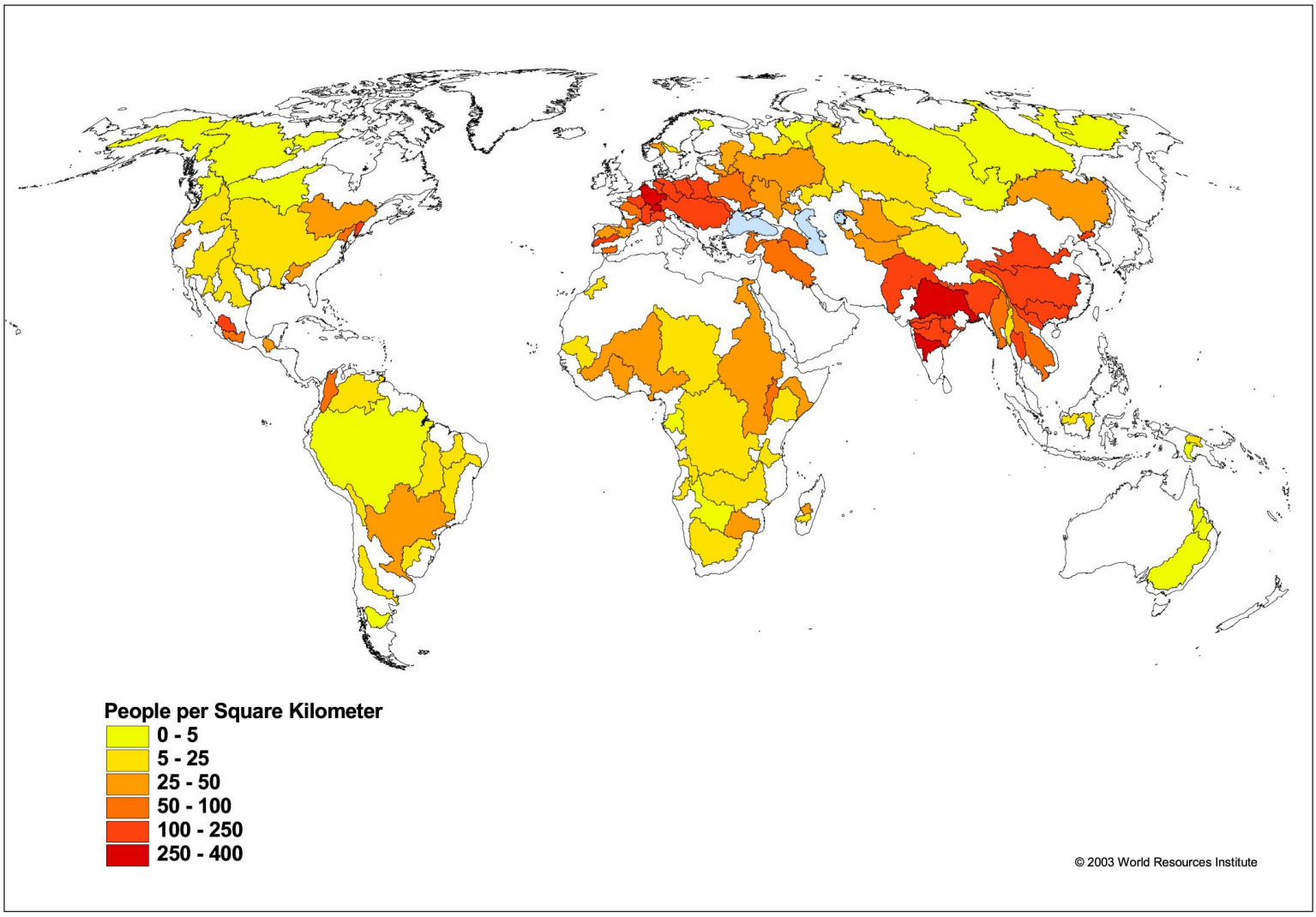
Watersheds of the World : Global Maps

13. Average Population Density by Basin



Map Description

This map shows the population density by basin expressed as people per square kilometer. The most densely populated basins are found in India, China, Central America, and parts of Europe. In Africa the most populated basins are Lake Turkana, Niger, Nile, Mangoky, Limpopo, Shaballe, and Volta. In South America the most populated basins are the Paraná and the Magdalena.

Population growth, industrialization, urbanization, agricultural intensification, and water-intensive lifestyles are placing greater stress on freshwater systems, with both water use and pollution driving the scarcity of useable water. Over the past century world water withdrawals increased almost twice as fast as population growth. Increased populations will require increased food production, and therefore, countries will need to either expand irrigation and cropland areas, or increase yields with the addition of fertilizers. Both these alternatives will put additional pressures on freshwater ecosystems.

Global concerns about water scarcity include not only surface water sources but groundwater sources. Highly populated cities such as, Bangkok, Manila, Beijing, Mexico City, Madras, and Shanghai, which have relied on groundwater aquifers for hundreds of years, are already experiencing serious aquifer declines— in some cases between 10 to 50 meters.

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Some of this water is fossil water (ancient water that isn't routinely replenished) that comes from deep sources isolated from the normal runoff cycle, but much groundwater comes from shallower aquifers that draw from the same runoff that feeds freshwater ecosystems. Over-drafting of groundwater sources can rob streams and rivers of a significant fraction of their flow. In the same way, pollution of aquifers by nitrates, pesticides, and industrial chemicals often affects water quality in adjacent freshwater ecosystems (Revenga et al. 2000.)

Mapping Details

The Gridded Population of the World (GPW) database was used to calculate average population density by river basin. The GPW dataset was compiled from the latest available census data for over 120,000 administrative units worldwide, at a variety of subnational district levels. The population figures were standardized to 1995. The polygon data were converted to 2.5' grid with an assumption that the population is evenly distributed within a census unit. The total number of people in each basin was calculated using the grid data, and then divided by the total area of the basin to calculate the average population density. Data are presented as people per square kilometer.

Map Projection

Robinson

Sources

CIESIN (Center for International Earth Science Information Network), International Food Policy Research Institute, and World Resources Institute. 2000. Gridded Population of the World, Version 2. Palisades, New York: CIESIN and Columbia University.
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