

Water Security in River Basins in South Asia

**Prof. Cecilia Tortajada
School of Social and
Environmental Sustainability,
Glasgow, UK**

**Smart Water Management in Large
River Basins, IWRA Congress**

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Smart water management

High-technology solutions for the water sector include digital meters and sensors, supervisory control and data acquisition (SCADA) systems, and geographic information systems (GIS).

- **Real-time Hydrological Data Acquisition and Processing System** gathers water level, water quality, and other data via satellite imaging and other communication technologies.
- **Precipitation Forecasting System** measures and predicts rainfall.
- **Flood Analysis System** provides real-time flood analysis for flood control.
- **Reservoir Water Supply System** optimizes water supply by estimating demand.
- **Generation Integrated Operation System** monitors dam and weir operations remotely.
- **Satellite-based Flood Forecasting and Warning Equipment** provides flood forecasts and early warning through satellite data.
- **Water Disaster Monitoring System** offers monitoring of hydrological data through a (geographic information system) GIS, CCTV cameras, and other tools.

Kwater, <https://development.asia/case-study/sustainable-water-management-smart-cities>

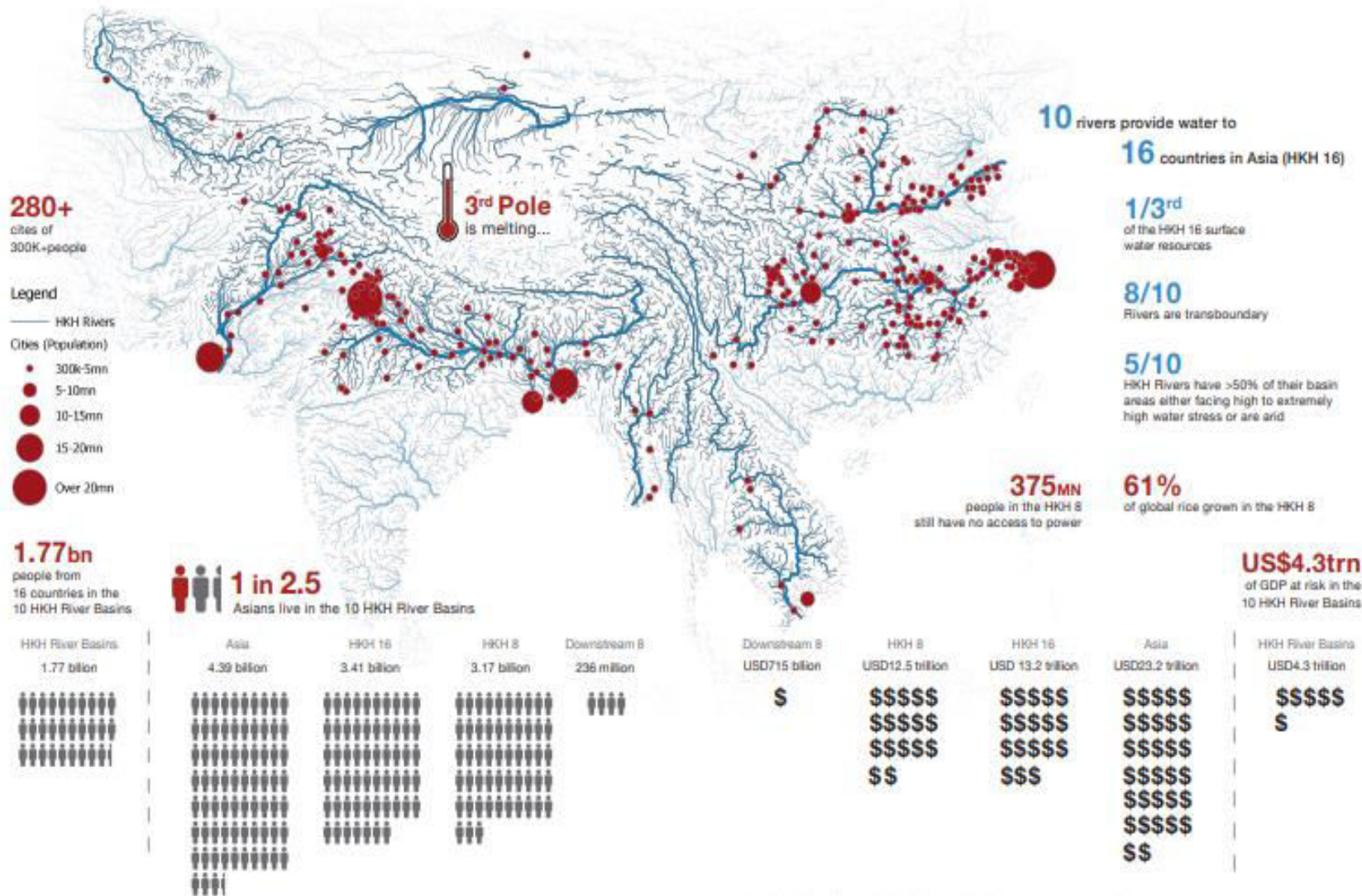
Global Population Density

The height of the spikes relates to the number of people living in an area - roughly 2km x 2km



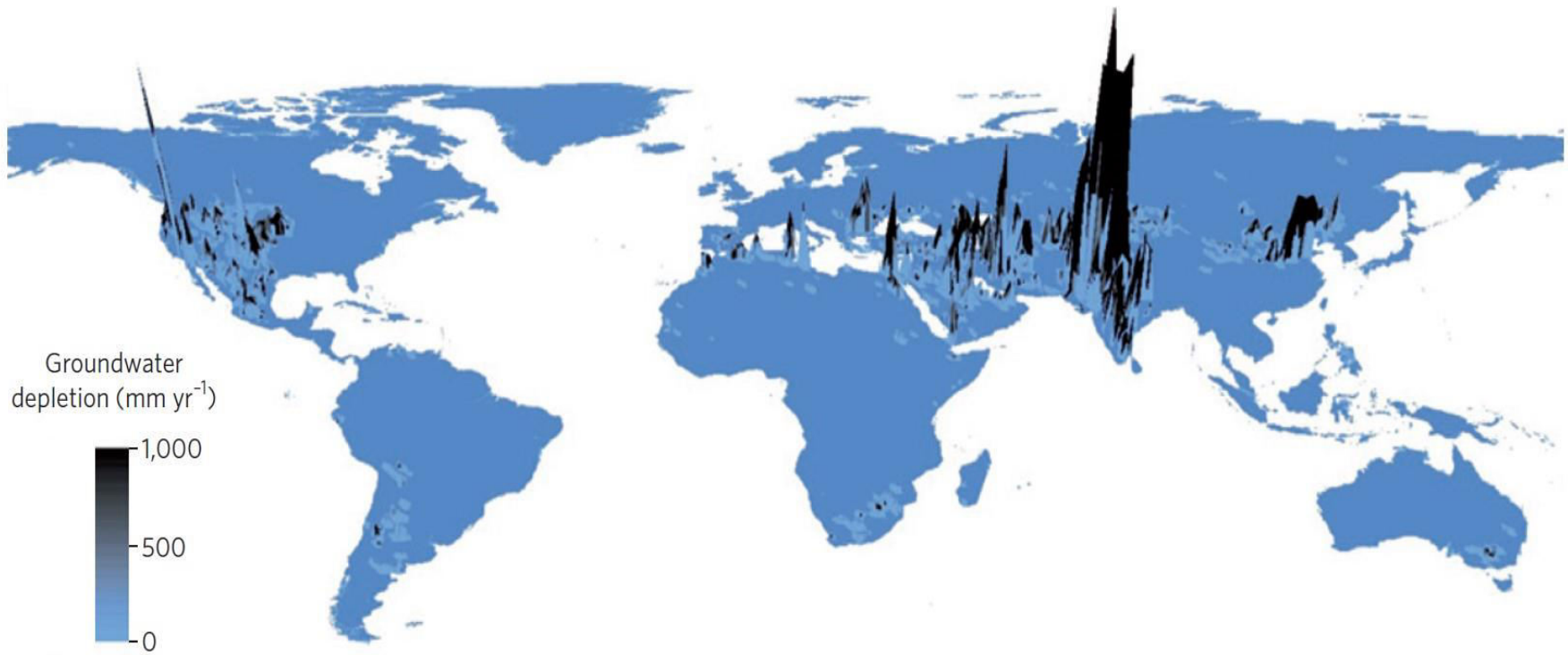
Population: 1.92 billion people

ASIA'S WATER CHALLENGE



Sources: China Water Risk report “No Water, No Growth - Does Asia have enough water to develop?” 2018.

<https://bit.ly/2OEc9J3>

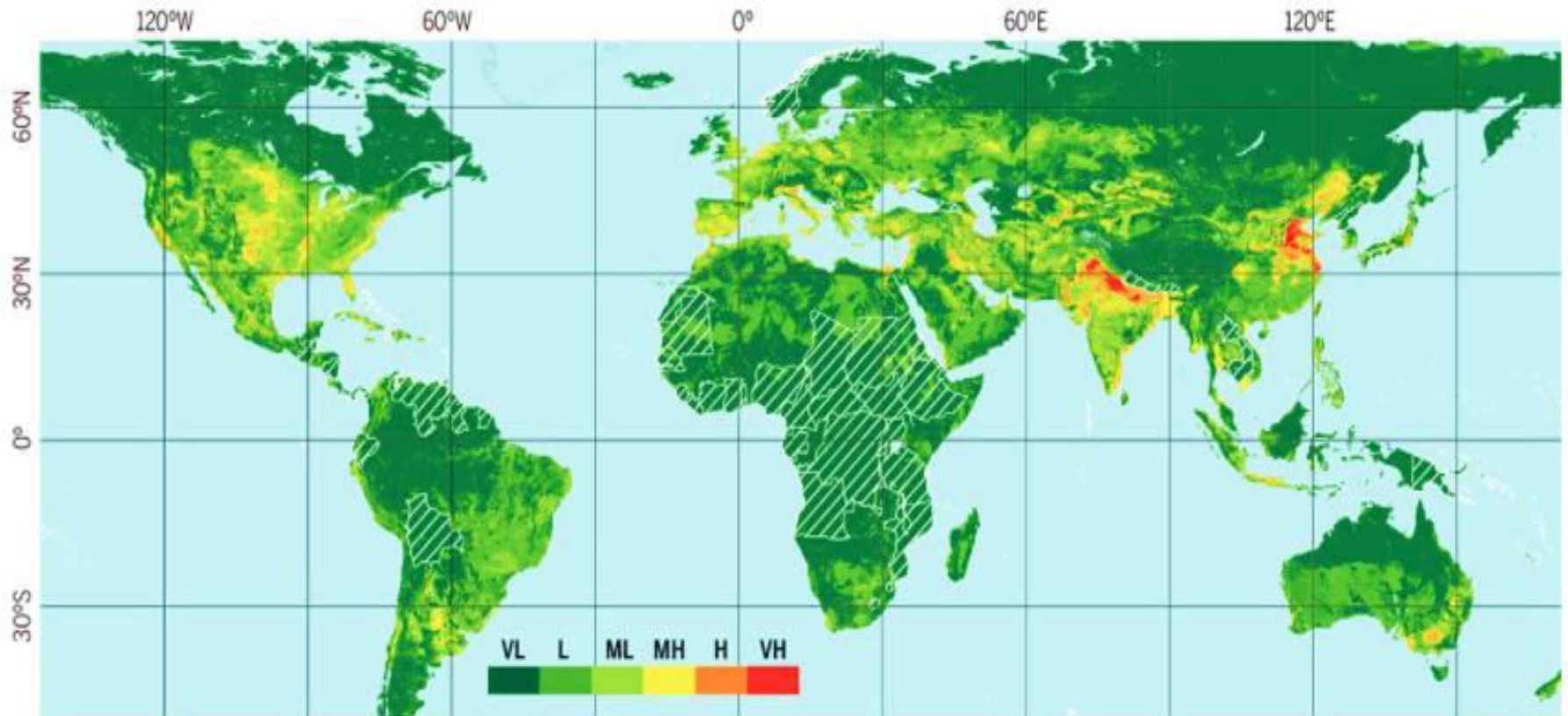


Estimate of the global distribution of groundwater depletion

The three dimensional topography shows 'mountains of groundwater depletion' especially in the United States, Mexico, Saudi Arabia, Pakistan, India and China.

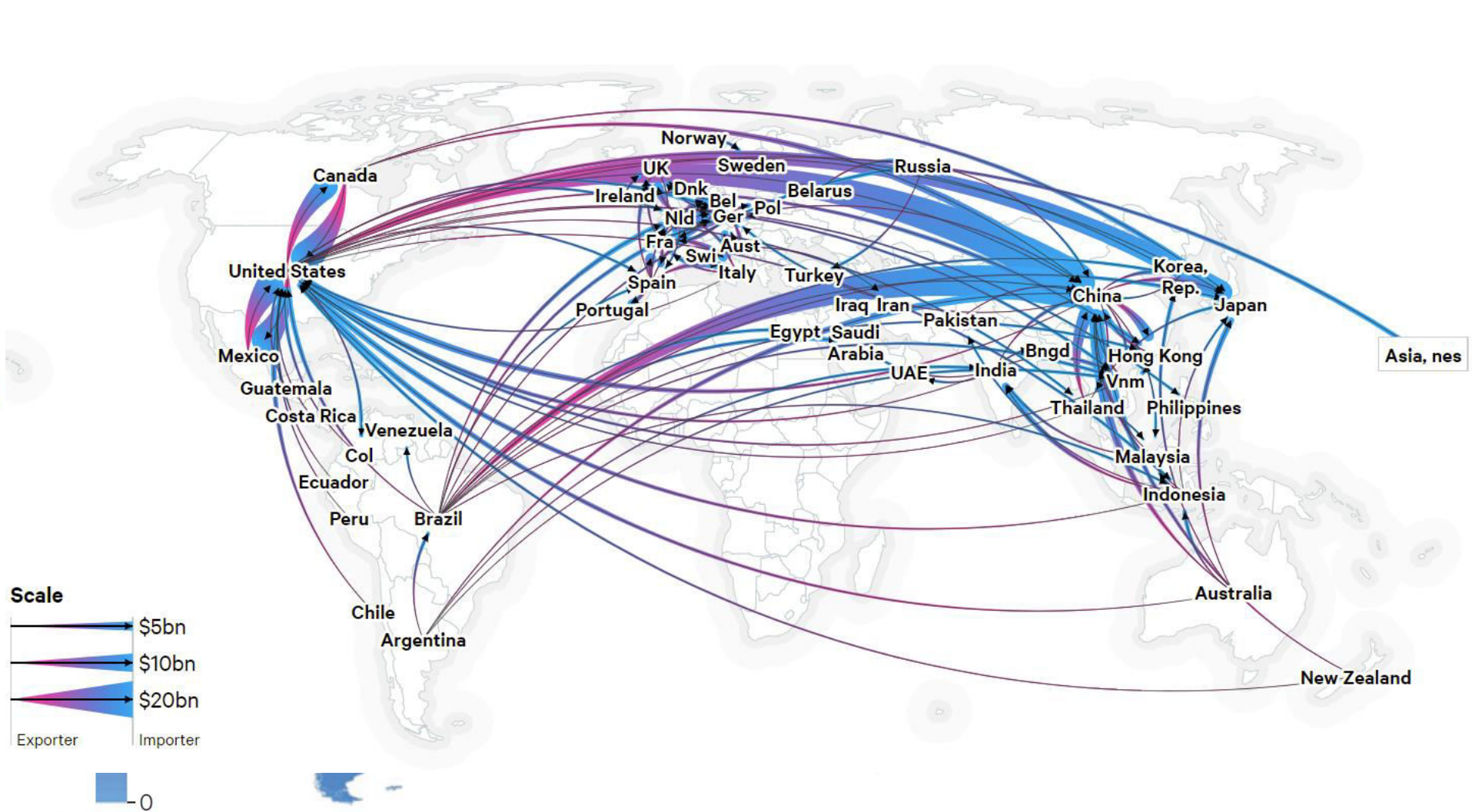
Sources: Wada et al. (2012) and Werner and Gleeson (2012).

International UNESCO research team to publish the first global subsidence map



A new global map, published in [Science](#) shows that land subsidence as a result of the depletion of our groundwater resources is a global anthropogenic hazard that produces relevant environmental, social and economic impacts. According to the researchers, nineteen percent of the global population and twelve percent of the global gross domestic product may face a high probability of subsidence. Eighty six percent of the exposed global population lives in Asia, and by 2040 the subsidence threat may increase flooding risk for 635 million inhabitants.

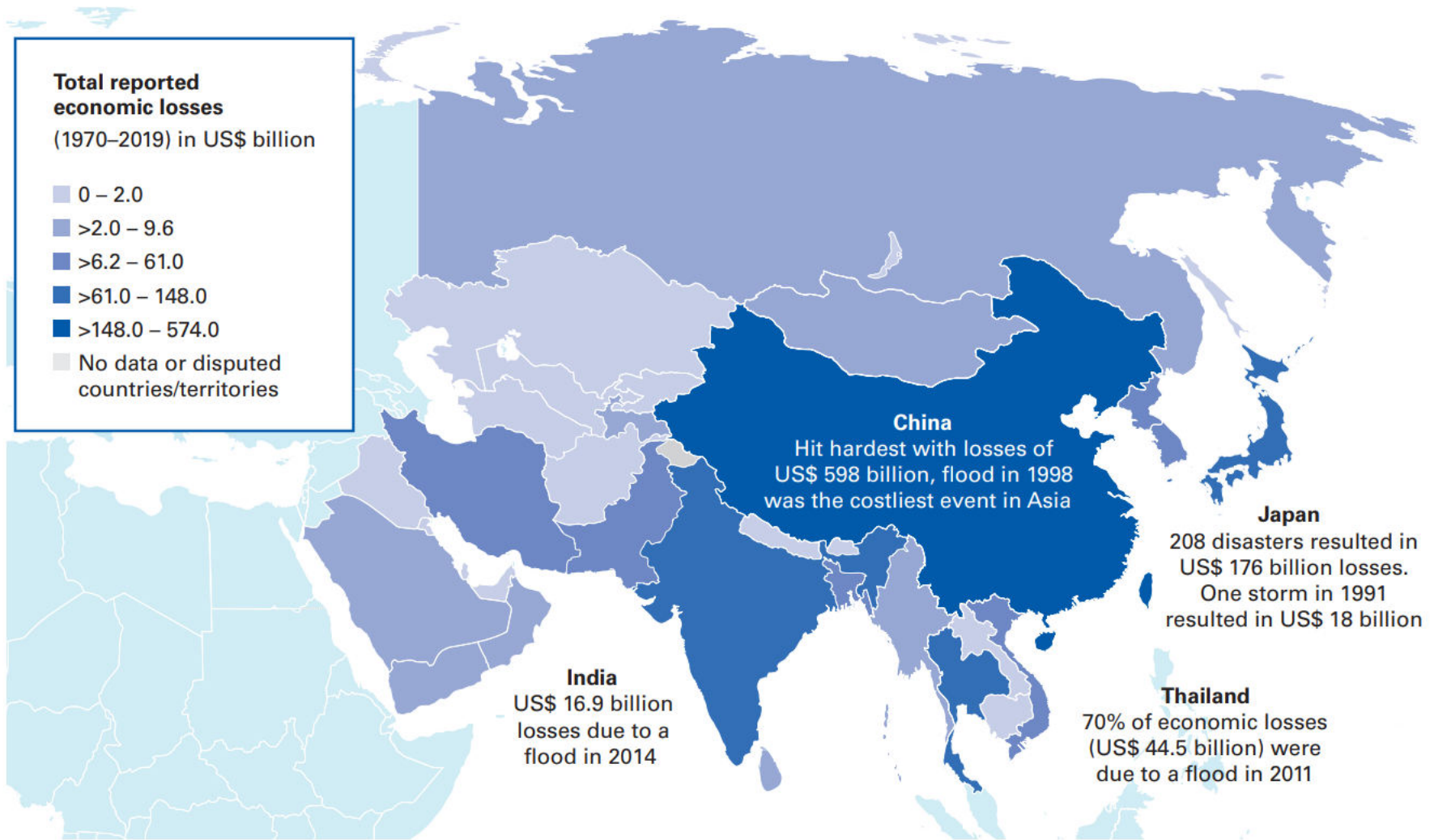
Source: Herrera-García et al., Mapping the global threat of land subsidence. 2020, *Science*, Vol. 371, Issue 6524, pp. 34-36.
DOI: [10.1126/science.abb8549](https://doi.org/10.1126/science.abb8549). In: Utrecht University, News. <https://bit.ly/3GtDGHv>



Export of agricultural products in 2015 by value (USD)

Map by Applied Works. In: Benton T: *Food security, trade and its impacts*. 2017.

Available at, <https://resourcetrade.earth/publications/food-security-trade-and-its-impacts>



Reported disasters and related economic losses in Asia (1970–2019)

WMO (2021) WMO Atlas of mortality and economic losses from weather, climate and water extremes (1970–2019)

2 lakh

estimated number of people die every year due to inadequate water, sanitation and hygiene⁽²⁾.

820 million

people in 12 major river basins of India are facing high to extreme water stress situation⁽²⁾.

70%

of India's surface water is contaminated⁽²⁾.

50 BCM

estimated demand-supply gap for the domestic sector in 2030⁽²⁾. (BCM - Billion cubic meters)

82%

of rural households in India do not have individual piped water supply⁽²⁾.

163 million

live without access to clean water close to their homes⁽²⁾.

India

Non-Revenue Water (NRW)



New Delhi - Delhi Jal Board (DJB) with the support of Japan International Cooperation Agency (JICA) implemented Pilot Project in a District Metering Area in Pitampura (residential area in Northwest Delhi) to improve water facilities.

Field Sensors, Remote Terminal Unit (RTU), SCADA and Hitachi Pipe Network Management System (PNMS) were commissioned for real time monitoring of the hydraulic health of water distribution network in Pitampura Area. Further, the Delhi Jal Board (DJB) collaborated with Hitachi India Private Limited - Infrastructure Systems Division for the Operation & Maintenance of SCADA and PNMS system in Pitampura area.

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