

AQUATIC SCIENCES (Online Resource)

A global boom in hydropower dam construction

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Supplementary material: Figures S1 – S10

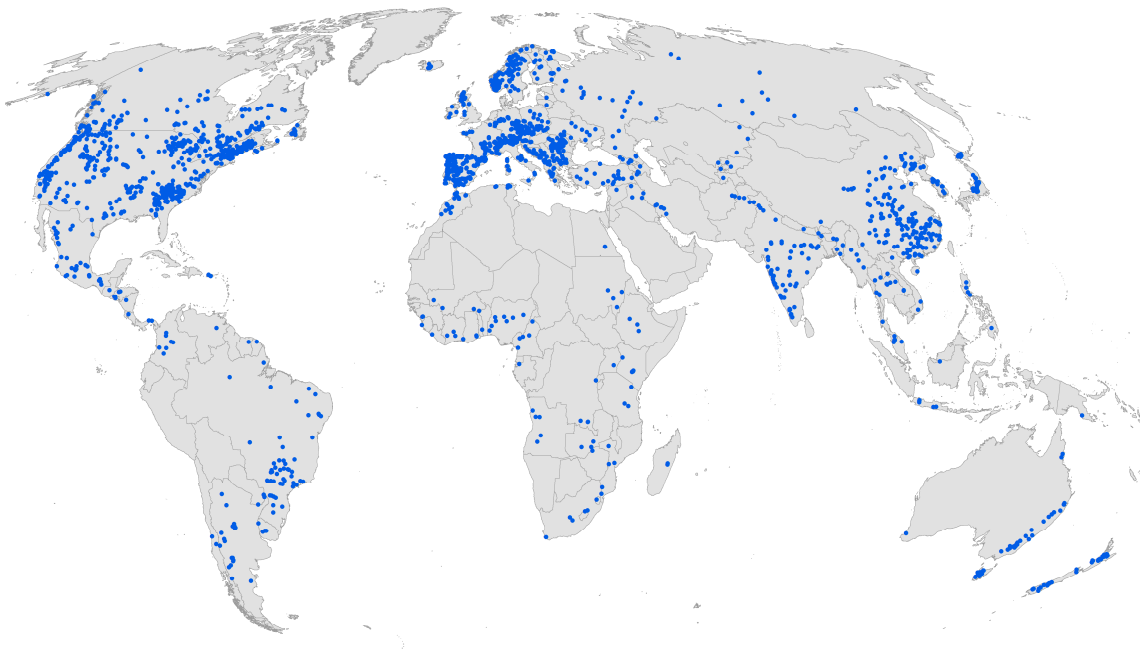


Fig. S1 Spatial distribution of existing hydropower dams worldwide according to the Grand database (Lehner et al. 2011)

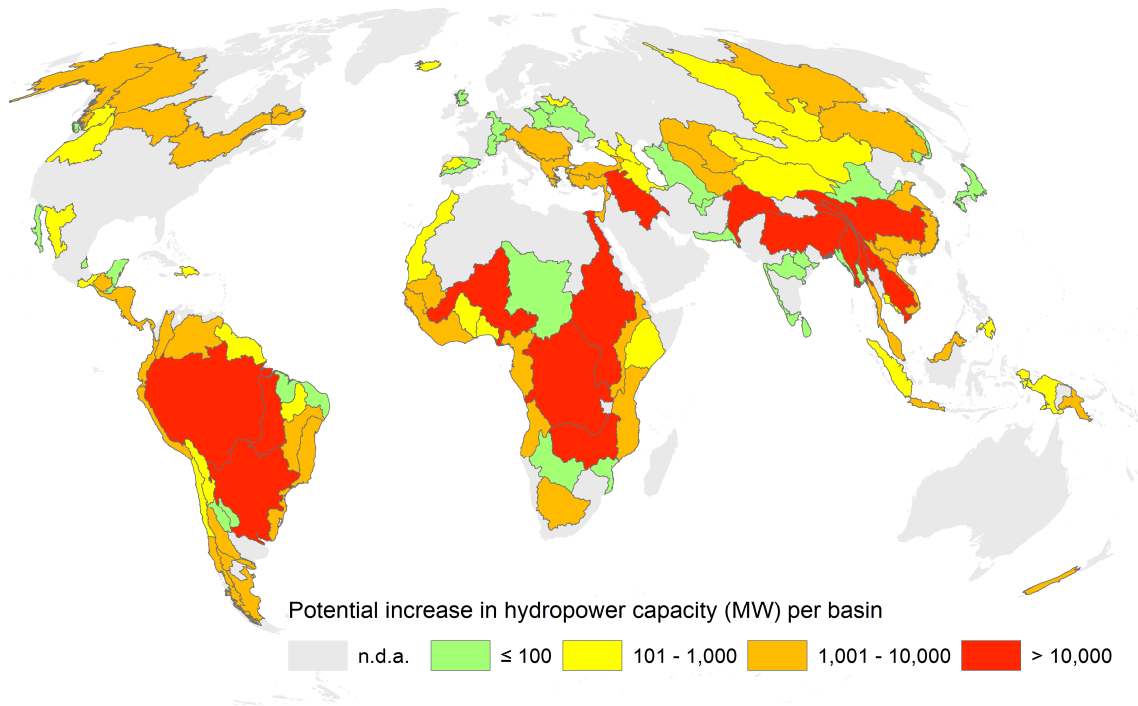


Fig. S2 Potential increase in hydropower capacity (MW) with construction of future dams. Red: $> 10,000$; Orange: $> 1,000 - 10,000$; Yellow: $> 100 - 1,000$; Green: ≤ 100 ; Gray: no data available

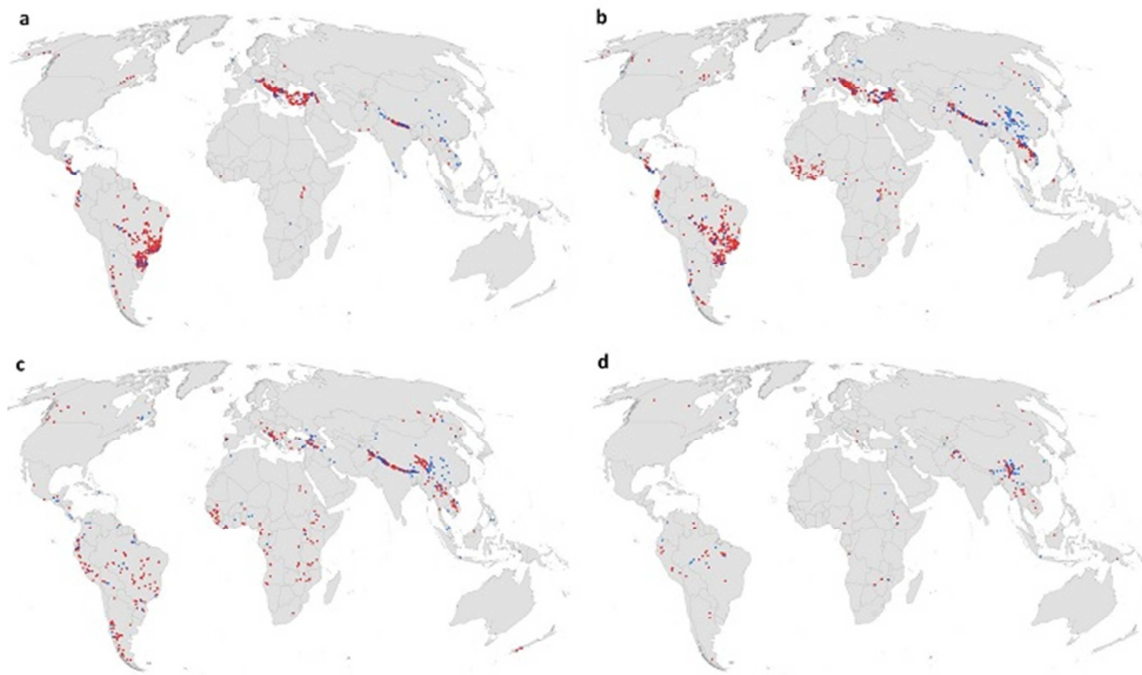


Fig. S3 Spatial distribution of future hydropower dams classified according to their capacity. Capacity data are available for 3,490 dams out of the database with 3,700 dams. Percentages given in the following in brackets are related to the total numbers/capacities: **a:** 1 – 10 MW; comprises 1,290 dams (35%) with 6.0 GW (0.8%). **b:** >10 – 100 MW; comprises 1,388 dams (38%) with 51.6 GW (7.3%). **c:** >100 – 1,000 MW; comprises 659 dams (18%) with 221.8 GW (31%). **d:** >1,000 MW; comprises 153 dams (4.1%) with 432 GW (61%)

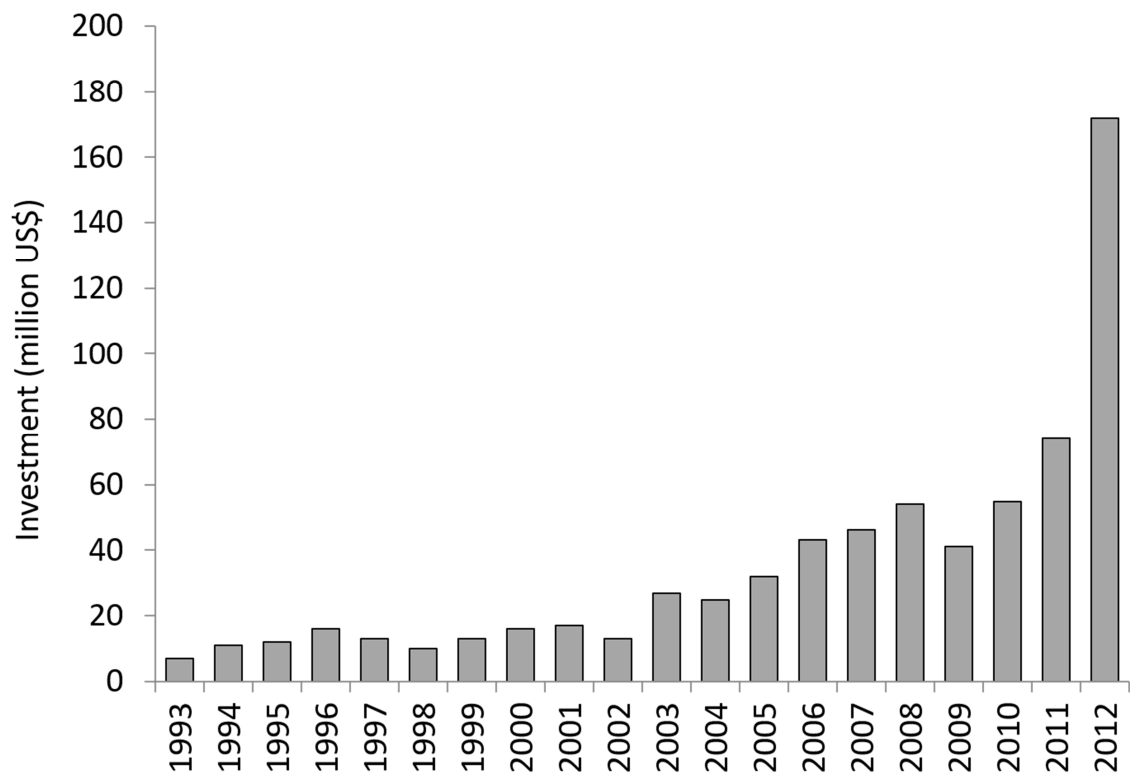


Fig. S4 Global investments into the hydroelectricity sector. Data represented do not comprise a complete overview due to constraints in availability (see *Methods and Materials* for further details)

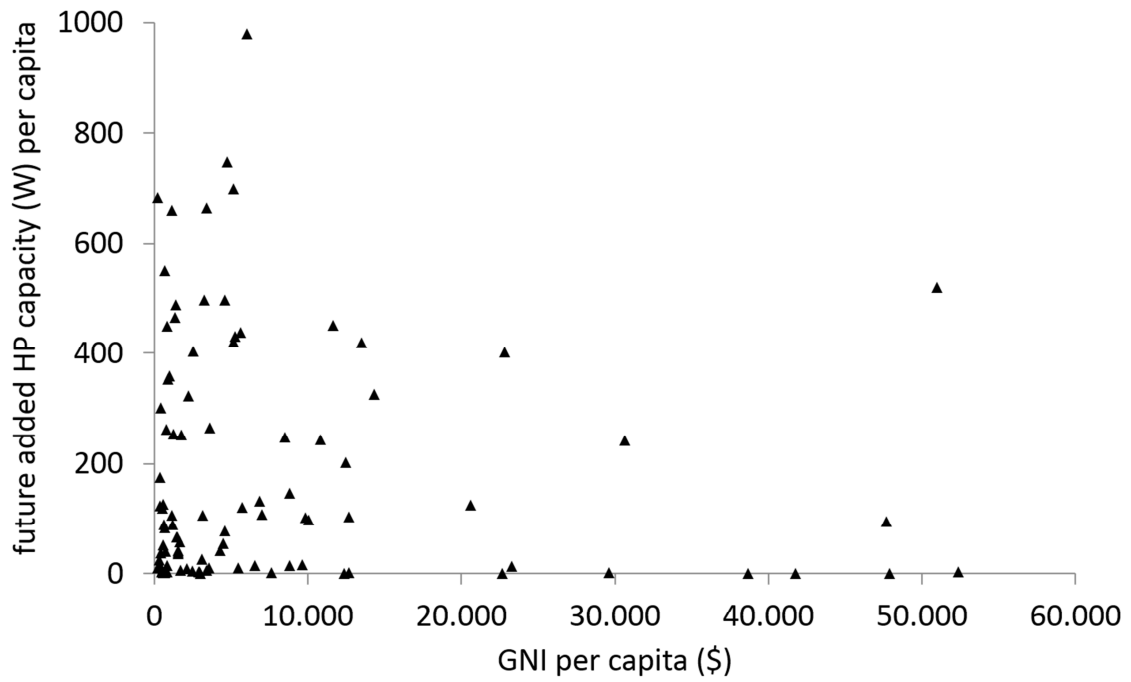


Fig. S5 (In-)Dependence of future added hydropower capacity (W) per capita in 102 countries on their respective GNI per capita (2012; The World Bank 2014e)

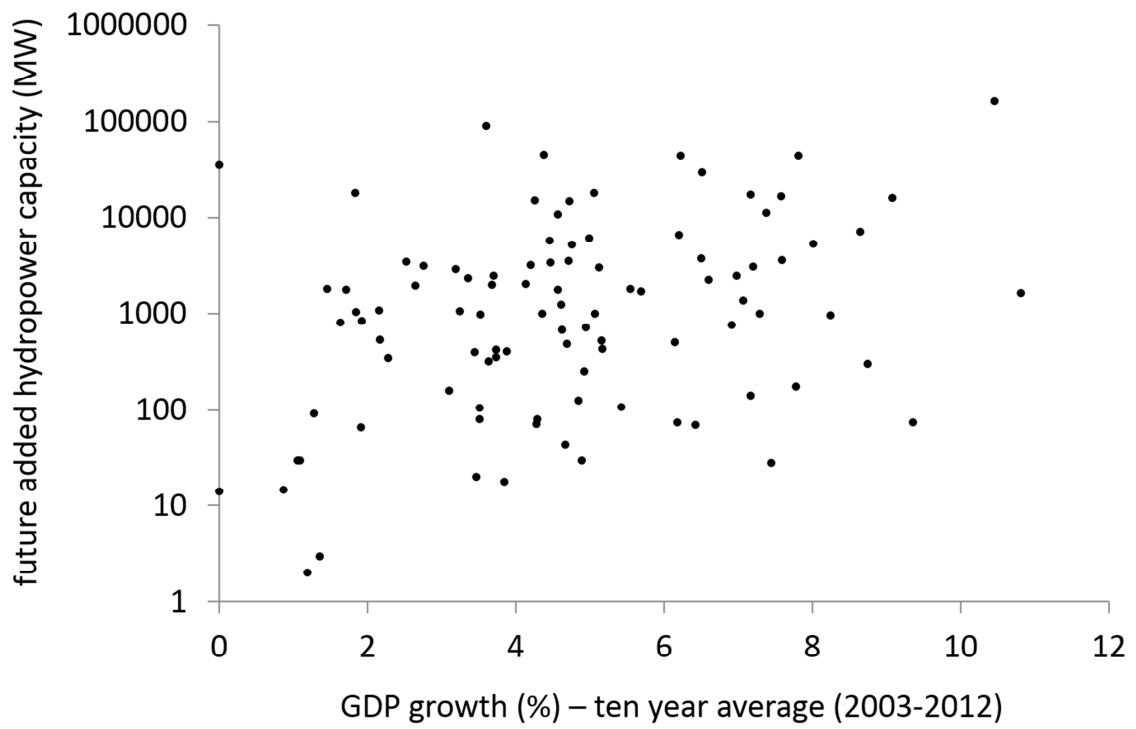


Fig. S6 Added hydropower capacity by future dams per country in dependence on the economic growth of the country (averaged GDP growth (%) 2003-2012)

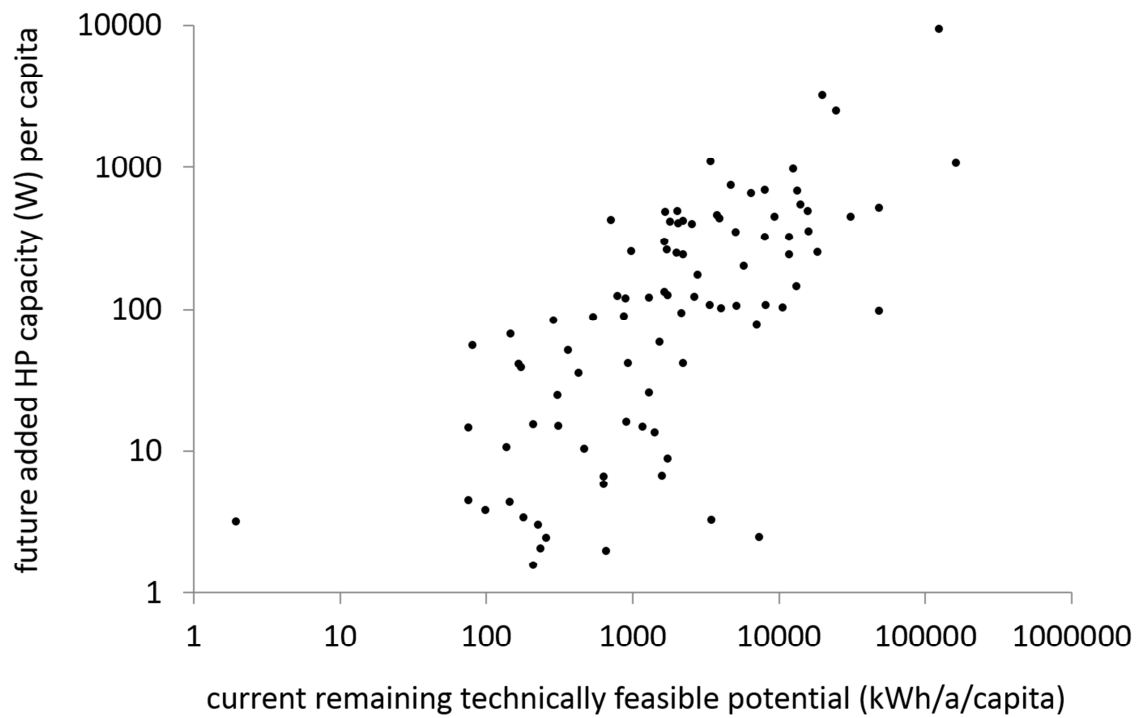


Fig. S7 Dependence of future added hydropower capacity (W) per capita on the currently exploited technically feasible hydropower potential (kWh year⁻¹ per capita). Details on the exploitation of the technically feasible hydropower potential per country can be shown in Fig. S8

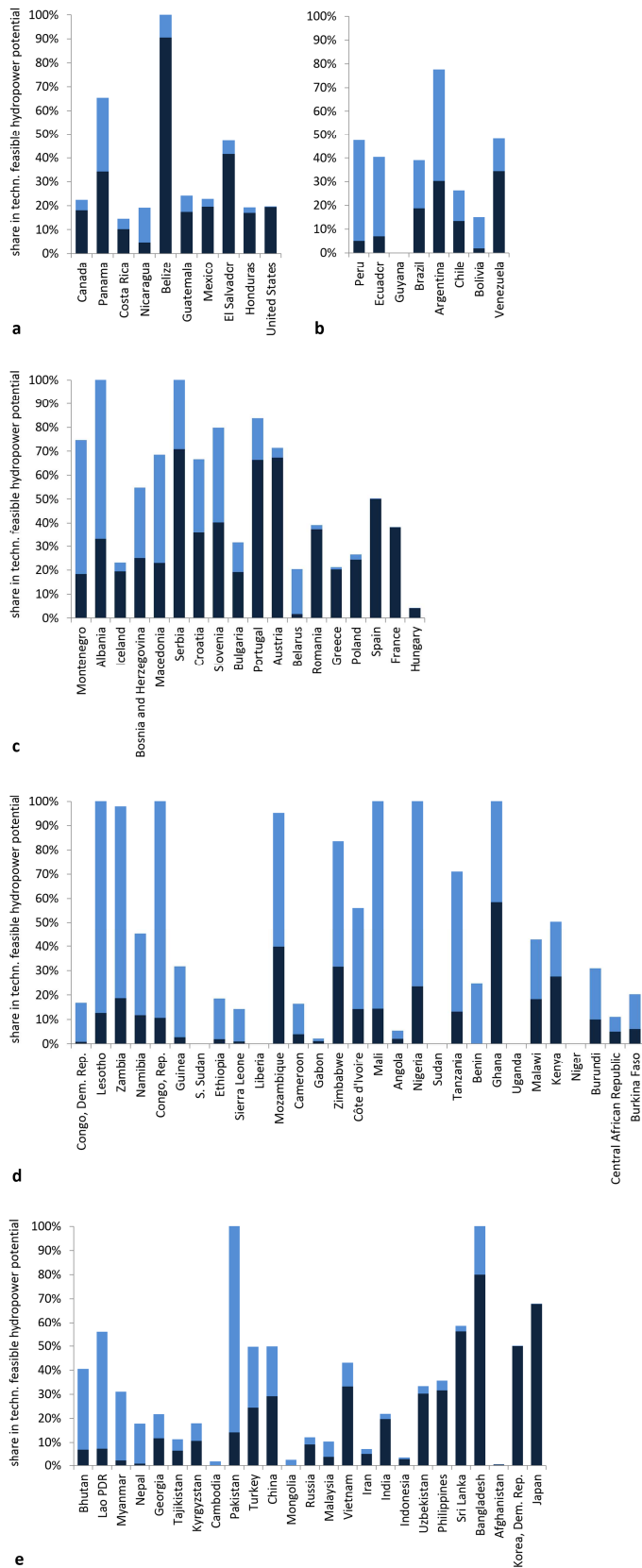


Fig. S8 Current (2011, dark blue) and future (light blue) exploitation of the technically feasible hydropower potential in countries of a: North and Central America; b: South America; c: Europe; d: Africa; e: Asia. Countries are sorted according to decreasing total technically feasible hydropower potential (MW). The representation of the sum of current and future share exceeds in some cases 100% which is due to the required conversion for future dams from MW to GWh year⁻¹ assuming current efficiencies as described in the *Methods and Materials* section. Another reason might also be that not all of the planned (but here considered) dams will eventually be constructed

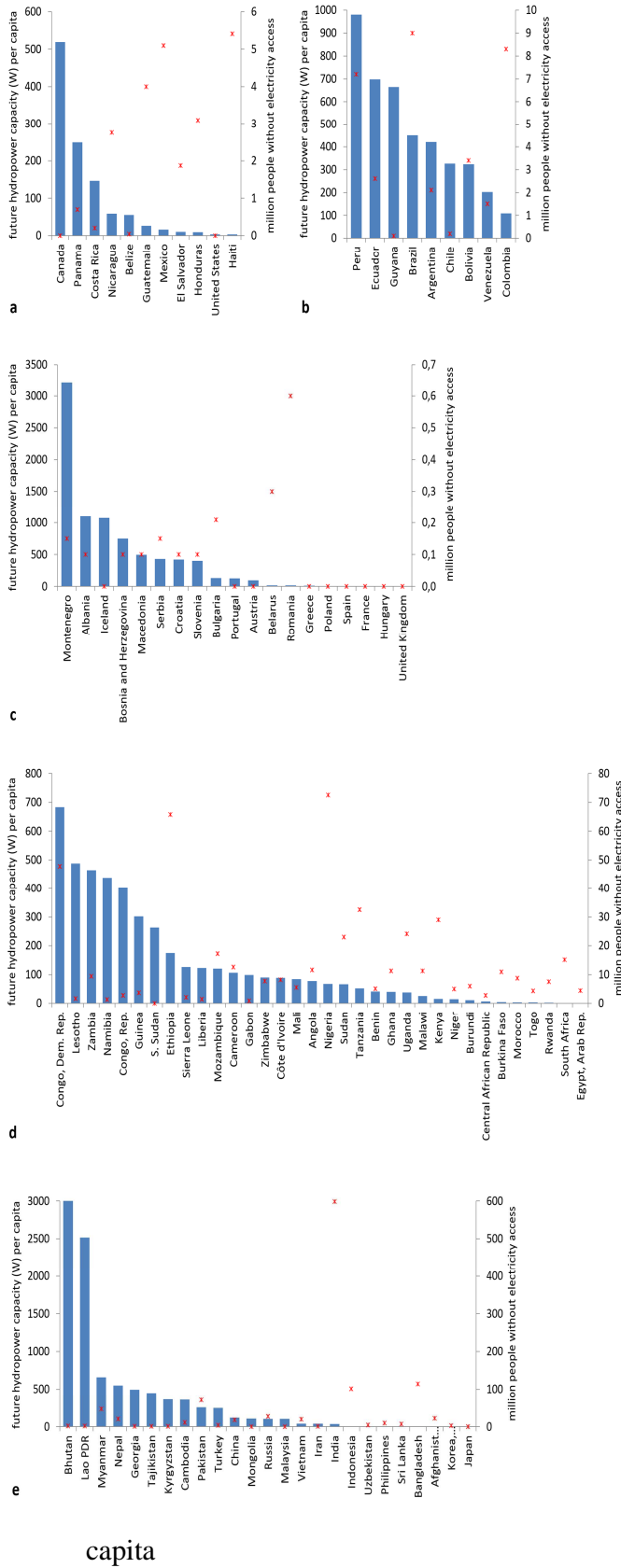


Fig. S9 Future added hydropower capacity (W; blue columns) per capita and number of people (million) without access to electricity (2000; red crosses) in countries of a: North and Central America; b: South America; c: Europe; d: Africa; e: Asia. The representation of the future capacity in Bhutan exceeds the scale of the y-axis and amounts to 9,544 W per capita

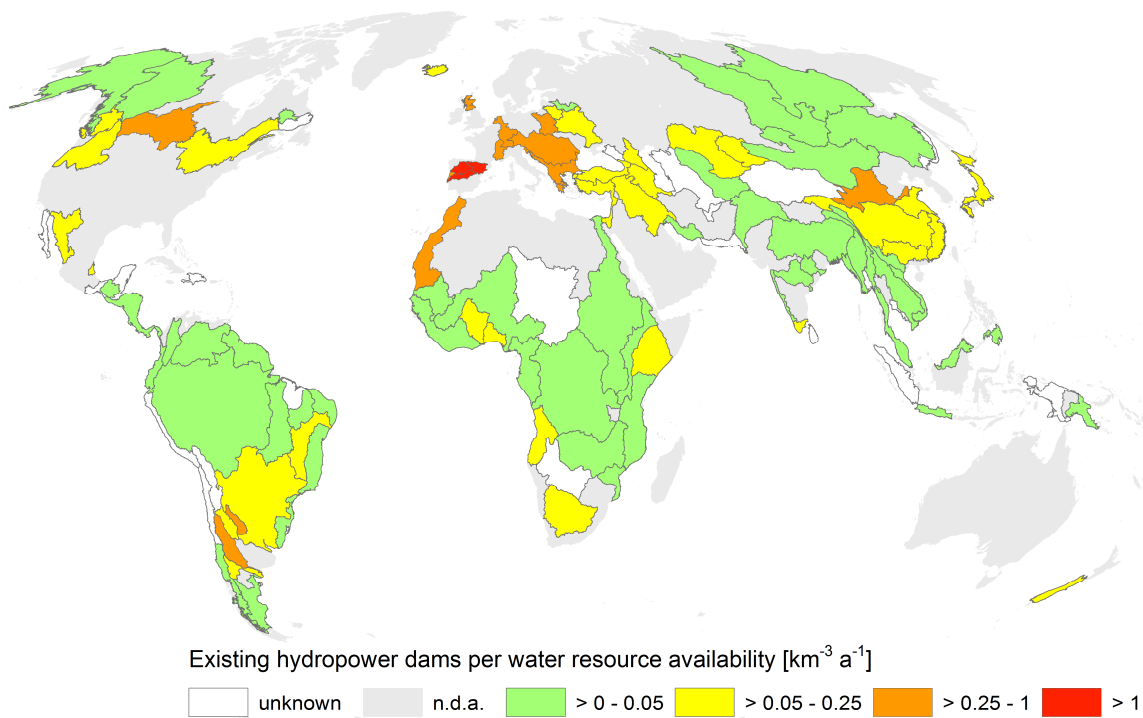


Fig. S10 Number of existing hydropower dams (Lehner et al. 2011) in relation to major river basin discharge (dams per $\text{km}^3 \text{year}^{-1}$). *Red:* > 1; *Orange:* > 0.25 – 1; *Yellow:* > 0.05 – 0.25; *Green:* > 0 – 0.05; *Gray:* no data available; *White:* unknown