Global Energy Policy Research | GEPR

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?? ?? · Monday, April 25th, 2022

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NicoElNino/iStock

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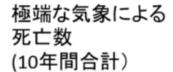
There is *high confidence* that climate change and projected socio-economic development would increase exposure in inundation areas (Figure 4.17), resulting in a large increase in direct flood damages as several times more in all warming levels (Table 4.6). (Alfieri et al., 2017) estimated a 120% and 400% increase in population affected by river flooding for 2°C and 4 °C warming, respectively, and a 170% increase in damage for 2°C warming without socio-economic impact development (4.7.5). (Dottori et al., 2018) estimated the same but with a 134% increase in fatalities with population increase under the SSP3 scenario. The highest numbers of people affected by river flooding are projected for countries in southern, eastern and south-eastern Asia, with tens of millions of people per year per country projected to be affected (Figure 4.17; (Alfieri et al., 2017; Hirabayashi et al., 2021b). (Kinoshita et al., 2018) showed that climate change

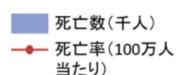
This research aims to explore changes in flood risk at different warming levels, independently from when those occur. Hence, we did not include the effect of socioeconomic changes such as projections of population, GDP, or land use. Impact estimates refer to population estimates of 2015 and damage in EUR at Purchasing Power Parity in 2010 values.

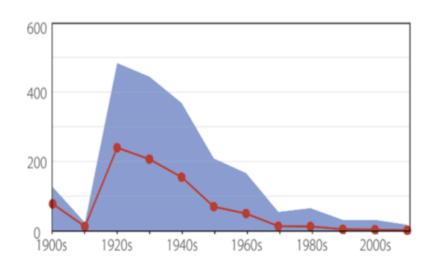
(1.5 °C, 2 °C and 3 °C warming) is very similar with CMIP5 and CMIP6 (Fig. 3). To focus on flood change only, the population distribution was fixed at that of 2015; the result shows that annual global flood exposure increases about 1.4-fold (from 2.2 to 3.2% of the global population) from historical period (1971–2000) with 3 °C warming in CMIP6.

risk^{12,13}. We combine climate projections based on Representative Concentration Pathways (RCP)8.5 with the Shared Socio-economic Pathway (SSP) data on population, GDP and urbanization corresponding to SSP3 and SSP5²³. For all analyses, we assume present-day flood protection and vulnerability conditions in order to avoid hypotheses on the evolution therein up to the end of the century. As such, calculated impacts represent a reference

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