



## Climate change risks to push large parts of global food production and population centres to unprecedented conditions

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The majority of global food production, as we know it, is based on agricultural practices developed within stable Holocene climate conditions. Climate change is altering the key conditions for human societies, such as precipitation, temperature and aridity. Their combined impact on altering the conditions in areas where people live and grow food has not yet, however, been systematically quantified on a global scale. Here, we estimate the impacts of two climate change scenarios (RCP 2.6, RCP 8.5) on major population centres and food crop production areas at 5 arc-min scale (~10 km at equator) using Holdridge Life Zones (HLZs), a concept that incorporates all the aforementioned climatic characteristics. We found that if rapid growth of GHG emissions is not halted (RCP 8.5), in year 2070, one fifth of the major food production areas and one fourth of the global population centres would experience climate conditions beyond the ones where food is currently produced, and people are living. Our results thus reinforce the importance of following the RCP 2.6 path, as then only a small fraction of food production (5%) and population centres (6%) would face such unprecedented conditions. Several areas experiencing these unprecedented conditions also have low resilience, such as those within Burkina Faso, Cambodia, Chad, and Guinea-Bissau. In these countries over 75% of food production and population would experience unprecedented climatic conditions under RCP 8.5. These and many other hotspot areas require the most urgent attention to secure sustainable development and equity.