Impact of unseasonable flooding on women's food security and mental health in rural Sylhet, Bangladesh: a longitudinal observational study

Sophie Gepp, Jillian L Waid, Dagmar Brombierstäudl, Abdul Kader, Anna A Müller-Hauser, Amanda S Wendt, Juliane Dame, Sabine Gabrysch

Published Online October 31, 2022

Charité – Universitätsmedizin Berlin, Berlin, Germany (S Gepp MSc, A A Müller-Hauser PhD, Prof S Gabrysch); **Potsdam Institute for Climate Impact Research, Potsdam, Germany** (S Gepp, J L Waid MSW, A A Müller-Hauser, A S Wendt PhD, Prof S Gabrysch); **Department of Geography** (D Brombierstäudl MSc, J Dame PhD), **and Heidelberg Institute of Global Health** (A A Müller-Hauser, Prof S Gabrysch), **Heidelberg University, Heidelberg, Germany; Helen Keller International, Dhaka, Bangladesh** (A Kader MPH); **Department of Geography, University of Bonn, Bonn, Germany** (J Dame)

Correspondence to Ms Sophie Gepp, Charité – Universitätsmedizin Berlin, Berlin 10117, Germany
sophie.gepp@charite.de

Abstract

Background Climate change will lead to more frequent and intensive flooding. In April, 2017, unseasonably early flooding led to the inundation of low-lying cropland before the rice harvest in northeastern Bangladesh. We describe coping strategies and quantify short-term and medium-term effects of flooding events on food security and depressive symptoms of women.

Methods This observational study is part of the cluster-randomised Food and Agricultural Approaches to Reducing Malnutrition trial (FAARM; NCT02505711). Women self-reported flooding exposure on behalf of their households when surveyed (approximately 6 months after the event). Remote sensing analysis was used to detect the extent of the flooding. We collected data on household food security at baseline, depressive symptoms 4–5 months before the flooding, and coping strategies immediately after the event. We followed up on these outcome measurements for depressive symptoms and food security for up to 2·5 years after the flooding event. We used multilevel regression adjusting for intervention allocation and pre-flooding measures to quantify the flood's effect on household food security and women's mental health.

Findings The FAARM trial included 2700 young women in 96 settlements in rural Sylhet, Bangladesh. 1335 (56%) of 2405 women reported that their household being greatly affected, with many losing a large part of their rice harvest. Borrowing money with interest was the most common coping strategy, with households paying back on average 1·5 times the borrowed amount. Greatly affected households had higher odds of food insecurity, with a decreasing effect with increasing time after the flood (odds ratio: 2·4 [p<0·0001] 0·5 years after; 1·6 [p<0·0001] 2·0 years after]; and 1·3 [p=0·012] 2·5 years after). Women in such households also had 1·45 times higher odds of depression (p=0·0001) 2·5 years after the flooding event.

Interpretation The 2017 flooding event negatively affected food security and the mental health of women in rural Sylhet, Bangladesh, and few affected women received formal government support. To reduce the impact of future floods, livelihood adaptations and expansion of financial protection programmes are essential measures to pursue.

Funding German Federal Ministry for Education and Research (Berlin, Germany) and UK Department for International Development (London, UK).

Contributors
SGa conceived the study. AAM-H drafted the flood questionnaire with input from JLW, ASW, and SGa. SGa, ASW, and JLW designed the FAARM questionnaires. AK supervised data collection in the field. JLW processed the data. SGa, JLW, and SGe analysed the data. DB and JD analysed remote sensing data. JLW, SGa, and SGe accessed and verified all underlying data. All authors contributed to data interpretation and writing.

Declaration of interests
We declare no competing interests.