The potential of crowdsourcing and mobile technology to support flood disaster risk reduction

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The last decade has seen a rise in citizen science and crowdsourcing for carrying out a variety of tasks across a number of different fields, most notably the collection of data such as the identification of species (e.g. eBird and iNaturalist) and the classification of images (e.g. Galaxy Zoo and Geo-Wiki). Combining human computing with the proliferation of mobile technology has resulted in vast amounts of geo-located data that have considerable value across multiple domains including flood disaster risk reduction. Crowdsourcing technologies, in the form of online mapping, are now being utilized to great effect in post-disaster mapping and relief efforts, e.g. the activities of Humanitarian OpenStreetMap, complementing official channels of relief (e.g. Haiti, Nepal and New York). Disaster event monitoring efforts have been further complemented with the use of social media (e.g. twitter for earthquakes, flood monitoring, and fire detection). Much of the activity in this area has focused on ex-post emergency management while there is considerable potential for utilizing crowdsourcing and mobile technology for vulnerability assessment, early warning and to bolster resilience to flood events. This paper examines the use of crowdsourcing and mobile technology for measuring and monitoring flood hazards, exposure to floods, and vulnerability, drawing upon examples from the literature and ongoing projects on flooding and food security at IIASA.