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Preparing for urban floods in Mozambique: Can risk communication help?

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- Information dissemination can be a powerful tool to guide, educate, and capacitate citizens in preparation for natural disasters. This study conducted in Mozambique seeks to provide actionable insights about the role of risk communication in urban flood risk management.
- Through video interventions and in-person surveys with residents in Quelimane in the months preceding the 2021-2022 wet season, the researcher sought to understand the challenges associated with risk communication.
- After watching a video which featured local government officials, respondents were more aware about the flood risks they faced. They also report a higher likelihood for implementing preparedness actions. These results suggest that it was not necessary to raise concerns or fear about flooding to increase the intention to prepare.
- The second video which featured Quelimane residents with flooding experience raised the perception that others would approve of taking preventive measures, thus influencing social norms regarding flood preparation.
- The brief includes policy recommendations on how governments can better communicate with households on disaster risk prevention.

POLICY BRIEF MOZ-21026

FEBRUARY 2022

This project was funded
by IGC Mozambique

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FUNDED BY



Research problem

Climate change has increased the frequency and intensity of extreme weather events such as heatwaves, heavy precipitation, droughts, and tropical cyclones (IPCC, 2021). In particular, small and medium-sized low-income cities are vulnerable to extreme climate events. The management of risks related to climate and natural disasters requires local involvement and understanding. For facilitating this, information dissemination can be a powerful tool to guide, educate, and capacitate households in preparation for natural disasters. However, risk information and accurate forecasts do not always bring about the desired preparedness action from communities at risk. Common reasons for the failure of risk communication include design and delivery flaws, lack of trust in authorities, and misunderstood risk perceptions (Ayeb-Karlsson et al., 2019). A post-disaster report by Norton et al. (2020) on the 2019 Cyclones Idai and Kenneth in Mozambique concluded that even with accurate forecasts and warnings, many failed to fully comprehend the storms' potential intensity and impacts. Moreover, there was a lack of knowledge on how to take concrete actions.

Overview of the research

The primary objective of this study was to provide actionable insights about the role of risk communication in urban flood risk management. To reach this goal, I use a randomised field experiment to evaluate a disaster awareness campaign addressing the challenges associated with risk communication. The setting of this experiment is the Mozambican coastal city, Quelimane. This city is experiencing rapid urbanisation and is vulnerable to a variety of climate threats. During the wet season from December to April, Quelimane experiences floods from excessive rainfall and extreme winds.

For this experiment, I conducted in-person surveys with randomly sampled residents in the months preceding the 2021-2022 wet season. As part of the surveys, I showed videos about flood risk and how to prepare. The effect of the videos on risk perceptions and the intention to prepare is measured against a control group which watched a placebo video.

The content of the intervention videos was motivated by the idea that risk information is particularly effective if bundled with practical information on protecting against floods (Haer et al., 2016). I designed the videos to be easily understandable, by using non-technical language and visuals of flooding events and mitigating actions. Also, I guaranteed their inclusiveness by inviting both male and female speakers. Moreover, the videos were available in both the national language (Portuguese) and the local language (Chuabo). This mattered; 31% of the sample opted to watch the video in the local language. The two interventions covered the same information, but differed in the people speaking and featured in the videos.

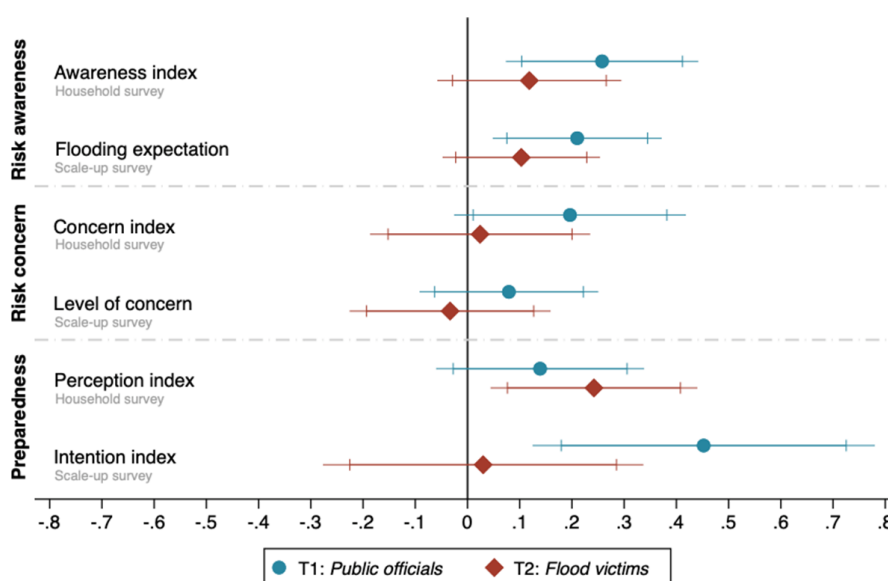
1. Public officials: One could expect that the expertise and experience of local government officials would increase the credibility and acceptance of the message. However, a potential lack of trust in institutions posed a threat. This intervention is relevant from a policy perspective because any large-scale information campaign will be associated with the official authorities.

2. Flood victims: Featuring Quelimane residents with recent flooding experience may be more persuasive because of proximity to the viewer (Bernard et al., 2015). The personal dimension of the message may make it more salient and trigger peer learning.

Overview of the main results

Figure 1 summarises the paper's main results. After watching the *public officials* video, the respondents were more aware about the flood risks they faced. They also report a higher likelihood for implementing preparedness actions than respondents exposed to the *flood victims* and placebo videos. Taken together, these results suggest that it was not necessary to raise concerns or fear about flooding to increase the intention to prepare. The flood victims video did raise the perception that others would approve of taking preventive measures. Thus, influencing social norms regarding flood preparation.

Figure 1: Treatment effects on risk perceptions and preparedness intentions

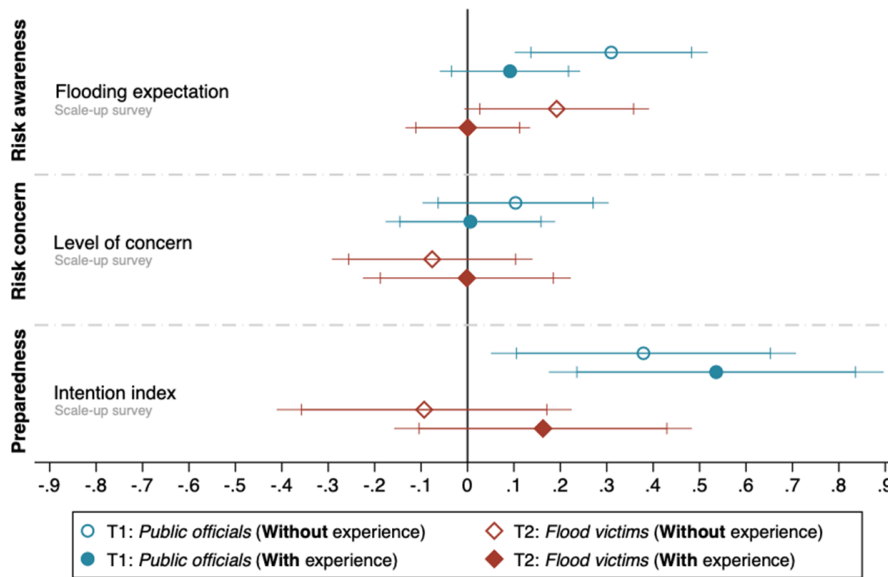


Note. Coefficient points in standard deviations. Lines indicate the 95 percent confidence intervals, with a cap at 90 percent. The household and scale-up survey samples are two different samples and contain 642 and 3,536 observations, respectively. See the paper for more details on samples and construction of indices.

There is an emerging literature showing that past experiences raise risk awareness, risk aversion and preparedness action. See for example studies about [floods in Europe](#), [cyclones in the Fiji Islands](#), and [violence in Afghanistan](#). In line with these studies, households with recent flooding experience in Quelimane were already more aware and therefore their perceptions were not affected by the interventions. Figure 2 provides an illustration. In contrast, flood experience did not matter for the effect on the intention to prepare.

This result highlights the importance of including examples of actionable mitigation measures in risk awareness campaigns because even experienced households might not yet be familiar with these measures.

Figure 2: Treatment effects depending on recent flood experience



Note. Coefficient points in standard deviations. Lines indicate the 95 percent confidence intervals, with a cap at 90 percent. The scale-up survey sample contains 3,536 observations. See the paper for more details on samples and construction of indices.

A recent World Bank report by Erman et al. (2021) shows that women and other vulnerable groups are more susceptible to disasters due to pre-existing inequalities and gender gaps. It is therefore crucial to systematically collect and evaluate gender-disaggregated data to promote and inform gender-responsive disaster risk management policies and interventions. In the paper, I show that the *public officials* intervention did not change the perceptions and intentions of men more than women. Moreover, scaling up the intervention through door-to-door visits or television would not penalise women in the studied context. Indeed, women were twice as likely to be home during the day and access to a television is balanced (around 73%).

Policy recommendations

Providing contextualised and easy to understand risk information to urban households before the wet season may present large benefits.

The first step towards improving resilience is increasing awareness. The results suggest that risk awareness can be improved even in a city where climate risk is extremely prevalent.

Risk awareness campaigns should include examples of actionable mitigation measures. Households with recent flooding experience are more aware about risk but are not necessarily familiar with effective mitigation measures. Moreover, the results suggest that raising concern was not a prerequisite for increasing the intention to prepare.

Personal experiences from flood victims in risk communication can help shifting social norms regarding flood preparation. The video featuring flood victims also raised awareness among households without recent flooding experience.

Carefully designed and implemented awareness campaigns can be gender responsive. The results provide evidence for the inclusiveness of the video content and possible methods of dissemination.