Introducing Forecast-based Financing to an Urban Setting

German Red Cross

German Red Cross staff speak with a bicycle guide as part of a survey of outdoor workers conducted in July 2018 in Hanoi, Vietnam.

BRINGING FBF TO URBAN CONTEXTS

Red Cross and Red Crescent Societies have initiated pilot Forecast-based Financing (FbF) projects in numerous countries across Asia, Africa, and Central America. Thus far, all pilot projects have taken place in rural settings.

To better understand how FbF could be applied to an urban setting, the Vietnam Red Cross (VNRC) and German Red Cross (GRC) launched "FbF Ready" in Hanoi, Vietnam, in January 2018.

The goal of the "FbF Ready" project is to identify early actions that can reduce the health impacts of heat waves, with a special focus on vulnerable groups such as the elderly, people with disabilities, people with chronic diseases and street workers. The project will also equip the VNRC to replicate the FbF approach to respond preemptively to other disasters.

WHY VIETNAM? WHY HANOI?

Vietnam is considered one of the most hazard-prone areas in the Asia Pacific Region,[1] susceptible to extreme weather events including typhoons, floods, droughts, heat waves, landslides, and forest fires. The country is among the five nations potentially most affected by climate change in the world.[2] Climate change is likely to increase the frequency and intensity of the hydro-meteorological disasters that Vietnam faces.[3] Among these disasters are heat waves, which pose a significant public health hazard to urban populations, particularly for vulnerable populations such as the elderly.[4]

Average temperatures have risen in Hanoi in recent years, likely the result of climate change and urbanization.[5] Heat waves can be greatly magnified in densely populated cities, where the combination of human activity, large buildings obstructing the flow of air, and burning of fossil

fuels combine to create “urban heat islands,” or areas of intensified heat within a city. To target the areas of a city most impacted by a heat wave, specific forecasts must be obtained and maps created of neighborhoods with poor capacity to cope with the effects of intense heat.

Street workers, the elderly, and individuals in care centers and hospitals are among the populations most vulnerable to heat waves. The vulnerability of an urban population can be worsened by inadequate housing constructed with heat-retaining materials or lacking in cooling appliances such as fans. Lack of information on forecasts and knowledge of coping strategies may also contribute to increased vulnerability.

WHAT MAKES URBAN FBF UNIQUE?

An organization designing an FbF mechanism in an urban environment must work on a much smaller geographical scale than those working in rural settings. As population density is much greater in urban contexts, households with a wide range of vulnerability, exposure and risk profiles live within close proximity of one another. The same is true of the neighborhoods that make up a modern city such as Hanoi. Within just a few meters, one can find aging slums with poor air circulation and newly constructed office buildings and condominiums equipped with central air conditioning.

Such great diversity in landscape and population demands that FbF practitioners obtain **high resolution local forecasts** with which to predict the occurrence of an extreme weather event with sufficient lead time and a high degree of confidence. In partnership with the Vietnam Institute of Meteorology, Hydrology and Climate Change (IMHEN), the “FbF Ready” project is currently assessing the capacities of and gaps in local forecasts.

As heat waves can impact a large area at one time, forecasts must be supplemented by maps to identify areas most likely to experience “urban heat islands” and to host the largest population of people most vulnerable to an extreme heat event. In addition to the high resolution local forecasts identified with IMHEN, the project also carried out a **QGIS mapping exercise** to identify

A volunteer for the German Red Cross interviews a Grab bike driver in Hanoi’s Hoàng Mai District on November 1, 2018 as part of the “FbF Ready” project’s Knowledge, Attitudes, and Practices Survey.

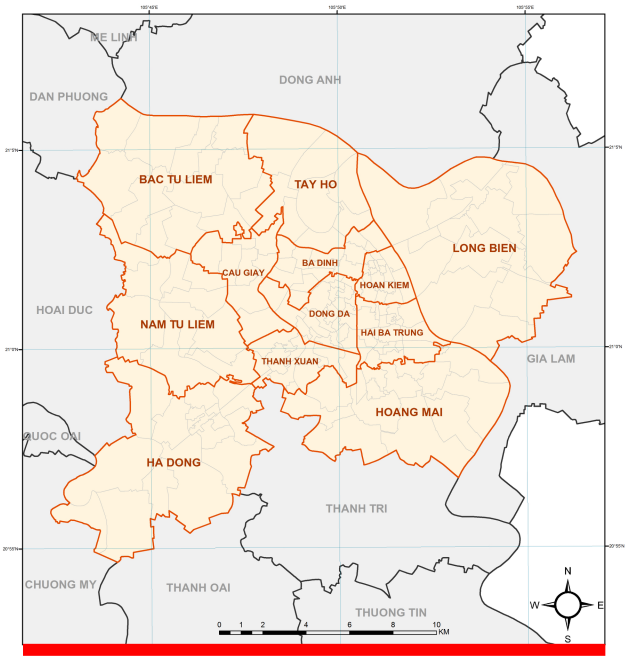
areas at high risk of negative heat-related public health outcomes, and thus appropriate settings for early actions in the event of a heat wave.

To produce the maps, three layers of data are used to identify areas for implementation of Early Actions: The **vulnerability** of the affected population (e.g. age, disability, income), the population's **exposure** to the heatwave (e.g. access to cooling appliances), and the forecast of the **hazard** on different areas (e.g. heat islands). By combining these three layers of information, an impact forecast map can be produced.

Finally, urban FbF practitioners must take a robust research-based approach to understanding their operational environment during the initial "risk assessment" stage of the project.

Toward this end, the "FbF Ready" project is conducting an extensive **Knowledge, Attitudes, and Practices (KAP) Survey** throughout Hanoi to collect quantitative and qualitative data about the current capacities of vulnerable groups to cope with heat waves as well as their level of awareness about their occurrence and impact.

As urban centers such as Hanoi are host to a great number of governmental and non-governmental organizations involved in climatic and disaster risk reduction-related programming, there is a need

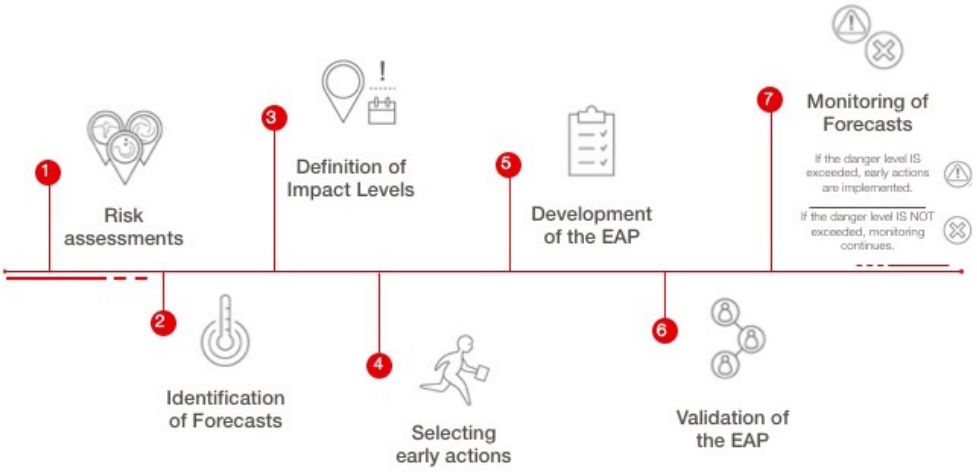


Hanoi is divided into 12 urban districts.

and opportunity to create alliances and engage with a broad range of stakeholders.

The "FbF Ready" project conducted a **Stakeholder Network Analysis** and **AGIRI Stakeholder Analysis** to identify relevant stakeholders in Hanoi and potential opportunities for collaboration and meaningful engagement with them.

Right: The "FbF Ready" project's progress as of November 2018. Before identifying forecasts and defining the impact levels at which early actions should be triggered, extensive surveys and assessments must be conductedto understand the impact of heatwaves on Hanoi's most vulnerable populations.



(1-2) "Vietnam" in "*Disaster Risk Management Programs for Priority Countries*," *World Bank*, 2011. Pages 106-120.
(3) Susmita Dasgupta, Benoit Laplante, Craig Meisner, David Wheeler, and Jianping Yan. "The Impact of Sea Level Rise on Developing Countries: A Comparative Analysis," *World Bank*, 2007.
(4) Xiaofang Ye, Rodney Wolff, Weiwei Yu, Pavla Vaneckova, Xiaochuan Pan, and Shilu Tong. "Ambient Temperature and Morbidity: A Review of Epidemiological Evidence," *Environmental Health Perspectives*, 2012. Page 19.
(5) Thi Thanh Hiên Pham, Thi Huyen Ai Tong, Van Cu Pham. "Becoming Urban: How Urbanization Influences the Loss of Arable Land in Peri-urban Hanoi," Computational Science and its Applications, 2013.