When Early Actions Save Lives: Anticipating Instead of Reacting with Forecast-based Financing

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ARMOR

Abstract

Forecast-based Financing (FbF) is an Early Warning Early Action (EWEA) approach that releases humanitarian funding for agreed-upon early actions before weather-related hazard events. Forecast data help determine which actions to fund in anticipation of the hazard events to most effectively reduce negative impacts. The four components of FbF are (1) the trigger, which establishes where and when the implementation of early actions begins, (2) the predefined early actions, which aim to minimise the negative impacts of the hazard event, (3) the automatic release of funds from the dedicated financing mechanism of the International Federation of Red Cross and Red Crescent Societies (IFRC) following the activation of a trigger, and (4) the delivery, consisting of the implementation of the pre-identified early actions.

The Philippine Red Cross (PRC) developed an Early Action Protocol (EAP) for tropical cyclones (TCs) that enables the implementation of early actions focusing on the most at-risk municipalities. The EAP adapts to the local contexts of these municipalities by encouraging the strengthening of vulnerable houses, early harvesting of mature crops, and evacuation of livestock.

In Viet Nam, the Viet Nam Institute of Meteorology, Hydrology and Climate Change (IMHEN) and the Viet Nam Red Cross Society (VNRC) established a trigger for heatwaves. The trigger conditions help VNRC identify the urban areas that are most vulnerable to heatwave impacts by overlaying data for vulnerability, exposure, and hazards.

FbF is an excellent example of how humanitarian partners can help affected communities respond to short-term climate change effects as weather-related hazard events become more frequent and intense. FbF is adaptable to the local context and identifies early actions tailored to the impact that specific local communities experience. This customisation means that a single hazard event, such as a typhoon, can trigger different early actions depending on the contextualised vulnerability and exposure analysis of the at-risk areas.

Keywords: Forecast-based financing, early warning early actions, community-based strategies

6.1 Introduction

The International Red Cross and Red Crescent (RCRC) Movement is pioneering FbF with the goal of anticipating disasters, mitigating their effects, and reducing human losses and suffering. FbF is an EWEA approach that releases humanitarian funding for pre-agreed early actions based on forecast and risk data to reduce the impact of hazard events. FbF has four main components:

- **Trigger:** the threshold or series of conditions that determine where and when the implementation of early actions should begin based on forecast and risk analysis. The trigger is linked to Impact-based Forecasting (IbF), which analyses the likely impact or damage from a hazard event.
- **Early actions:** actions that take place between an initial forecast and the onset of a hazard event. Early actions are tailored to the local context to effectively reduce existing vulnerabilities and exposure.
- **Financing mechanism**: IFRC established Forecast-based Action (FbA) of the Disaster Relief Emergency Fund (DREF) as a designated fund for FbF implementation. The RCRC National Societies (National Societies) and FbA agree in advance on the allocation of financial resources that will automatically be released following the trigger.
- **Delivery**: the implementation of pre-identified early actions. Investments in institutional and community capacity to act are crucial to ensure the reduction of the impacts of a hazard event.

Apart from the National Societies, FbF actors include other humanitarian partners such as the United Nations (UN) system, local and national government ministries, research institutes, and the private sector. The EAP outlines the roles and responsibilities of all actors during an FbF activation and summarises the four FbF components. The EAP is similar to a standard operating procedure in that it provides instructions to implement anticipatory actions effectively and without delay. Each EAP for a specific hazard can receive up to CHF 250,000 (or USD 257,000) per activation.

6.1.1 The Trigger: IbF

The trigger defines when and where the funds will be released and the early actions will take place based on an analysis of who and what is most likely to be affected. The trigger is linked to the IbF concept, which focuses on “what the weather will do” rather than the traditional analysis of “how the weather will be”. This analysis overlays the historical impact of a hazard, the exposure and vulnerability of communities in its path, and a forecast to predict which areas and communities will likely experience the most significant effects.

The 510 initiative of the Netherlands Red Cross (NLRC) developed an IbF model using datasets from 27 past typhoons (510 Global, n.d.). PRC uses the 510 model to help predict when and where housing will reach critical impact levels, contributing to the development of triggers.

The Indonesian Red Cross Society (PMI) is also exploring an integrated way of developing triggers. The PMI approach to IbF focuses on using a Government-led information management platform called InaSAFE FbA (InaSAFE FBA, n.d.). This platform integrates the forecast information from the Indonesian Agency for Meteorology, Climatology and Geophysics with risk data from OpenStreetMap and other government departments to identify the people and areas most likely to experience the consequences of floods. Support for the trigger development comes from a research investment by the Global Facility for Disaster Reduction and Recovery led jointly by Kartoza, an open-source geographic information system service provider, and the RCRC Climate Centre (Climate Centre). In time, IbF will allow the PMI to identify when and where it should activate its EAP.

The Mongolian Red Cross Society followed a similar trigger-development process. The organisation used a Government-generated IbF model with a risk map as an output. The model helps identify high-risk areas on a seasonal basis to enable anticipatory action before the effects of *dzud* (Mongolia’s phenomenon of severe winter conditions) occur.

6.1.2 Early Actions

Once the conditions of the trigger are observed, early actions need to take place in preparation for the hazard event. The FbF actors pre-identify and tailor the early actions to the local context to effectively reduce existing vulnerabilities. Early actions require contextualisation because the impact of a natural event varies greatly depending on the geographic location, and the same hazard can trigger different early actions across a region based on the local contexts.

PRC identified a set of early actions that can help reduce the impact of typhoons based on the local context. In Catanduanes, one early action is premature harvesting or trimming of mature abaca trees to protect them from damage. Camarines Norte prepares for the same typhoon by providing shelter-strengthening kits to vulnerable houses to withstand the high winds. Chapter 6 provides additional details on FbF for typhoons in the Philippines.

When implementing early actions, the FbF approach acknowledges the challenges of forecasting typhoons and other natural hazards. It employs a "no regrets" policy in which, even if the hazard event does not occur or is not as severe as predictions stated, the early actions still take place to reduce the vulnerability of beneficiaries, and reimbursement of funds for these actions is not necessary.

6.1.3 Funding Mechanism: FbA by the DREF

The IFRC has extended the scope of its long-standing global financing instrument, the DREF, to include FbA. IFRC launched this dedicated fund in May 2018. FbA by the DREF provides multilateral funding to National Societies that have already developed their EAPs.

Following Validation Committee approval, each EAP can receive up to CHF 250,000 or USD 257,000 towards the implementation of the early actions within its agreement to ensure adequate readiness (including pre-positioning). The funds are automatically released as soon as the trigger is reached to allow the implementation of early actions in the most at-risk areas, according to IbF. FbA by the DREF is an innovative financing mechanism within IFRC's broader disaster risk financing (DRF) framework, further reinforcing the transition from reaction to anticipation by guaranteeing speed and predictability of the funds.

The anticipatory funding mechanism of FbA by the DREF strengthens links, data sharing, and decision-making between the different phases of intervention in the disaster management cycle. Assessments of exposure, vulnerability, and affected areas are already available as part of the IbF of FbF, allowing earlier emergency preparedness and response activities. FbA by the DREF thereby streamlines the integration of an anticipatory approach into traditional emergency response such that National Societies can implement preparatory measures and more rapid emergency response.

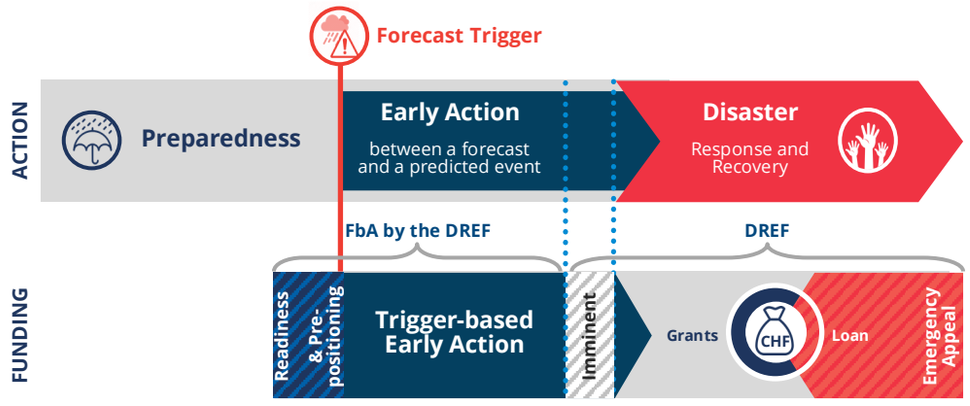

Figure 6.1
FbA by the DREF and DREF process (source: IFRC).

6.1.4 The Delivery

FbF relies not only on a trigger and an ex-ante financing mechanism but also on the capacity of National Societies to implement the early actions between a forecast and the onset of the hazard event. It is essential to have well-trained and equipped RCRC staff, requiring continuous capacity-building and organisational development. Similarly, local actors and disaster risk management authorities need to be capable of acting on a forecast and have trained staff available to implement early actions.

In addition to the personnel, RCRC also needs to adapt and strengthen its internal processes for procurement, logistics, and finance to ensure the delivery of goods and availability of services without delay. From a procurement and logistics perspective, FbF's need for short lead times when implementing early actions poses a challenge. At the same time, it is an opportunity to streamline internal processes and facilitate the delivery of goods and services, not only for FbF but also for traditional emergency response. In that sense, FbF contributes to making traditional response processes more risk-informed and anticipatory.

Similarly, FbF encourages new ways of transferring funds, both internally between IFRC and National Societies offices, as well as externally to beneficiaries. In Bangladesh, for example, the FbF project explored innovative ways of using mobile money and financial service providers to deliver unconditional cash grants within one day. This exploration included discussions with the Ministry of Finance, which regulates the quickly evolving financial landscape, and with mobile network operators that emerged as new and competing financial service providers.

Furthermore, FbF requires faster and more efficient identification of beneficiaries. As the impacted area changes with every hazard event, the beneficiaries also change, calling for the implementation of new or adapted systems to identify the most affected communities and households within hours or days after receiving a forecast. In addition to adapting traditional methods of beneficiary identification, RCRC is also exploring new approaches and seeking new partners to achieve this target. Discussions with the United Nations International Children's Fund (UNICEF) and other entities at the regional and national levels aim to evaluate how shock-responsive social protection (SRSP) systems can provide pre-identified and verified beneficiary names. This investigation is in line with global efforts to scale up FbF and to make traditional disaster risk reduction (DRR) and response approaches more anticipatory.

6.2 FbF In the Broader Anticipation Framework

FbF fits into the broader narrative of anticipatory approaches, which recognises that while climate change and the resulting consistent increase in extreme weather events affect everyone, they do not affect everyone equally. The poorest and most vulnerable populations disproportionately experience negative impacts, and climate change continues exacerbating their existing vulnerabilities. FbF is an innovative example of how the RCRC Movement helps affected communities to deal with the shorter-term climate change impacts as the severity and frequency of extreme weather events increases further.

FbF creates an enabling environment for communities to act in anticipation of an oncoming hazard event. It focuses on the local levels that suffer the consequences first, helping communities to understand a scientific forecast and translate it into actionable measures before, during, and after a hazard event. FbF empowers people, communities, and institutions to use science to make decisions and take action. National Societies are currently developing FbF in over 20 countries.

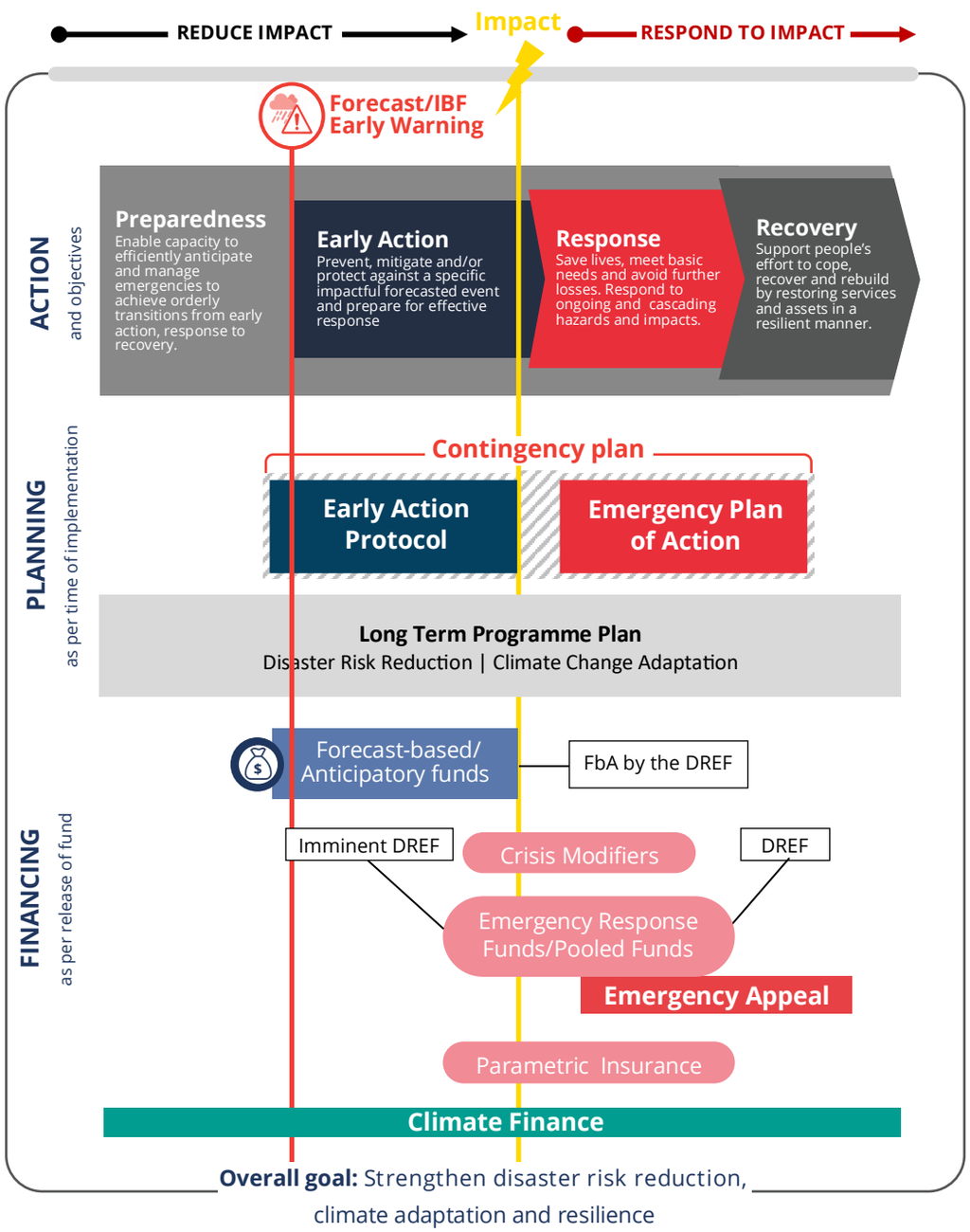

Figure 6.2
IFRC's DRF framework (source: IFRC).

FbF is also a part of IFRC's effort to strengthen its DRF systems to manage disasters of varying levels of severity and frequency by applying different types of financial instruments, such as contingent financing and insurance (Figure 6.2). Contingent financing, DREF, and FbA by the DREF enable pre-agreed arrangements for National Societies to receive funds after reaching trigger conditions. This rapid and predictable type of financing is applicable for small to medium hazard events. Insurances and regional risk pools, which IFRC is currently exploring through the Southeast Asia Disaster Risk Insurance Facility, offer more substantial, scalable, rapid, and predictable financing. The costs of premiums can be higher but are appropriate for larger events. Both of these ex-ante instruments can offer predictability that conventional IFRC emergency appeals do not.

DRF strengthens risk management by arranging financing in advance of crises through the use of supporting data and pre-planning. The design of FbF aims to make finance release rapid and predictable for governments to respond to a disaster, making it a critical DRF tool for funding anticipatory humanitarian action. States and organisations from global frameworks, such as the Global Platform for Disaster Risk Reduction, the United Nations Climate Change Conference, and several UN resolutions, have widely endorsed FbF as an innovative tool for better management of climate change and disaster. External research also shows that "developing an FbF mechanism that, based on early warnings, provides the institutional and funding arrangements that allow humanitarian actors to carry out pre-disaster activities to reduce potential losses and damages, effectively bridges the humanitarian and the development sectors" (Lopez et al., 2020). In addition to contributing to the humanitarian-development nexus, FbF has global relevance as it "can be scaled up in disaster-prone areas worldwide to improve effectiveness at reducing the risk of disasters" (de Perez et al., 2015). As the number of FbF projects grows globally, "the value of FbF systems will be greater than simply the losses avoided when the fund is released. If such a system is in place, actors in that region will be aware that many disaster effects are likely to be prevented due to FbA" (de Perez et al., 2015).

6.3 FbF for Typhoons in the Philippines

PRC developed its first EAP for TCs, the most frequent and impactful hazards affecting the Philippines, with the technical support of the German Red Cross (GRC), the Climate Centre, and the 510 initiative of NLRC. The EAP identifies the pre-agreed early actions that aim to mitigate the negative impacts of typhoons on livelihoods and housing. It also outlines how PRC will implement the anticipatory action for extreme typhoon events with a return period of at least five years. IFRC approved the typhoon EAP in November 2019 for activation in a total of 19 provinces. It selected provinces in which the respective PRC chapters (branches) had received training on the concept of FbF, and where the provincial DRR management (DRRM) partners had discussed and identified the early actions.

The trigger that activates the EAP links to a typhoon's forecasted impact, in accordance with the IbF concept. Based on a scientific analysis of historical typhoon events, the trigger threshold for implementing early actions is reached when the predicted impact of a typhoon 72 hours before the onset is total damage to 10% of the houses in at least three municipalities. At the lead time of 72 hours before the typhoon landfall, the accuracy of the forecast is at 70%. The accuracy and lead time allow PRC to act on the other factors while also acknowledging the forecast's average margin of error of 300 km.

The 510 initiative of NLRC developed a statistical model using datasets from 27 past typhoons (TC characteristics and corresponding house damages) to help PRC predict the time, location, and level of impact of typhoons (Figure 6.3) (510 Global, 2019a).

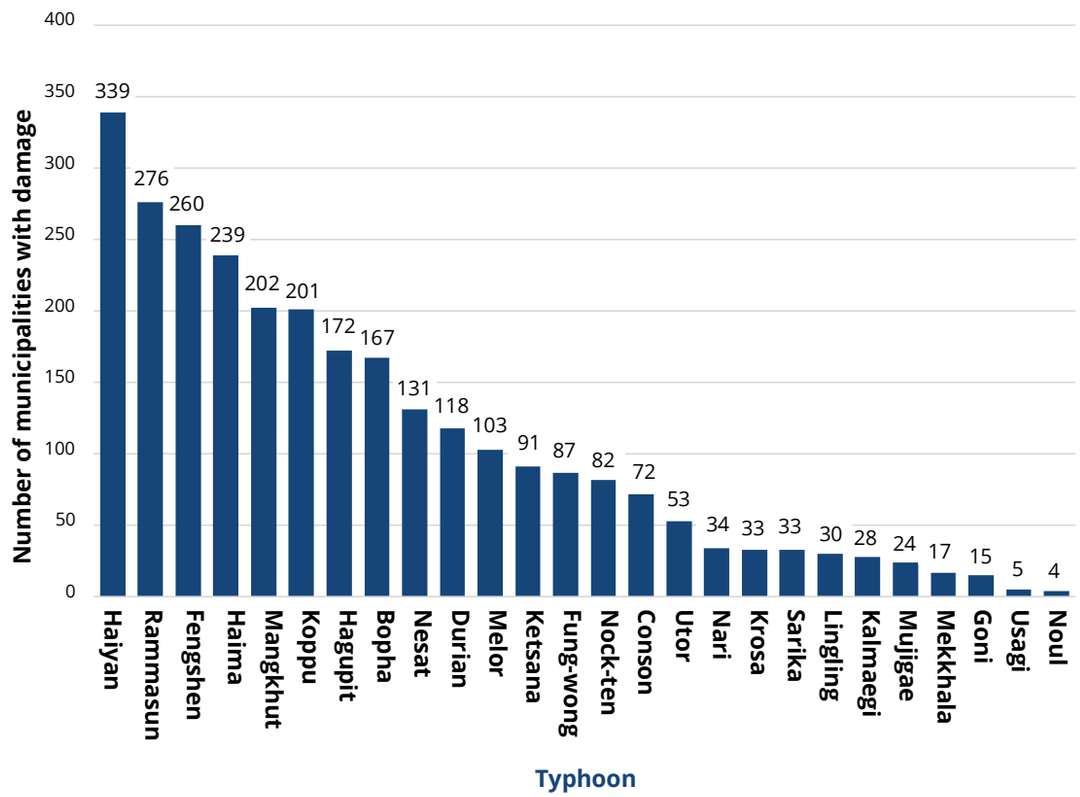

Figure 6.3
The 510 statistical model's TC damage data (source: 510 Global, n.d.).

As typhoons differ from case to case, the 510 team decided to predict absolute levels of damage in terms of the percentage of totally damaged houses per municipality. The predictions provided by 510 divide all municipalities into five classes of damage, with class 1 representing the lowest level of damage and class 5 the highest. When assessing the accuracy of these predicted damage classes against true damage classes (Figure 6.4), the model proves accurate enough to be applicable.

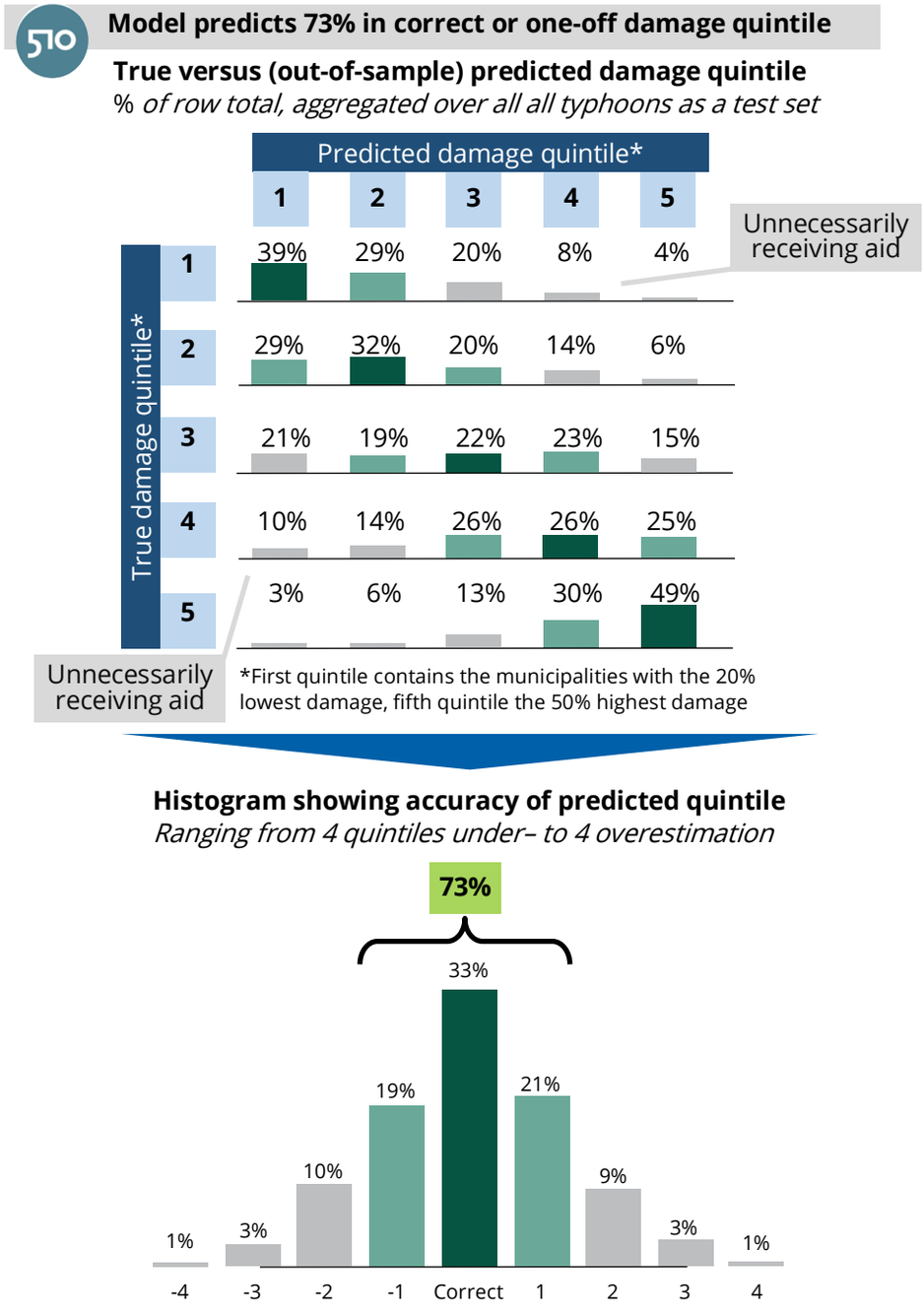

Figure 6.4

Accuracy prediction of the 510 statistical model (source: 510 Global, n.d.).

Regarding the early actions that aim to reduce the impact of typhoons on livelihoods and housing, PRC's EAP proposes the implementation of three contextualised early actions in the most at-risk municipalities:

1. **Strengthening of vulnerable houses in coastal areas with shelter-strengthening kits (SSKs):** the kits help vulnerable households to reinforce the roofs and walls, improving the shelter's ability to withstand strong winds and mitigating damage.
2. **Early harvesting of mature crops such as rice and abaca to help farmers maintain their agricultural livelihood:** abaca trees, for example, will not produce high-quality abaca fibre if they are damaged, leading to an income loss of up to 40% (based on focus group discussions from PRC and GRC with beneficiaries in Catanduanes). Uprooting abaca trees also results in losses as it can take up to two years for them to regrow.
3. **Evacuation of livestock and assets**: evacuation is a flexible early action that can target areas exposed to not only the severe winds but also the risk of flooding or landslide. This early action will also contribute to reducing the loss of lives, as many livestock owners are reluctant to evacuate without their animals and will remain in at-risk areas to avoid it.

A series of simulation exercises in 2019 thoroughly tested these three early actions (Abangan, 2019) and performed successfully during Typhoon Kammuri (locally known as Typhoon Tisoy) at the end of November 2019 (see section 6.1). The tests showed that PRC has the capacity to complete preparatory work three days ahead of the typhoon landfall and to implement the early actions two days before impact.

6.3.1 Test Activation During Typhoon Kammuri

When Typhoon Kammuri formed and entered the Philippine Area of Responsibility at the end of November 2019, PRC monitored the Philippine Atmospheric, Geophysical and Astronomical Services Administration's forecast of the typhoon track. PRC asked the 510 team to run the 510 statistical model to determine if the hazard event would reach the trigger level. The team ran the model from forecast day -5 (Thursday, 28 November 2019) to day -1 (Monday, 2 December 2019) using wind and track forecasts from the University College of London (Figure 6.5) (510 Global, 2019b). The impact-based forecasts confirmed that at least three municipalities would sustain total damages to more than 10% of houses in the northern provinces of the Bicol region. The data allowed PRC to make an informed decision about when and where to implement early actions to mitigate the damages. Based on the data, PRC tested its pre-agreed early actions in Catanduanes and Camarines Norte provinces, starting 72 hours before the typhoon landfall.

For Typhoon Kammuri, PRC was able to implement all three pre-agreed early actions at a small scale:

- Five barangays (the lowest administrative entities) in Catanduanes performed early harvesting and trimming of mature abaca trees. The PRC branch deployed 10 volunteers in the five barangays in the morning of day -3. Each team of volunteers was in charge of validating with the local authorities the list of farms that would benefit from the early action. PRC also recruited 20 workers in each barangay for undertaking the early harvesting.
- In Camarines Norte, municipal authorities selected and provided SSKs to a total of 10 vulnerable households in two coastal barangays. PRC deployed four volunteers and employed five workers per barangay to effectively and quickly install the SSKs.
- Evacuation of livestock primarily targeted two barangays prone to flooding that had previously lost livestock during Tropical Depression Usman in December 2018. PRC recruited 17 workers to support the preparation of a pooling area with appropriate fencing on day -3 at the provincial DRRM training centre. The DRRM office also disseminated information on the afternoon of day -3 and helped coordinate transportation for the following day. However, the rapid shift of the typhoon track in the 24 hours prior to landfall towards the southern provinces of the Bicol region prevented the team from fully demonstrating the added value of this early action.

A month after Typhoon Kammuri's landfall, the FbF team returned to Camarines Norte and Catanduanes to conduct an after-action review and collect feedback from communities that benefited from the early actions. The team also interviewed PRC branches, local government units, and other implementing partners. All interviewees confirmed the relevance of PRC's early actions and their usefulness in reducing the typhoon's impact on livelihoods and homes. The interviews revealed that all participants unanimously considered anticipatory action a positive innovation that complemented the pre-emptive evacuations undertaken on day -1. The review also confirmed PRC's capacity to implement early actions before the typhoon landfall.

In order to strengthen the link between FbF and response, the 510 team proposed the provision of maps of the estimated impact starting after landfall and continuing until the typhoon exits the Philippine Area of Responsibility. This information would allow PRC to prepare for early response.

SSK beneficiaries interviewed confirmed that the kits contained appropriate items for reinforcing their houses. Non-beneficiaries sustained more severe damages than beneficiaries (Figure 6.7) despite strengthening their houses (Figure 6.6), particularly in the province of Catanduanes, which has higher exposure and vulnerability compared to Camarines Norte. The repairs cost up to PHP 2,000 per beneficiary (primarily for roofs) and up to PHP 5,000 per non-beneficiary (primarily for roofs and walls).

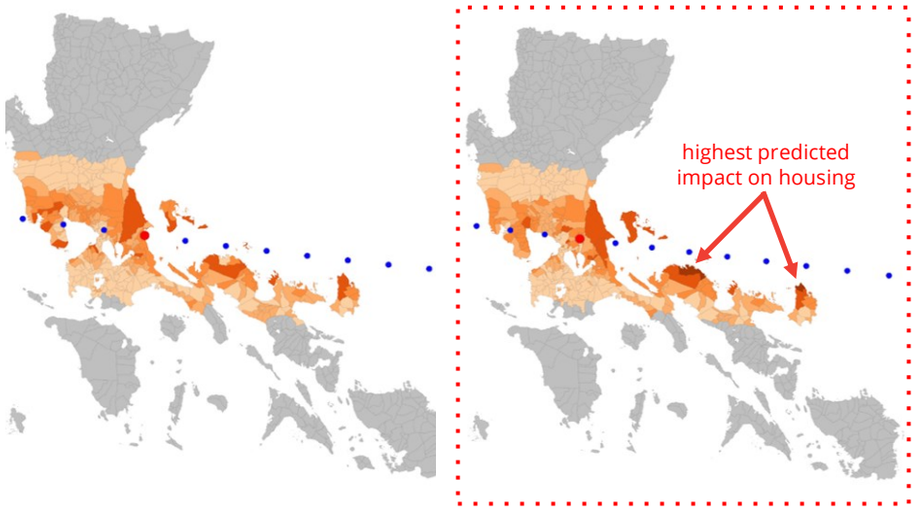

Figure 6.5

Impact-based forecast model by the 510 initiative 96 to 24 hours before the landfall of Typhoon Kammuri (source: 510 initiative of NLRC).

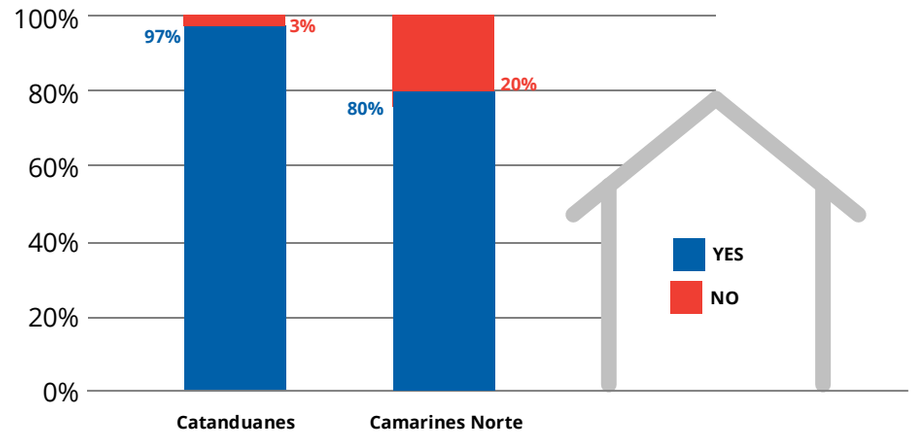

Figure 6.6

Percentage of non-beneficiaries that conducted house strengthening.

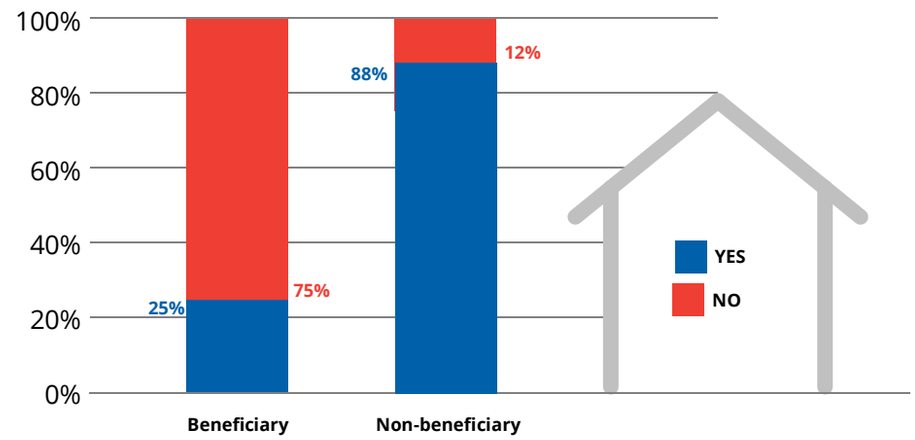

Figure 6.7

Comparison of house repairs needed after Typhoon Kammuri.

Figure 6.8

Cutting of Abaca trees in Catanduanes (source: PRC).

Figure 6.9

Installing SSKs in Camarines Norte (source: PRC).

6.4 FbF For Heatwaves in Viet Nam

During the past 40 years in Hanoi, the number of days with maximum temperatures exceeding 35°C increased at a rate of two to three days per decade, resulting in a total of 175 days with maximum temperatures above 35°C from 2008 to 2012 (Thuc et al., 2016). IMHEN conducted a risk analysis for the FbF project, confirming this trend. The risk analysis found that the number of heatwaves (events with at least two consecutive days reaching over 35°C) has increased by 107% from the 1975–1984 period to the 2005–2014 period, increasing from 45 events to 93 events, respectively (Figure 6.10).

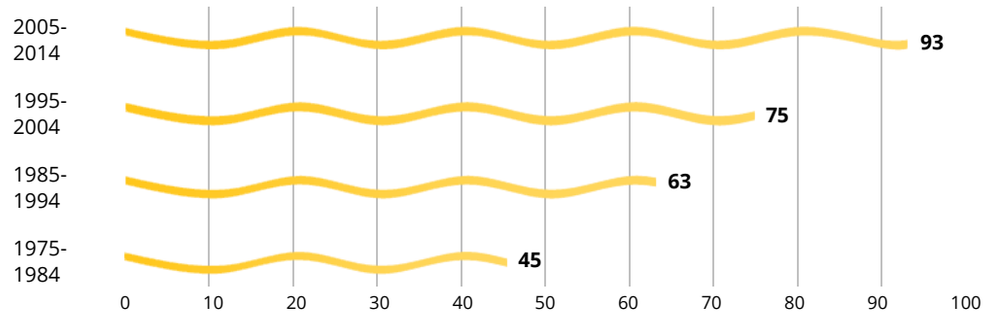

Figure 6.10

Statistics of the number of heatwaves in Hanoi for each decade of the period 1975 – 2014.

The heatwaves also lasted longer in later decades. During the entire 1975–2014 period, 92% of the heatwaves had a duration between two and six days (Table 6.1). However, the ratio of heatwaves with a duration of four to six days increased over time, standing at 21.3% for the period 1975–2014 and 30.1% for the 2005–2014 period.

In Hanoi, heatwave events correlate with a 20% increase in hospital admissions for all causes and a 45.9% increase for respiratory diseases (Phung et al., 2017). In 2018 and 2019, VNRC carried out surveys with more than 1,200 Hanoians to assess the impacts of heatwaves and the vulnerable groups' access to weather forecasts during extreme heat events. The results showed that 66% of the people from vulnerable groups, such as those living in poor neighbourhoods, builders, street workers who ship goods, and street vendors, had experienced four to seven symptoms of heat exhaustion, and 22% of those with symptoms went to the doctor during a heatwave. Additionally, in June 2019, two outdoor workers in Hanoi reportedly died due to exposure to high heat for long hours.

VNRC and GRC, working closely with IMHEN, saw the opportunity to implement anticipatory humanitarian actions in Hanoi. Short-term forecasts make predicting heatwaves possible in the city, with a forecast range of three to 10 days before the event (de Perez et al., 2018). VNRC, GRC, and IMHEN

are pioneering the implementation of FbF for heatwaves in an urban context, with the main objective of reducing the impact of heatwaves on Hanoi's most vulnerable populations. As each heatwave can affect a large area, the organisations recognised the need to identify the most at-risk zones. This is particularly true in urban contexts where vulnerability and heatwave hotspots are highly variable and increase due to urbanisation (Trihamdani, Kubota, Lee, Sumida, & Phuong, 2017).

Using the open-source software QGIS and the Database of Global Administrative Areas, VNRC and GRC developed a decision-making methodology. The methodology produced three layers of information—vulnerability (V), exposure (E), and hazard (H)—to identify the urban areas that are most vulnerable to heatwave impacts.

Defining the V and E layers required answering three questions:
1. Which are the most vulnerable populations?
2. Where are those populations located?
3. How are they exposed?

VNRC identified the most vulnerable populations through data collection, literature review, and the application of knowledge, attitudes, and practices surveys. These surveys also assessed the individual needs and living conditions of those vulnerable groups. VNRC used the data from the surveys to assign values to the V and E layers. The V layer quantifies the percentage of people who are poor, elderly, disabled, or under the age of 5 in each ward of the city. The E layer quantifies the rate of people living in slums, in inadequate housing, or without air-conditioning.

Layer H then identifies urban heat islands (UHIs)—the areas with higher concentrations of heat across the Hanoi region (Martin-Vide, Sarricolea, & Moreno-García, 2015). An assessment of heatwaves in Hanoi highlighted that the hottest days mainly occur from May to August.

Additionally, changes in land use in Hanoi are significant from year to year due to rapid urbanisation (Pham, Tong, & Pham, 2013). VNRC used Landsat 8 data, including 21 satellite images, for the summer months (May to August) from 2015 to 2018 to construct a heatwave hotspot map. It includes the data of the maximum temperature during those 21 days. The maximum value is chosen by representing the heat storage capacity of Hanoi, which is an important mechanism for the UHI effect (McGregor, Bessmoulin, Ebi, & Menne, 2015).

Compiling the V, E, and H layers allowed identification and selection of the 10% highest-risk wards in Hanoi for early action implementation to minimise the impacts of heatwaves. The same methodology also identified and selected the 10% highest-risk wards in Danang.

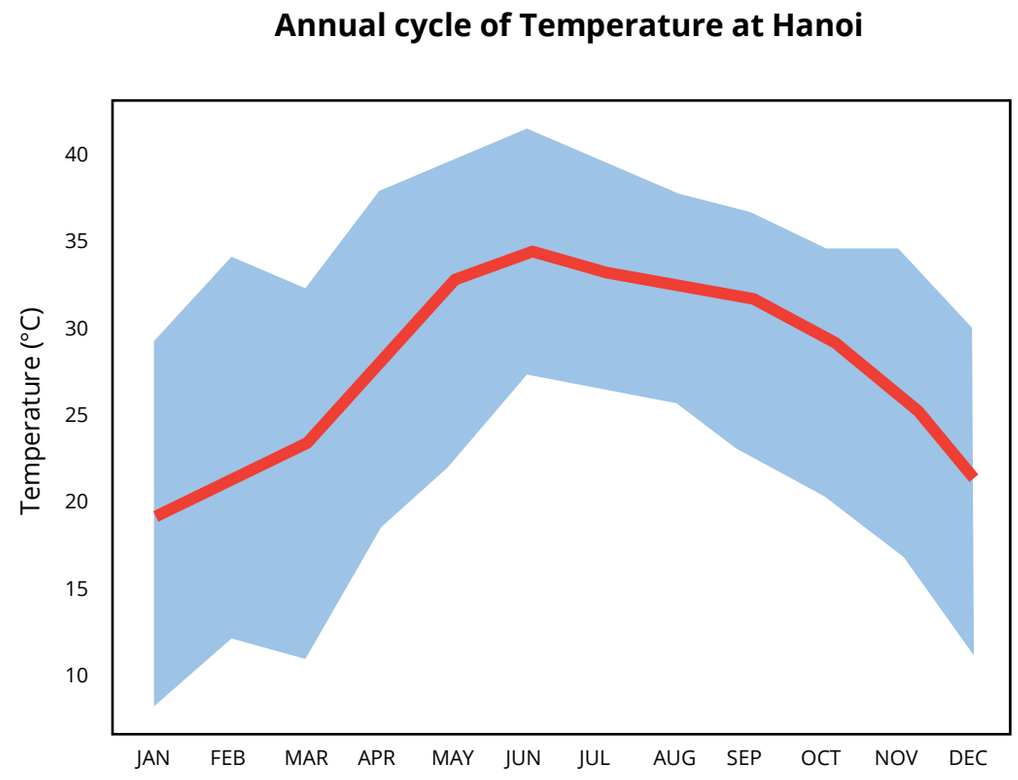

Figure 6.11
Annual cycle of observed maximum daily temperature in Hanoi during 2009-2018. The red line shows mean values, and the blue shade presents the range from minimum to maximum values.

VNRC adapted the impact mapping methodology for cyclones and floods and trained staff from 20 of its branches to develop maps that replicate the FbF approach for other disasters and regions of Viet Nam.

HEATWAVE IMPACT FORECAST MAP IN HANOI URBAN DISTRICTS

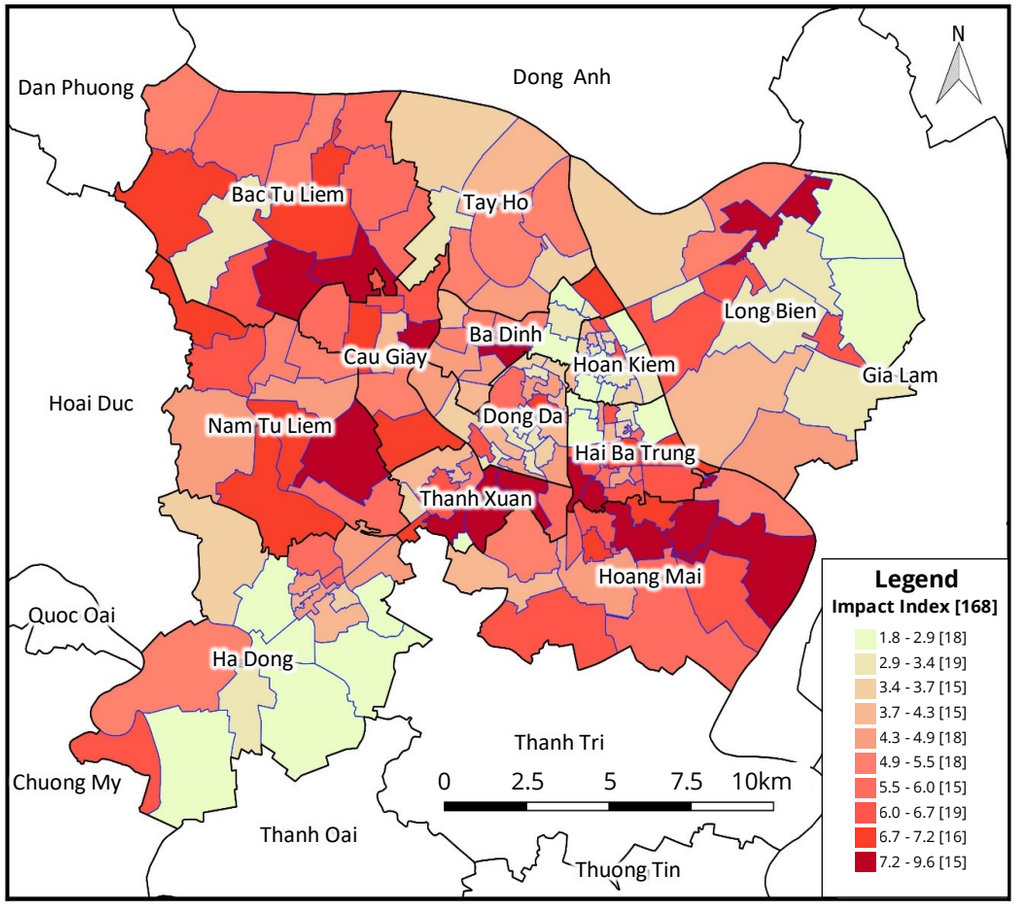

Figure 6.12

The risk levels of Hanoi's 168 wards based on impact mapping methodology (source: VNRC).

The early action for heatwave events involves opening Red Cross cooling centres that provide free access to places with cool shade during the day for vulnerable people, such as outdoor workers. Each cooling centre consists of a tent equipped with a sprinkler system, roof fans, and evaporative coolers that help lower body temperature via skin moisture evaporation. Evaporative cooling is a very efficient way to regulate the body's temperature and prevent harmful effects such as heatstroke. Red Cross cooling buses complement the cooling centres by travelling through the main streets of Hanoi and directing the vulnerable people to the centres. The cooling buses also conduct visits to informal settlements to raise awareness and distribute cold towels and beverages.

The average temperature difference between inside and outside of the cooling centres is 7–10°C. The centres have an emergency care protocol in place whereby volunteers provide individual healthcare based on symptoms that the visitors might be experiencing. If the volunteers identify a high risk of heatstroke, they immediately call an ambulance. The early action also encourages visitors to adopt appropriate behaviour changes. As they gain awareness about heat-related illnesses and experience an improvement in their condition after using the cooling centres, visitors tend to start taking more regular and extended breaks in cool environments, thus reducing potential risks.

Triggers determine when to implement heatwave early action. IMHEN established that the trigger for an extreme heatwave event consists of a forecasted heat index exceeding the 99th percentile during more than two consecutive days. The trigger mechanism has two lead times. A six-day lead time acts as a readiness trigger to start preparing the early action. The FbF protocol is activated only if the conditions of the second trigger still occur at the second lead time of three days. At that point, VNRC automatically releases funding and implements the early action. In summer 2019, the trigger conditions occurred twice, leading to the testing of the early action in selected wards. During the first heatwave, two cooling centres opened in two wards and received a total of 396 visitors, of which 70.5% reported feeling

better after their visit. During the second heatwave, four centres and three buses received a total of 1,787 visits in four days and four wards. During the second heatwave, 79% of the visitors were outdoor workers, and over 95% of all the visitors reported feeling satisfied and recommended the reopening of the centres.

In 2020, the early action will scale up to 15 at-risk wards in Hanoi and seven wards in Danang, with a total of 45 tents and 22 buses prepared to handle 20,000 visits. This scaling-up aims to improve performance indicators and confirm the positive impact of early actions.

6.5 Regional FbF Coordination

Coordination and collaboration with FbF and EWEA partners, including the United Nations World Food Programme, the Food and Agriculture Organization, and international non-governmental organisations such as the Start Network, are key to scaling up FbF/EWEA in the Asia-Pacific region. One example of such coordination is the regional technical working group (TWG) on FbF/EWEA and SRSP. Members of the group include GRC/IFRC, the Food and Agriculture Organization, the United Nations World Food Programme, UNICEF, the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia, and other relevant UN agencies.

The regional TWG aims to harmonise FbF/EWEA methodologies and ensure joint advocacy with the Association of Southeast Asian Nations (ASEAN). In 2020, it seeks to develop a repository of effective early actions for specific hazards and conduct an FbF/EWEA feasibility study in Myanmar. This coordination mechanism at the regional level is an example of how to move FbF to the next stage and ensure alignment of regional and national efforts and needs.

TWG members also aim to identify and address some of the challenges of implementing FbF/EWEA. Comparing the lead time for certain hazards to the necessary implementation time for the early actions should lead to an honest discussion about which hazards lend themselves to the FbF/EWEA approach. While the FbF/EWEA mechanism shows some uptake and buy-in at the national level, it remains small-scale compared to the traditional responses. Therefore, the strategies for scaling up anticipatory actions still require refining. Collaboration with humanitarian partners offers one path to do so, but additional methods will likely be necessary as well. Similarly, the logistics and capacity challenges associated with scaling up will require not only creative solutions but also an internal restructuring of processes.

Successful advocacy to government ministries for the integration of the FbF/EWEA mechanism into national- and local-level legislation will require larger empirical datasets on the impact reduction of early actions. For further development of IbF, IFRC and the Climate Centre established coordination mechanisms with WMO, the Climate Risk and Early Warning Systems initiative, the United Kingdom's Meteorological Office, and selected national hydro-meteorological services and DRR agencies. The objective is to jointly contribute to the further development of IbF services tailored to the humanitarian sector. Similarly, the Asia Regional Resilience to a Changing Climate programme, with support from the United Kingdom's Department for International Development and the World Bank, is exploring new ways to sustainably and effectively co-develop IbF services with National Societies.

At the national level, and with a potential regional impact, the Philippine Atmospheric, Geophysical and Astronomical Services Administration will play a key role under the Green Climate Fund in the development of IbF services for typhoons and other hazards aligned with the previous IbF work of PRC.

6.6 Conclusions and Recommendations

IFRC's advocacy efforts with ASEAN aim to promote the FbF approach and institutionalise it by including it in the 2021 – 2025 edition of the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) Work Programme. AADMER serves as a common platform and regional policy backbone for disaster management in the ASEAN region, while the ASEAN Coordinating Centre for Humanitarian Assistance on disaster management is the operational coordination body and engine of AADMER. Both are essential advocacy partners for promoting the institutionalisation of the FbF approach. Because FbF produces vulnerability and exposure assessments before a disaster, it provides an ideal entry point for heightened risk awareness as well as faster or earlier response. Shared understanding of risk can lead to the implementation of preparedness measures coupled with IbF to ensure that resources for response are ready when and where they are necessary. The goal for FbF is not only to prove the concept of anticipation but also act as a catalyst for inspiring other more risk-informed and anticipatory programmes in the ASEAN region and beyond.

While FbF promotes an anticipatory mindset, it also strengthens humanitarian mandates by enabling National Societies to assist people in need more quickly and effectively. As internal processes become more agile in delivering aid and services under FbF, the emergency response processes profit equally. In that sense, FbF also contributes to the enhancement of responses.

Similarly, FbF encourages new ways of thinking in other areas, such as SRSP. Discussions with UNICEF and other stakeholders at the regional and national levels look at how employing the SRSP network can provide quicker identification of beneficiaries. This investigation is in line with global efforts to scale up FbF and to make traditional response or DRR approaches more anticipatory to shorter-term climate events.

With ever-increasing climate change challenges, FbF offers an innovative and localised solution to adapt to the shorter-term climate change effects most heavily impacting vulnerable communities. By implementing the FbF approach, the RCRC Movement and its partners are transforming into a more forward-looking and future-proof network, ensuring that they can meet the needs of the most vulnerable communities now and in the future.

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