GUIDANCE NOTE on FbF in Urban Areas - experiences and lessons

Climate Centre

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The authors would like to thank the following people (in alphabetical order) for their generous time in shaping the direction of this guidance note and/or reviewing its contents:
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Recommended Citation

Jjemba, E., Khan, R., Heinrich, D., Kruczkiewicz, A., Smarczyk, T., Urban FbF guidance note for Red Cross Red Crescent National Societies. Guidance Note. 2023. Red Cross Red Crescent Climate Centre.

This work was carried out with support from the German Red Cross, the Netherlands Red Cross, IKEA Foundation. We also thank the Norwegian Red Cross and the Norwegian Ministry of Foreign Affairs for providing additional resources to develop this guidance note.

NB: this guidance note is intended to be a living document and revised as case studies emerge. The first revision was developed in April 2023.

Content

Background

The world is urbanizing at an unprecedented rate. Today, 56.6 per cent of us – more than half of the world's population – lives in cities. This number is increasing by approximately 1.4 million people each week. By 2050, two-thirds of the world's population will be living in cities and towns, with over 95 per cent of growth happening in the less developed parts of East Asia, South Asia and Africa[1]. Natural hazards such as droughts, floods and heatwaves, coupled with poor air quality, are occurring more frequently and at a greater magnitude in urban settings. These natural hazards impose huge stress on cities, making them increasingly vulnerable. This is partly due to rapid, unplanned urban growth; poor and failing infrastructure; faulty planning; and the encroachment of cities on natural resources and ecosystems.

The impacts of climate change along with limited access to weather and climate information, coupled with governance challenges, compound cities' vulnerability to natural hazards. Extreme weather events pose a significant and growing risk, contributing to socioeconomic losses in cities. For example, in the devastating 2015 Chennai floods in South India, around 470 people were killed, close to half a million houses were damaged[2] and the city incurred economic losses, approximating three billion[3] US dollars. Floods are not the only hazard having increasing impacts on Chennai. In summer 2019, the city experienced widespread water scarcity that led to the closure of schools, restaurants and hotels. Similarly, the city of Cape Town in South Africa experienced a serious drought between 2015–2018 which threatened the water supply of nearly four million people. In March 2019, cyclones severely damaged Beira (Mozambique) and its suburbs with heavy rains and winds killing several people and leaving many homeless.

Disasters are not affecting everyone equally as people residing in informal settlements are more exposed and have less capacities to respond: Located close to rivers and streams, having a poor quality of housing, often coupled with an insecure residential status, while receiving less support through the government, these most vulnerable populations are the focus of RCRC interventions.

The above-mentioned examples show how disasters affect urban areas: millions of people can be affected at the same time which can overwhelm capacities of humanitarian systems that are often already stretched, requiring new approaches. Anticipatory actions present a unique opportunity to protect lives and livelihoods in advance of urban disasters – by using innovative technologies and approaches, data and weather forecasts and working with the city network.

1 United Nations Department of Economic and Social Affairs (UNDESA) https://www.un.org/development/desa/publications/2018-revision-of-world-urbanization-prospects.html

2 http://www.indiaenvironmentportal.org.in/files/file/Disaster%20in%20Chennai.pdf

3 https://www.thehindubusinessline.com/news/national/chennai-floods-largest-natural-catastrophe-in-india-in-2015-swiss-re/article8413852.ece

Forecast-based Financing in Urban Areas

While Anticipatory Action has multiple forms in the application of Red Cross Red Crescent Societies, this guidance note is particularly focusing in on Forecast-based Financing (see page 14). Why is that? Because most of the few examples for Anticipatory Action have been made in projects that apply Forecast-based Financing methodology, which aim at creating (simplified) Early Action Protocols ((s)EAP), which in turn are financed by the DREF.

For now anticipatory plans and protocols have often been developed with a focus on impacts in rural areas. Yet there is a growing base of examples and experiences on FbF in urban areas to build on. Yet there is a growing base of examples and experiences to build on. This guidance note provides a practical guide and resources for practitioners intending to set up anticipatory mechanisms such as Forecast-based Financing (FbF) in urban contexts. Suggestions in the guidance note integrate knowledge and perspectives from a variety of sources, including expert views from regional and global FbF dialogue platforms, literature reviews and lessons from pilot projects.

The guidance note is divided into three sections. The first is devoted to understanding the urban context for humanitarian actors. This section explains what is meant by the 'urban' context, providing examples of the tools used to build understanding. Next, we examine the implementation of anticipatory approaches in urban contexts and the possible contrasting approaches used in other contexts. Lastly, we provide some final thoughts and conclusions that highlight the gaps which should be covered enabling humanitarian actors to successfully scale-up anticipatory approaches in rapidly urbanizing but vulnerable areas around the world.

Understanding the urban context

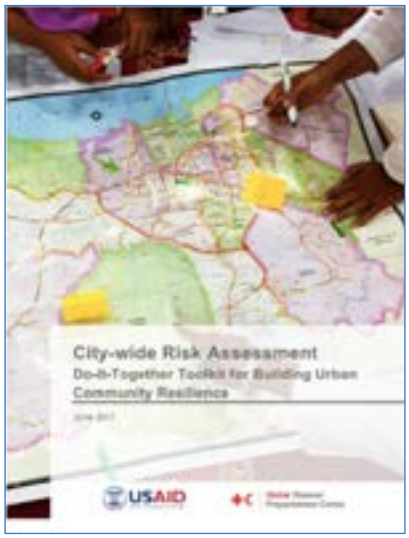
Countries define urban areas and cities differently, based on their policies. Definitions of "urban" or "cities" can differ considerably depending on the country, making comparisons between cities challenging. Recently, the degree of urbanization has been adopted to harmonize the definition and characterization of cities[4].

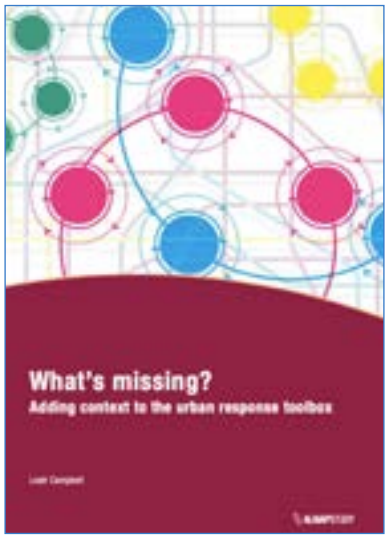
According to a given geographical location, the status of a city or urban context ought to come with benefits that increase basic service delivery to its inhabitants. However, this is not always the case. Cities provide both opportunities and challenges for project design and implementation. The uniqueness of cities is largely attributed to high concentrations of people, infrastructure, and services. The urban setting is also highly diverse and ever-changing. Understanding the urban context (e.g. socioeconomic factors, the different actors involved and decision-making processes) is critical to the successful implementation of urban anticipatory projects.

As noted in IFRC's Urban Resilience Guide, cities call for "multidimensional and multisectoral approaches to address underlying drivers of risk in the urban context".[5] Urban livelihoods are primarily cash-based and access to resources and basic services is greatly hindered by existing inequalities in cities. To understand the urban context, various organizations have come up with tools that help humanitarian actors, three of which are highlighted here:

4 Cities are now defined based on the degree of urbanization. Cities have a population of at least 50,000 inhabitants in contiguous dense grid cells (>1,500 inhabitants per km^2). Look for your city here https://ghsl.jrc.ec.europa.eu/CFS.php.

5 https://media.ifrc.org/ifrc/wp-content/uploads/2017/12/1317300_GuidanceUrbanResilience_LR25b15d.pdf





a. City-wide Risk Assessment – developed by the Global Disaster Preparedness Centre (GDPC). This tool uses systems-thinking to identify root causes and prioritize shocks and stresses as well as vulnerabilities that impact a city.

b. Urban context analysis toolkit – this tool is designed to help humanitarian actors intending to respond to man-made crises emerging in cities. It uses key informant interviews and focus group discussions to collect data on: politics and governance; social and cultural; economics; service delivery and infrastructure; and space and settlement.

c. What's missing? – this paper provides an overview of the tools that humanitarian actors can use to understand the urban context.

Examining differences in the implementation of FbF/A in urban and rural contexts

In many countries, the divide between urban and rural is not very clear and there are many peri-urban areas, or transition areas. However, three main elements of cities require a closer look to make the implementation of FbF within them successful: the diversity of cities, their density and their dynamism.[6]

Diversity: Mostly related to economic, ethnicity, infrastructure, religious and social dimensions, which have implications for FbF programming.

- Cities have a high concentration of people with diverse livelihoods, ethnicity and cultures. Awareness of this complexity of groups living next to one another must inform the mechanisms for selecting the target population during the activation of Early Action Protocols as well as the development of early actions that need to be tailored towards the most vulnerable in these groups.

- Measuring urban vulnerability and risk requires particular accuracy to account for diversity in e.g. livelihood groups. This means for example to bear in mind the different schedules that daily wagers or street vendors are following in their daily routine, when they will be mostly unavailable at their place of residency during daytime hours.

Recommendation

Consider the differing daily schedule of the various livelihoods groups who could be affected by a hazard in order to receive the most representative picture of the communities.

- Try to engage with livelihoods groups after work hours, during breaks or visit them in their (mobile) shops, if they are not to be found at their residency.
- Try to engage with diverse livelihood groups via mobile surveys as many urban residents use cell phones
- Based on your understanding of the stakeholders in the project, make use of community organisers and multipliers - also for engaging with the varied groups within an urban area

Further, combining spatial analysis with livelihood analysis provides a more representative picture of urban vulnerability as opposed to exclusive spatial based vulnerability analysis. This city vulnerability assessment report for the Indian cities of Indore and Surat uses geographic information system (GIS) mapping, combined with a modified sustainability livelihood framework at household and community level, to capture the dynamic nature of urban areas. Remote sensing helps to capture the density and pattern of buildings as well as roof types, road width and distance from hazard-prone areas. When combined with sample community surveys, promising results are produced.

6 https://www.alnap.org/system/files/content/resource/files/main/alnap-urban-system-stakeholders-2016-web.pdf

Systems Thinking

The Resilience of urban dwellers relies upon systems which they are not always able to control. Such as transport, water, healthcare and many more.
A detailed analysis through e.g. city wide risk assessment section 'resilience of what' can serve a purpose to understand the diverse needs that inhabitants of poor urban areas have.

- Information is flowing through a diverse net of channels in densely settled areas. Also the access to weather information, including early warnings, is different in urban areas for various reasons. The greater access to phones in cities means that more people can receive early warnings through text messages or WhatsApp groups. Access to the internet, TV and radio is also generally higher in cities. It is important to note that access to radios, mobile phones and TV may be limited in informal settlements but other effective communication approaches, such as public address systems (e.g., megaphones on mobile trucks), can be used in addition to more advanced tech-based methods. It is also important to remember that various local dialects or languages could be in use within a single neighbourhood.

Density: is referring to the concentration of people and infrastructure, this is a major characteristic of cities. High density settings provide opportunities and challenges for FbF.

- Information is quickly and widely spread within a given locality by word of mouth or use of phones, which can facilitate the sharing of early warning and awareness raising messages.

- Density provides humanitarian workers with easy access to many people within a small area; this means during the often short time between the forecast and the impact of the extreme event, early actions can reach a larger number of peopleAlso, densely built areas enable easy to reach register points from which humanitarians do not need to deploy far distances to provide support.

- But highly dense informal settlements can be hard to access by trucks providing non-food humanitarian aid. Other challenges include the consequences of potential infrastructure damage following a disaster as well as the difficulties in accessing people in large buildings.

Dynamism: Cities are constantly changing in form (infrastructure developments) and function. City dwellers often change locations owing to livelihood opportunities and other factors. A disaster striking rural or urban areas will spark an influx of people into nearby cities. People such as those living in hazard-prone informal settlements may move temporarily to escape flash floods at the onset of rains, for example, before returning to their homes or moving elsewhere. This requires humanitarian actors to devise mechanisms for identification of for following up their target groups and revising early actions more frequently. Also, FbF implementers have to bear in mind that data can be outdated in a short time, making the

Forecast-based financing and city governance

The governance system and the organizational structure of a city are highly dependent upon the policies, modalities and municipal acts of the respective countries. Generally, cities are governed by their respective local governments, which usually have a political wing and an administrative or technical division. The head public representative or political executive is usually a 'Mayor' or 'Chairperson'. The head of the administrative/ technical division is often referred to as 'Commissioner', 'Chief Executive Officer' or 'Secretary', based on the legislation or municipal act of the respective country or province. A municipal corporation is typically sub-divided into several line departments such as disaster/emergency, engineering, environment health, planning and development, revenue etc. Each department has its own organizational structure and head. It is always crucial to have a good enough understanding of the governance structure of the respective city to determine how an activation can proceed successfully when a trigger is reached and what the entry points are before initiating the FbF process in a city.

Cities are not just a concentration of resources. They also host a large number of stakeholders and actors contributing to different aspects of urban disaster management. This differs from most rural settings where governance is often more devolved and dispersed across large geographical areas. The concentration of diverse actors also means that greater effort should be devoted to coordinating action. This goes into the breadth of the city as well as its different levels (e.g. of administration), which have to be included. Humanitarian organizations are encouraged to find creative ways of working with different organizations who, in some cases, have competing aspirations. Practitioners intending to introduce FbF in cities, for example, can learn from this useful GDPC guide on coalition building in cities and this GRC publication on stakeholder analysis and Network Analysis. More general information on including stakeholders in an FbF Process can be found in the FbF Practitioners Manual.

Coordination

A key challenge that the Red Cross Red Crescent and other humanitarian organizations need to overcome is the limited coordination and cooperation between cities/ municipalities and national/federal governments. Within cities, good coordination is needed to overcome the divergent interests of political and technical staff. A key principle of maintaining stakeholder relationships is to formulate a stakeholder engagement process and review it on a regular basis. The FbF Practitioners Manual is giving an excellent overview on ways and examples, of how during the set up of FbF programmes in a given country governments have been onboarded and stakeholders have been included regularly through for example the implementation of Technical Working Group meetings. Regular communication, clarity on the scope and objectives of the coordination and enabling each stakeholder to share their thoughts and concerns, are just some essentials of an effective stakeholder engagement process. Importantly, stakeholder engagement must include interactive, multidimensional information-sharing with participants contributing information and experiences and learning from their exchanges. This is especially crucial regarding the engagement of the included communities.

Participatory approaches are key to building cohesion among actors. For example, in March 2019, in the wake of Cyclone Idai, the Mozambique Red Cross Society worked closely with UN Habitat to rebuild secondary cities affected by the cyclone. UN-Habitat is championing the City Resilience Action Planning (CityRAP) tool used for training city managers and municipal technicians to plan actions aimed at reducing risk and enhancing the resilience of small to intermediate cities. Lessons learned from the CityRAP experience show that success in implementing projects in cities is realized when the municipality takes the lead from the beginning. Secondly, it is important to leverage local knowledge through participatory approaches, both in data collection and dissemination

Multi-stakeholder engagement in Dar es Salaam, Tanzania

In Dar es Salaam, the Tanzania Red Cross Society worked with 13 stakeholders including universities, the private sector and the World Bank to pilot urban FbF. Through this collaboration, disaster anticipation and response plans based on FbF principles were developed for three municipal authorities and ten wards frequently affected by floods. This urban FbF project demonstrated the extent of collaboration needed in cities. Each partner brought unique skills to the project including community engagement, forecasting and mapping. The project established the Dar es Salaam Urban Forum, co-chaired by the municipal authority. Among the key lessons learned were the need to design a clear communication strategy as well as partners' roles and responsibilities. While some partners were on board from the beginning, others were added as the project evolved. See more here.

Data accessibility for urban FbF

Vulnerability data: Given the abundance of actors, cities usually have considerable amounts of data on vulnerability, although this is generally dispersed among non-governmental organizations (NGOs), government agencies and the private sector. Coarse vulnerability data is not good enough for decision-making at the local level and is likely to discount urban vulnerability when compared to rural areas. However, collaborating with other organizations such as the Humanitarian OpenStreetMap Team (HOT) greatly improves data availability.

In some instances, data-sharing between central government and cities has been hindered by power struggles between the two. Humanitarian actors should consult with national and city governments to understand the challenges and opportunities for anticipatory actions. Regarding access to data, reaching out to the city administration – especially the departments in charge of engineering, GIS, planning or statistics – will be helpful to guide humanitarian actors on where to obtain the data they need. Questions include: are there any open datasets available? Is there an online data portal? Who is responsible for producing documentation on risk data?

Where is the city data? Accessing impact data from universities in Peru

It can be difficult to obtain data about cities in developing countries. For example, some cities report directly to civil defence the occurrence of, or an emergency caused by, a natural hazard. An alternative source of data are universities. For example, following the 2017 coastal El Niño in Peru, a local university created a dashboard where anyone can report an extreme event in the country. https://sites.google.com/utec.edu.pe/portal-desastres-sig/inicio?authuser=0

Historical disaster data: Climate scientists acknowledge that one of the critical challenges in many countries in the Global South is the unavailability of reliable data. Historical and meteorological data either does not exist, or it is not readily available. Often, procuring meteorological data is a time- and resource-intensive process. Additionally, most of the data available at the national level is coarse. In some instances, data with higher granularity is available, even at the neighbourhood level, but this is usually scattered among local NGOs and community-based organizations (CBOs).

Efforts to leverage high technology penetration in cities should be harnessed to obtain data during assessments. For example, the Tanzania Red Cross Society has collaborated with HOT to map out areas most vulnerable to flooding in Dar es Salaam. This type of open street mapping is providing opportunities to enhance data availability in urban areas. Following Cyclone Idai in 2019, disaster responders in Beira, Mozambique used drones to collect data on the extent of the damage. In Malawi, drones were also used to obtain accurate data which guided response efforts following severe flooding in 2019. This type of granular data on impacts can be very valuable during the development of EAPs. However, drones are expensive and, some reports say, cannot be operated under heavy rains. The advancements in artificial intelligence may offer alternative opportunities to analyse the extent of disaster impacts, such as counting the number of damaged houses.

Partnerships are essential to obtaining data that provides a holistic view of urban vulnerability. Anticipatory humanitarian initiatives should partner with city governments, NGOs, Red Cross and Red Crescent National Societies, private businesses and community leaders working in informal settlements. Academic institutions also have a wealth of information collected over time and, if involved in the setting up of FbF, can be very helpful sources of data. Given the overwhelming amount of and it being scattered around various actors, a mindset shift needs to take place. In order to be able to navigate urban risk and assess it with modern technology, National Societies need to build on trusted cooperation with data providers and analysts

Exploring data challenges for urban areas

A report by Concern Worldwide notes that "urban vulnerabilities are under-represented or masked in national data sets while surveillance systems are geared to rural early warning and response, often linked to cyclic drought." It continues "Even when they are included, data is rarely disaggregated between wealthier urban localities and slums, leading to a homogenization that hides the true situation in both areas."
Key lessons from two years of research by Concern Worldwide, include:

- averages mask reality for the most vulnerable in the poorest slums
- the most vulnerable tend to be clustered in 'hot spots'
- female-headed households are disproportionately poor and more concentrated in 'hot spots'
- poor households often resort to negative coping strategies, such as relying on loans for basic needs (e.g., food and rent), and withdrawing their children from school. See more here

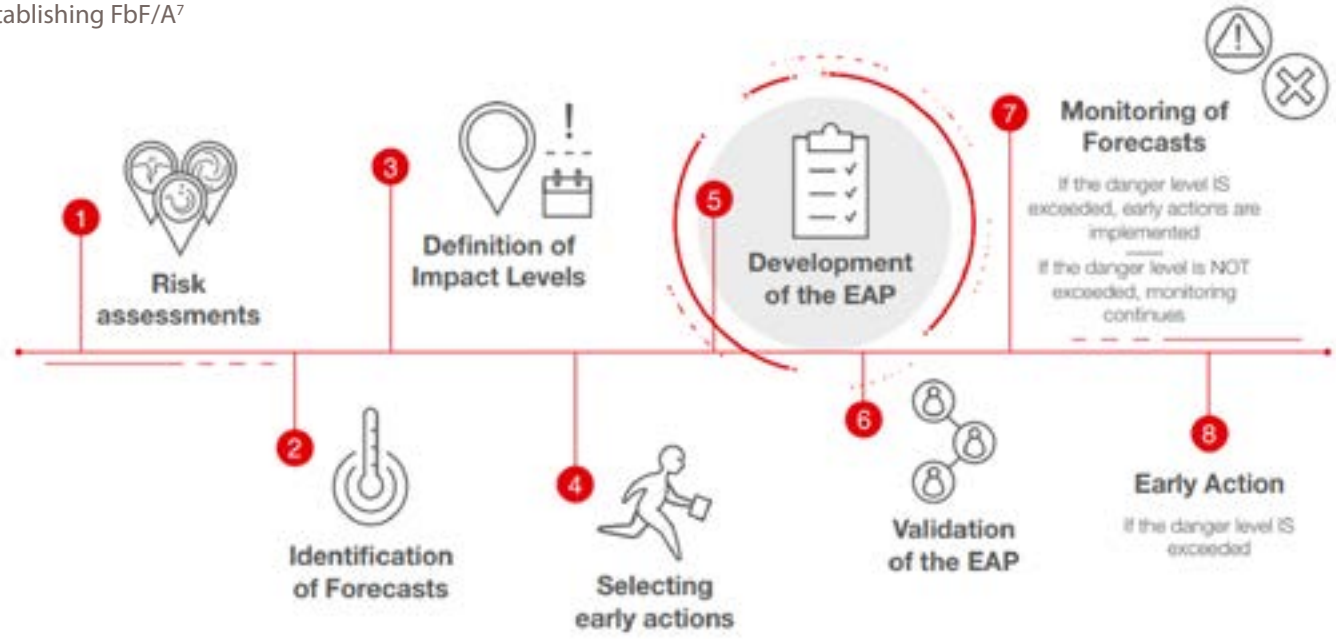
Examining the implications of the unique urban context in relation to FbF/A programme design

Introducing FbF/A: Figure 1, illustrates the steps towards introducing FbF/A. This is followed by explanatory text on why and how urban FbF may be different to non-urban FbF

1. Risk assessments: Who is vulnerable to this hazard and where are they located? What were the impacts caused by these hazards in the past? This part of the FbF methodology is about analysing data related to hazards (particular past impacts), exposure, vulnerability, and coping capacity.

Urban vulnerability can remain largely hidden if coarse data is used to understand the weather/climate risks affecting a large geographical area. Earth observation for example can provide good information about changing land use, including the rapid changes that can help practitioners to locate informal settlements that have been developed recently.

Figure 1. Steps for establishing FbF/A[7]



These changes allow to estimate the number of people, buildings and settlements that are exposed to a given hazard as well as how long the settlements have been there[8]. However, in FbF earth observations must always be supplemented with primary and secondary data collection to understand inherent vulnerabilities. Urban vulnerability is greatly amplified by limited access to livelihoods and income (e.g. through a strong dependency on supply chains). Urban livelihoods are strongly linked to the cash-based economy. This means less access to cash limits peoples' access to basic services. Access to income and savings should therefore be considered in vulnerability analyses. Risk accumulation resulting from small-scale weather events can cause significant suffering to the urban poor leading to 'everyday disasters'. These recurrent small-scale events deprive poor households of their scarce financial resources and increase their vulnerability to the adverse impacts of an extreme event.

7 https://www.forecast-based-financing.org/wp-content/uploads/2019/01/2_Update2_UrbanFbF.pdf

8 Friedrich, H.K. and Van Den Hoek, J., 2020. 'Breaking ground: Automated disturbance detection with Landsat time series captures rapid refugee settlement establishment and growth in North Uganda'. Computers, Environment and Urban Systems, 82, p.101499.

When conducting risk analyses, urban areas should be given special attention to account for key factors such as population density, gradients of climate risk and the availability of resources. Less green areas and more gray (paved and sealed) surfaces amplify the exposure of urban dwellers to heat and flash floods.[9] It is recommended that special consideration is given to weighting urban risk differently also in comparison to rural risk, to avoid skewing the assessment due to e.g. incomparable data sets.[10]

9 Zeleňáková, M., Purcz, P., Hlavatá, H. and Blišťan, P., 2015. 'Climate change in urban versus rural areas'. Procedia Engineering, 119, pp.1171–1180.

10 Christenson, E., Elliott, M., Banerjee, O., Hamrick, L. and Bartram, J., 2014. 'Climate-related hazards: A method for global assessment of urban and rural population exposure to cyclones, droughts, and floods'. International journal of environmental research and public health, 11(2), pp.2169–2192.

Urban risks are a combination of

1.) rapid & unplanned urbanisation in hazardous areas (steep hills, slums, coastal informal settlements), leaving no other choice for most vulnerable to settle in hazardous areas -> intersectoral risks (physical and social risks related to poverty)

2.) chronic risks: public service providers struggle with rapid urbanisation and thus, no proper service provision (water & sewage, electricity, health care, education, waste management, public transport) + lacking HLP rights and absence of tenure security

3.) spatial urban risks: poor construction, lack of building codes, lack open space for evacuation, informal settlement, density etc.

2. Identification of forecasts: Predicting how a weather event driven by global factors will materialize at a smaller scale that is highly diversified, such as a city locality, requires powerful equipment (an extensive network of weather stations and powerful computing capacity). High resolution (spatial) weather forecasting models are needed to capture the local-scale processes that occur in urban areas. Alternatively, statistical downscaling to bias-correct the coarser-scale models for finer resolution can be employed if forecasts are unavailable at the high resolution needed. Therefore, it is imperative that current models forecasting the weather for cities are supplemented with impact data from the ground, especially where forecasting capability is reduced. Practitioners should reach out to universities and local hydrometeorological institutions for more information.

Lessons from Nairobi and Kampala on urban weather forecasting

In Nairobi, the Kenya Meteorological Department has identified models that help to predict urban flooding within a two-week window. In Kampala, meanwhile, the Future Climate for Africa consortium installed urban weather stations in Uganda's capital to monitor localized intensive rainfall often missed by national weather stations located outside the city.

3. Defining impact levels: Experience so far indicates that implementers of urban FbF/A need a good database of information on the impact of past events. Such information is often scarce and, where it exists, is often scattered in different city departments and/or among different stakeholders. Therefore, efforts should be made to collate this information and make it available to impact modellers and other users. Given the before mentioned high diversity in cities, triggers must be designed in a way that allows to combine the forecasts with the vulnerability and exposure data not for the entire town but for individual areas.

Monitoring forecasts with the intention of triggering early action requires different knowledge in different contexts. In an urban context, given the density of people, infrastructure and livelihoods, it is important to be aware of the gradients of climate and weather variables across the given area of interest. In a rural area,10 square kilometres may contain 50–100 people, whereas in an urban setting this could rise to 10–100 thousand people or more. Furthermore, the observational network of climate variables, such as rainfall, may be denser in urban areas, yet the differences in these climate variables over relatively small areas will be uncertain to some degree. While it is not fair to say that differences in rural areas are less important, the differences in urban areas will be more impactful in terms of the number of people affected, for example, when comparing the de-prioritization of action in one neighbourhood to another. To understand these local scale differences in climate risk, priority should be given to speaking with both national meteorological services, city government and local community groups active in the informal areas of a city. [11]

4. Selecting early actions: Selecting effective early actions will largely depend on adequate consultations with stakeholders, including community members and disaster managers.

Early action protocols should propose actions that are relevant for urban and rural areas. For example, if a typhoon is expected to hit a rural area, early harvesting might be recommended. On the other hand, if a typhoon is expected to hit an urban area, clearing drains and/or preparing businesses for the impacts could be recommend. For urban areas, experts have recommended selecting actions that are beneficial at the neighbourhood level, rather than household level. However, some circumstances may demand action at the household level. Given that the urban economy is predominantly cash-based, exploring cash transfers as an early action is important. The widespread use of phones and mobile phone banking makes the cash transfer option very feasible.

11 Douglass, M., 2016. 'The urban transition of disaster governance in Asia'. In: Disaster governance in urbanizing Asia (pp. 13–43). Springer, Singapore.

Experience from Butuan City, the Philippines

A case example of a simulation of evacuation of small vendor's shops in Butuan City, the Philippines, shows diverse and dynamic cities can be and the resulting need to act quickly and validate the targeted shop as possible. As the market is fluid and many businesses, open, close or relocate, relatively new data on the already be outdated. Make use of the volunteers in your National Society and make sure to have the community ready and validated, even more so in fast-changing urban areas. bilities. While some partners were on board beginning, others were added as the project evolved. See more here.

Targeting outdoor workers in Hanoi, Viet Nam

Under its flagship urban FbF project, the Viet Nam Red Cross Society (VRCS) tested early actions targeting street vendors and motorcycle couriers in Hanoi. VRCS set up cooling centres – some stationary, others mobile (buses) – where outdoor workers were given drinking water and a wet towel to cool off during periods of extreme heat. They also received advice on how to avoid the possible health impacts of a heatwave. See more here.

5. Beneficiaries selection: Identifying beneficiaries in urban contexts needs an expanded view of the community.

Livelihoods are a definite marker of vulnerability in cities. The definition of a community should be expanded to incorporate social networks and communities of interest. For example, in Kampala, Uganda, informal settlements are often regarded as transitional areas as their inhabitants are highly mobile. Some inhabitants move to other parts of the city, or elsewhere, to avoid flooding just before the rainy season begins. A majority rent their homes from owners who live elsewhere in safer places. This can impact targeting. For example, should cash transfers go to the owners or tenants or both? And, if so, in what proportions? Understanding such dynamics requires interaction with community leaders as well as key informants. Census data is very helpful in providing an overview, but it should be supplemented with other data sources because it becomes outdated very quickly due to the rapid changes occurring in urban settings. Partnerships with neighbourhood associations, CBOs, local youth clubs/groups, religious centres and informal workers' associations etc. can help to identify beneficiaries. Ground truthing or auditing is another effective tool in selecting beneficiaries.

Developing heatwave triggers for Dhaka, Bangladesh

Dhaka is home to more than 21 million people over an area of 1,500 square kilometres. Due to its geographic location, land use characteristics such as unplanned urbanization with low green coverage, poor ventilation, poverty, and the pre-monsoon climate Dhaka City is highly exposed to heatwaves. Hot weather or heatwaves show an increasing trend of prevalence in recent years with high impacts on lives, livelihoods (e.g. loss in the number of workdays or hours, particularly for those who work outdoors), and the health of the poor and vulnerable population, especially elderly, pregnant and lactating women (PLW), children, people with disabilities, slum dwellers, people who live in tin sheds or temporary houses on the roadside without a false/dropped ceiling and outdoor workers like rickshaw/van pullers, hawkers/street vendors and day-laborers.

The Bangladesh Red Crescent Society with support from the German Red Cross developed an Early Action Protocol (EAP) with anticipatory actions aimed at reducing the impacts of heatwaves on the most vulnerable. In doing so, the project team faced various challenges including: the limited availability of historical data on heat impacts; identifying and targeting the most vulnerable and highly mobile outdoor workers; and prioritizing wards with dynamic, exposed populations. To overcome the data challenges, the team resorted to text mining from news articles in addition to primary data collection to ascertain the impacts of heatwaves in the city. In addition, the team used proxies such as increased hospitalization to show the impacts on health.

If the temperature is forecasted for 38°C and the heat index is 38 for two or more consecutive days the following early actions are being triggered: 1) Awareness generation and dissemination of early warning, 2) Distribution of water & saline, 3) Multi-purpose cash grant to most vulnerable households, 4) Provision of cooling stations, 5) Ambulance support for referral cases.

6. Monitoring forecasts and triggering early action:

In Nairobi, the Kenya Meteorological Department helped stakeholders to better understand probabilistic forecasts, including the percentage of false alarms. This process helped partners to make well-informed decisions on what actions should be taken and when (note: the cost of the action has to be proportional to the level of confidence).

The Kenya Meteorology Agency uses radio stations, print and online media to pass on hazard warnings to the wider population. Various social media platforms including WhatsApp, Facebook and Twitter have also been used to widely disseminate early warnings at the beginning of the rainy season with communication intensified as the season progresses. However, the widespread distribution of early warning messages via media relations is a complex and sensitive matter. Often, the actual messages or information is misinterpreted due to a lack of coordination and communication between city officials, the meteorological office and media personnel. Information gaps or wrongly presented information can invite political trouble. Consequently, it is important for a city authority to produce a comprehensive media advisory for effective communication regarding forecast, triggering and action. The media advisory will help to illustrate what information needs to be provided to whom, where, how and when in a regulated manner. Further, enabling the community centres to relay communication decentral may provide crucial when single or multiple forms of communication are disrupted.

Communicating early warning to informal settlements in Nairobi, Kenya

DARAJA (Developing Risk Awareness through Joint Action) is a project under the Weather and Climate Information Services for Africa (WISER) East Africa programme. The project was implemented by Resurgence, local meteorological agencies and other in-country partners. DARAJA aims to improve the access to, and use of weather and climate information by residents of informal settlements in Nairobi, Kenya as well as in Dar es Salaam, Tanzania.

The results of a baseline survey indicate that weather forecasts should be easy to understand and downscaled to settlement level, provide information on the expected impact of the weather on the local area, and contain actions that local people can take to reduce the anticipated impacts.

Insights on communicating climate and weather information to urban dwellers include:

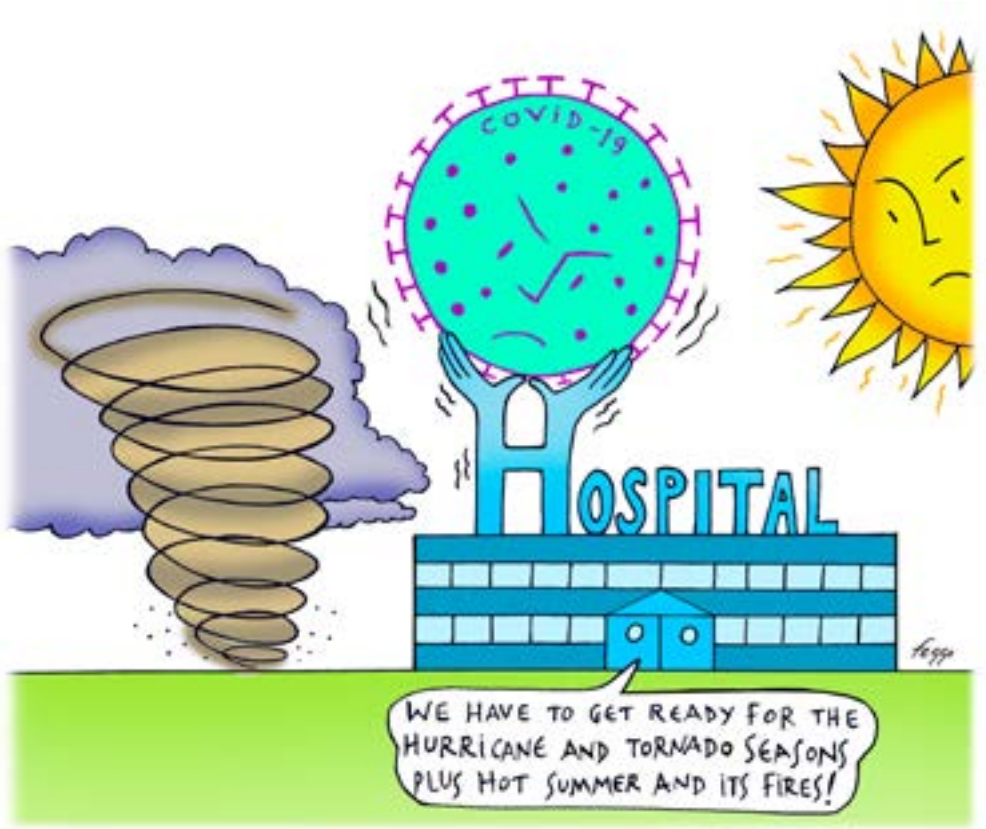
Radio and social media campaigns increase understanding of weather and climate information and, subsequently, prompt forecast-based action at local level. The project co-designed videos with local people as well as experts from the informal settlements. Popular posts on social media included videos on interpretating weather forecasts and a livestream of community clean ups as well as warnings of extreme weather.

At settlement level, community radio, text messaging and WhatsApp groups were found to be useful channels for sharing climate and weather information. These were supplemented with flyers and a public address system moving around the settlement.

At city level, awareness videos on the following topics proved to be the most successful: weather information for business planning; expected rainfall; electricity outages and fire outbreaks. Videos explaining probabilistic forecasting were shared on Twitter, Facebook, Instagram, YouTube and WhatsApp.

Early action: These activities involved the community in clearing drainage channels to ensure stormwater could flow smoothly when the rains came. In addition, community members petitioned city officials to step up the collection of refuse.

Conclusion



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The insights provided in this guidance note suggest entry points for modifications in the FbF methodology. Practically, this means understanding urban systems better, their risks, dynamics, diversity and density and how anticipation can play a role in it.

In the future it is important to compare different urban areas to each other and project successes instead of comparing urban to rural settings, which is likely to mask the vulnerabilities inherent to urban contexts.

Cities present unique opportunities for forecast-based action – potentially the ability to help more people and engage with a variety of stakeholders while yielding tremendous learning opportunities. It also seems inevitable that anticipatory action will become integral to disaster risk reduction strategies in cities in the future. Consequently, the moment is right to discuss this topic in depth.

Make use of further anticipation hub resources and possibilities to engage, to learn and share your experiences on application of FbF in urban areas on the Anticipation Hub.

Climate Centre

German Red Cross