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Australian Government
Department of Foreign Affairs and Trade

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AASCTF POLICY BRIEF

Policy and Practice Recommendations : Towards a Gender Transformative Flood Early Warning System in Baguio City

SUMMARY

- This policy brief provides targeted policy and practice recommendations for the **Flood Early Warning System**, in Baguio City, Western Philippines.
- Building on the findings of the *Baguio City Gender and Inclusion Study*, these recommendations will ensure that the flood early warning system integrates Gender Transformative approaches, providing a system that **works effectively for all**, with **no-one left behind**.
- Part one of this document provides a brief **Background** to this initiative on Gender Transformative Early Warning.
- Part two summarises the **Key Findings** of the Mixed Methods Gender and Inclusion Study.
- Part three provides **Recommendations** for the design and operation of Baguio's Flood Early Warning System.
- The final section describes the next steps in moving from **Recommendations into Actions**.
- This policy brief is recommended reading for stakeholders engaged in implementing different components of the Baguio Flood Early Warning System, with wider relevance for those wishing to learn from Baguio's investment in **Gender Transformative Flood Early Warning**.

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Part 1: Background and Introduction

Baguio city, in the Western Philippines, is part of the ASEAN Australia Smart Cities Trust Fund (AASCTF) programme. This programme, supported by the ADB, aims to build liveable, resilient, and inclusive cities across South-East Asia, while in the process identifying scalable best and next practices to be replicated across cities in Asia and the Pacific. Within this initiative, Baguio is aspiring to become an exemplar of effective Flood Early Warning.

The Smart Flood Early Warning, Information and Mitigation System project under the AASCTF is assisting the city with both the planning for flood mitigation and the delivery of the services of flood early warning and responses, using smart technologies. The intended outcome is improved flood early warning system (FEWS), responses, and mitigation measures in Baguio. As a complement to this, the *Gender Transformative Approach for Strengthened Development, Application, and Replication of the Baguio City Smart Flood Early Warning* project is being implemented specifically to ensure appropriate, applicable, and timely early warning reaches the last mile, including the most vulnerable, recognizing that effective FEWS are people-centric.

Effective early warning systems (EWS) are people centred, ensuring appropriate early warning reaches the last mile, including the most vulnerable. An effective and sustainable EWS considers and is designed to meet the needs, capacities, constraints, and priorities of all people, enabling appropriate and timely early action to save lives and reduce losses. We know that women and marginalized groups including gender minorities are often excluded from disaster

risk reduction policies, strategies, and decision-making due to unequal power relations, gender norms, and gendered socioeconomic inequality. In many locations, early warning messages are less likely to reach marginalised women and other marginalized groups, directly impacting their chance of survival. Baguio city aspires to a Gender Transformative Flood Early Warning System, in a city and system that protects all, where no-one is left behind.

Within this aspiration, [Ramboll](#) and [Practical Action Consulting](#) collaborated on a [Gender and Inclusion Study](#). This study deepened understanding and analysis of the relevance of gender and inequality to flood risk and flood early warning in Baguio city. It examined evidence of gender and inequality influencing people's experiences of flood risk and early warning.

The study took an intersectional approach, recognising the diverse and varied experiences of different people. Separating populations solely by gender does not fully account for an individual's experience in disaster contexts. Compounding factors and multiple vulnerabilities can combine to increase an individual's vulnerability exponentially. An intersectional approach therefore needs to be taken to understand the complexity of factors affecting the impact of a disaster on an individual.

The Gender and Inclusion Study was the first output contributing towards the development of a Gender Transformative Flood Early Warning System. This accompanying Policy Brief takes the study's conclusions a step farther, outlining a series of practical and policy recommendations building upon the key findings of the study.¹



Source: Asian Development Bank

¹ This document is considered to meet the requirements for D3a: Policy Brief: Recommendations and Guidance into FEW Design; and D4a: Policy Brief: Recommendations and Guidance into FEWS Dissemination, which are presented here in one cohesive document, rather than separately.

Part 2: Key Findings

In terms of **vulnerability and impact**, caring responsibilities were a key driver of vulnerability, with single parents particularly struggling to safely evacuate with children and with essential supplies. Existing support targeted those with long-standing physical disabilities, without sufficient flexibility to target additional support to those with short-term capacity challenges. There were also concerns on the potential for extremely marginalised groups such as homeless people to be left without sufficient support. The current system relies strongly upon informal social connections, potentially increasing the vulnerability of those who are disconnected from or distrustful of local authorities.

City-wide **risk knowledge** practices and activities, such as risk mapping, need to take account of changing population dynamics, changing exposure, and changing flood risk patterns. At an individual level, knowledge gaps in understanding of weather forecasts and flood risk led to poor decision-making and risky late evacuation. Experience-informed action was highlighted as critical for many respondents,

highlighting the importance of sharing insights with new arrivals to Baguio, and maintaining experience-based insights in areas that are infrequently flooded. The research highlighted clear links between a lack of risk knowledge and poorer decision-making, preparedness and flood response, so efforts to enhance risk knowledge should be a priority within the Baguio FEWS.

With regard to **monitoring and warning**, the current one-size-fits-all early warning lead time was not effective for all, with differing needs and preferences for early warning. There is also a need to distinguish more clearly between generic weather forecasts, preparedness warnings and instructions for evacuation, with more emphasis on preparedness warnings. Early warning lead times, and thresholds and triggers within the Baguio FEWS, need to be co-designed by those who understand the physical and meteorological hazard, and those who understand social aspects including the actions to be taken. This co-production needs to occur at the design stage, and there also need to be feedback loops and consultations with stakeholders at regular intervals, ensuring the early warning system triggers and thresholds meet user needs.



Source: Asian Development Bank

As to **dissemination and communication**, current warnings are not reaching everyone, with many individuals first being aware of flooding when the water entered their home. In terms of information needs, priorities included knowledge on how severe a flood might be, where a flood would occur and when a flood would occur. This information is more detailed than a simplistic “evacuate” or “don’t evacuate” instruction. Those designing early warning messaging can consider how to effectively communicate these three pieces of information, enabling people to make risk-informed decisions.

In terms of **preparedness**, individuals need to know the activities they can take ahead of time to reduce their risk and ensure a safer evacuation. Key informants reported individuals asking about evacuation routes and evacuation facilities at the point of evacuation, and several respondents found their chosen evacuation routes unsafe or precarious, highlighting the ineffectiveness of preparedness planning or practice. Preparedness planning can help individuals plan their key actions, the sequence and timing of preparedness actions, as well as planning in advance how they will get themselves, their critical supplies, and their dependents safely to a temporary shelter.

A number of issues contributed towards challenges in **evacuation**. People were taking a decision to evacuate too late, related to poor understanding of risk, resulting in dangerous evacuations. People, and especially single parents, were evacuating twice, with the second evacuation occurring under unsafe circumstances due to the challenges of evacuating with children and with critical supplies. Some interviewees had wanted to evacuate earlier, but found officials did not want to open evacuation centres until flooding was in progress. Individual incentives and motivations need to inform the design of an evacuation strategy, understanding the reasons why some individuals may be disinclined to early evacuation.

Respondents noted a number of challenges to existing **evacuation facilities**, mentioning inadequate water, sanitation and hygiene (WASH) facilities, challenges related to overcrowding, privacy and safety, and concerns about keeping children safe and supervised at communal evacuation facilities. In a number of cases interviewees drew on existing social connections to find more suitable alternative arrangements, raising a concern about the coping mechanisms of vulnerable individuals or families who are in a similar situation, but without social connections or extended family to draw upon. A lack of comfort, warmth, and cooking essentials in evacuation centres incentivised people to return to their houses to fetch blankets, mattresses or cooking supplies during high-risk flood periods, highlighting a need for greater preparedness planning.

In terms of **post-event relief**, concerns were raised about the method of identifying affected or vulnerable individuals. Others focused on the potential for flood impact exacerbating marginalisation, with suggestions for greater support for the most poor, marginalised or vulnerable to enable **longer-term recovery**.

There were also **governance** gaps in terms of feedback loops, accountability processes and opportunities for community engagement within the system. Roles, responsibilities and capacities across the EWS could also be clearer, especially in terms of public education on preparedness, on practicing for response, and on building risk knowledge. Within an early warning system that aspires to leave no one behind, there need to be proactive mechanisms for listening to the experiences of those at the margins, rather than just aiming to understand the average level of satisfaction in the current system. Co-design between the users, producers and communicators of early warning is also a critical aspect of a **people centred EWS**, ensuring more people take effective early action, reducing risk, saving lives and resources, and reducing flood related impacts.



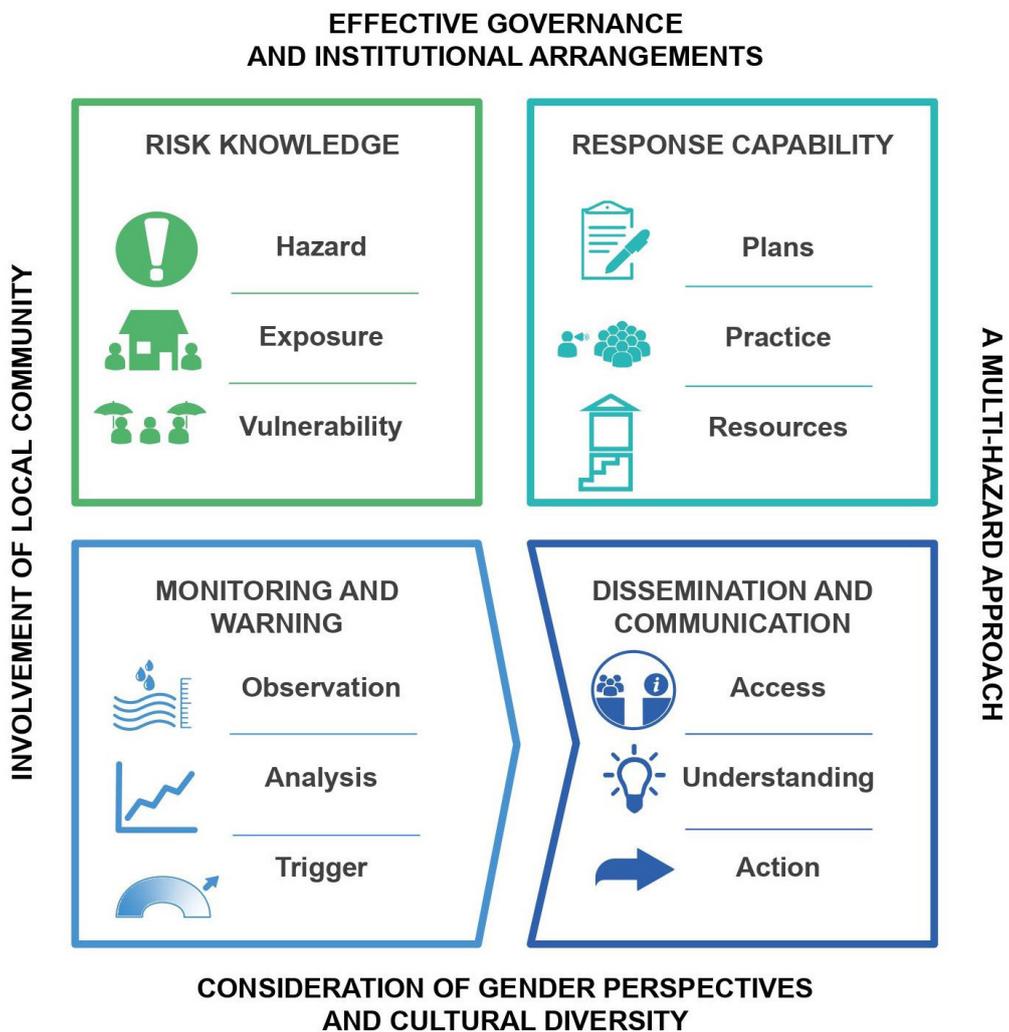
Source: Asian Development Bank

Part 3: Policy and Practice Recommendations

The findings of the study highlight a number of ways in which stakeholders involved in the design and implementation of the flood early warning system in Baguio City can take action to ensure that the EWS is effective for everyone who needs it, leaves no one behind, and supports equitable and inclusive

risk reduction and resilience. This section highlights key recommendations for each component of a holistic, people-centred EWS based on the findings of this study (see Figure 1 for an overview of the key components of a people-centred EWS).

Figure 1: Elements of an effective early warning system



Source: Practical Action, 2020, adapted from World Meteorological Organisation, 2017.

1

Gender and Inequality Informed EWS

- **Raise awareness** about the importance of **specific and targeted action** to reach an ambition of “no-one left behind”, especially with those in key positions in the design and management of the EWS.
- Within ongoing **data collection activities, consider how to learn from minority experiences**, including from those with multiple axes of marginalisation. This can include assessment and improvement of existing tools, a review to take stock of groups omitted from existing data collection approaches, and enhancement of the data collection system to hear from those otherwise excluded, including the incorporation of **robust qualitative data alongside enhanced quantitative data**.
- Develop **multiple options for safe and appropriate feedback loops** to listen to and be held accountable to those with minority experiences or poor trust in authorities.
- Ensure that **listening to minority as well as average experiences** is built into post flood After Action Reviews.

2

Improve Understanding of Risk

- **Explore and develop** ways to make **experience-based knowledge accessible** to broader populations, including information on **lessons learnt from past floods**.
- **Build understanding of flood risk** through public communication and education. This can include building awareness of how weather and rainfall translate to flood risk and ensuring early warning translates weather events directly into communications about flooding, **making clear the likely difference between rainfall intensity and flood risk** especially in lower lying catchments or areas with poor drainage.
- **Build understanding of the early warning system**, sources of information, meaning of messages, potential actions, and preparedness activities through **public communication and education**.
- Ensure that **responsibilities for public education** on risk and early warning are **clearly defined** and have **sufficient resources** (including time, funding and suitable information products) to be effective.

3

Preparedness for Safe Evacuation

- Support people to understand the **no/low-regret options** they can take early, and to be encouraged to take these steps outside of an emergency window (for example preparing an evacuation bag).
- Ensure people **understand where they can evacuate to**, and that people know their **safest evacuation route** (with consideration of what their evacuation route will be like under different rainfall or flood conditions).
- **Support and encourage people to plan, prepare and practice evacuation** – individuals need to know where they will go, what they will take, when they will leave, what they will do if they encounter an unexpected problem etc.
- Individuals with **evacuation support needs** should be treated with **dignity and autonomy**, two considerations that need to be built into emergency management planning. For example, some individuals with additional needs may want to be the first evacuated, whereas others for whom long stays in basic emergency shelters are least comfortable or tolerable may prefer later evacuation.
- Ensure there are **clear preparedness plans for supporting socially marginalised groups** with additional needs who are at risk of being left behind without targeted support and resources (e.g. people who are homeless).

4 Development of Forecasts, Alerts and Warnings

- The system needs to **distinguish between flood forecasts** (forecasts of what the flood will be, e.g. where and when), **impact-based flood forecasts** (forecasts of what the flood will do), preparedness alerts and evacuation instructions. The system needs to be clear which of these are prioritised.
- Provide forecast **information that suits people's needs**, including information on where floods will occur, how severe they will be, what is the safe window for pre-flood evacuation. The system needs to decide how to meet these information needs.
- Decide whether the system can immediately (or in the medium term) **provide multiple lead times**, providing earlier warnings to those who need additional time to respond safely.

5 Dissemination (of forecasts, alerts and evacuation instructions)

- Ensure there is a **robust dissemination strategy** detailing who will share forecasts, alerts and evacuation instructions and how they will be shared (in person, radio, SMS etc.).
- **Encourage redundancies** in the dissemination system – multiple simultaneous dissemination channels are critical, ensuring no one is left behind and ensuring the system is not left vulnerable if a main dissemination channel fails.
- **Build on existing formal and informal dissemination channels**, such as in-person alerts or guidance to evacuate, particularly from community leaders, whilst also building alternative channels of dissemination, and trust in these channels.
- Recognize that there will be individuals **who do not want in-person, authority-led or police-led dissemination**, particularly stigmatized groups or those with low trust in authorities. Trust in sources of information is a barrier to accessing and acting on information, particularly stigmatized groups.
 - » Further **outreach via trusted intermediaries** can help understand the suitability of community leader-led dissemination for stigmatized minorities.
- Recognize that in-person, community leader-led dissemination draws upon existing social connections, with those who are excluded or who have limited social connections at risk of being the last to hear (or being left out completely). Ensure that alongside in-person dissemination there are **alternative channels**, particularly for **those with few local connections or low social capital**.
 - » Conduct additional research and outreach on the dissemination needs of groups who were not included in this study, particularly **newly-arrived students** and **migrant workers**.
- In-person, community leader-led dissemination may be suited for distributing simple uniform instructions (i.e. evacuate now). It may be less suited to sharing more complex information or earlier alerts – consider which dissemination channels are best suited for which type of communication, with **multiple dissemination channels aligned to different communications** enabling the development and evolution of a **sophisticated, people-centred early warning system** that leaves no-one behind.

6 Communication (of forecasts, alerts and evacuation instructions)

- **Develop Standard Operating Procedures for EWS communications**, agreeing in advance how information will be phrased, how probability will be described, how weather and flood risk will be conveyed, what language, visuals and terminology will be used.
- **Pre-test the language and content** of these communications with **majority audiences** to establish how well the information is understood, and how well it meets people's information needs.
- **Pre-test the language and content** of these communications with **marginalised individuals** including those at risk of being disadvantaged (for example those with linguistic, educational, literacy, disability related barriers to understanding majority targeted content).
- **Develop multiple communication content types** to increase effectiveness of information being understood, and specifically tailor content to address the needs of marginalised individuals (e.g. audio options for people with visual impairments).

7 Person-centred Evacuation

- Identify individuals or groups whose **evacuation timelines¹ differ** from the majority².
- Stakeholders in the EWS need to **understand the priorities, challenges and motivations that influence evacuation timelines**. This understanding will come from **active listening** to diverse and minority perspectives.
- When discussing **thresholds to trigger alerts or evacuations**, consider the evacuation timelines that suit the majority, as well as evacuation timelines that suit those outside of the majority.
- When deciding on a **preferred lead time**, recognize that one standard evacuation timeline will not be optimal for all individuals.
- For groups or individuals poorly served by the majority evacuation timeline, **co-develop bespoke solutions**, shaped and determined by people in that situation.
- Actions can be taken to **reduce the risks** of activities highlighted in the Gender Inclusion Study including **double evacuations**. This can target either reducing the need for return trips, or increasing the lead time so that return trips can be made before the risk reaches dangerous levels, depending on what is contextually appropriate. **Provide clearer information on evacuation sequencing and key windows for receiving help** so that people can take **informed decisions**.

8 Safety and Dignity in Temporary Shelter

- Consider and address the **barriers to using evacuation centres**, especially where individuals have had **negative past experiences** of evacuation centres not meeting marginalised individuals' needs in terms of access, comfort, hygiene, safety or ease of safeguarding children.
- Understand the **well-documented inequalities of experience in centralized shelters** and the reasons why vulnerable groups may need to consider **alternative arrangements**.
- An Early Warning System that recognizes **vulnerable people as individuals** rather than uniform groups emphasizes respect for safety, dignity and autonomy.

¹ The actions that people will take during an evacuation period, the sequencing of actions and the amount of time they require to complete these actions.

² For example single parents who cannot evacuate with children and critical supplies at the same time meaning they end up evacuating twice; or those in extreme poverty for whom a day's lost income is a significant and immediate risk, who end up evacuating late.

Next Steps: Process for Moving from Recommendations into Actions

The policy recommendations above will be shared with stakeholders in the Baguio FEWS, including government and civil society actors, and the AASCTF associated *Smart Flood Early Warning, Information and Mitigation System* project.

The Project team will facilitate a series of bilateral discussions with these stakeholders, discussing the relevance of the above recommendations for each person's organization, remit and responsibilities.

Within these bilateral conversations, the Project team will seek to co-develop priorities for how these recommendations can be effectively put into action as part of the *Smart Flood Early Warning, Information and Mitigation System* under development.

This process of co-development, discussion and refinement of agreed actions, is intended to lay a foundation for ongoing enhancement and adaptation of the FEWS, a system that is inherently adaptive and evolving.

These co-designed proposed actions ¹ will be collated into:

- **An implementation plan: Actions and responsibilities for a gender inclusive FEWS in Baguio City** - this document will be a working document and a key input into the overarching *Smart Flood Early Warning, Information and Mitigation System* project, to be used and adapted by stakeholders within the Baguio FEWS as it progresses over time, eventually becoming integrated into future FEWS SOPs so that the gender and inclusion elements are ingrained within the Flood Early Warning System.
- **A guidance document: From Recommendations to Actions: Putting gender transformative policy into practice** - this will be a short external brief describing how Baguio city has moved from policy recommendations into practical actions to deliver a Gender Transformative Flood Early Warning System. The intent of this document will be for wider dissemination among AASCTF participating cities, showcasing best practices within the region using Baguio as a case study.



Source: Asian Development Bank

¹ It is noted that the deliverables discussed below were previously referred to as "Standard Operating Procedures"(SOPs), however the decision has been made to more appropriately refer to them as "actions" that will serve as key inputs into eventual SOPs as part of the FEWS.

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About the ASEAN Australia Smart Cities Trust Fund

The ASEAN Australia Smart Cities Trust Fund (AASCTF) assists ASEAN cities in enhancing their planning systems, service delivery, and financial management by developing and testing appropriate digital solutions and systems. Digital solutions address vital cross-cutting themes such as social inclusiveness, gender equity & women's empowerment, climate change & environmental sustainability, and public-private partnerships. By working with cities, AASCTF facilitates their transformation to become more livable, resilient, and inclusive, while in the process identifying scalable best practices to be replicated across cities in Asia and the Pacific.

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