

# Empowering vulnerable communities in Gilgit-Baltistan through Community Based Flood Early Warning Systems

## Introduction

Gilgit-Baltistan (GB) is home to 12 of the world's 30 tallest mountain peaks, including K2 and Nanga Parbat. Near these peaks live some of the most vulnerable mountain communities.

When small rivers and tributaries flood, their impacts on vulnerable communities are disastrous. Mitigating flood risk is therefore a much-needed intervention for disaster management.

## Why CBFWS?

The Community Based Flood Early Warning System helps reduce community vulnerability and strengthens capacity. For the GB region, this goes hand in hand with better management of water for agriculture and improved management of water-induced hazards.

As part of its Indus Basin Initiative, the International Centre for Integrated Mountain Development (ICIMOD)

Approximately 46% of the population in the 250 villages surveyed by ICIMOD is at risk from natural disasters – including earthquakes, flash floods, and glacial lake outburst floods.

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has worked to increase the adaptive capacities of five vulnerable villages in the region through a special project – Agricultural Water, Energy and Hazard Management in the Upper Indus Basin for Improved Livelihood and Building Resilience.

The project is supported by the Government of Australia through the Sustainable Development Investment Portfolio. It is being implemented with partners World Wide Fund for Nature-Pakistan, the Gilgit Baltistan Disaster Management Authority, and the Aga Khan Planning and Building Services, Pakistan (previously known as Focus Humanitarian Assistance).



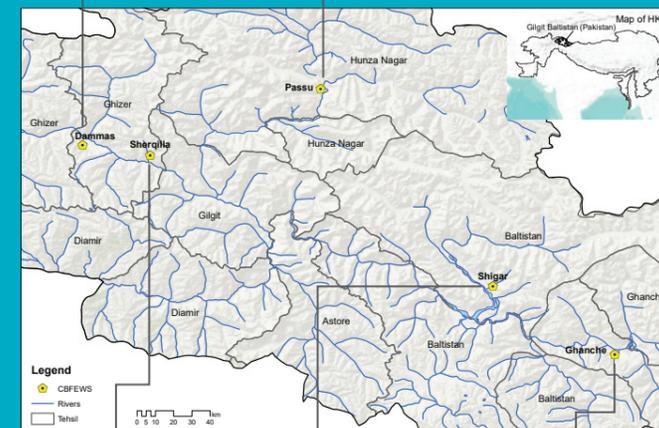
## Community Based Flood Early Warning System locations

### Dammas

Elevation: 1830-2130 masl  
Vulnerable households: 97% of 650 HHs

### Passu

Elevation: 2440-2590 masl  
Vulnerable households: 28% of 115 HHs



### Sherqilla

Elevation: 1680-1980 masl  
Vulnerable households: 88% out of 800 HHs

### Shigar

Elevation: 2290-2440 masl  
Vulnerable households: 5% of 800 HHs

### Ghanche

Elevation: 2440-2740 masl  
Vulnerable households: 56% of 2500 HHs

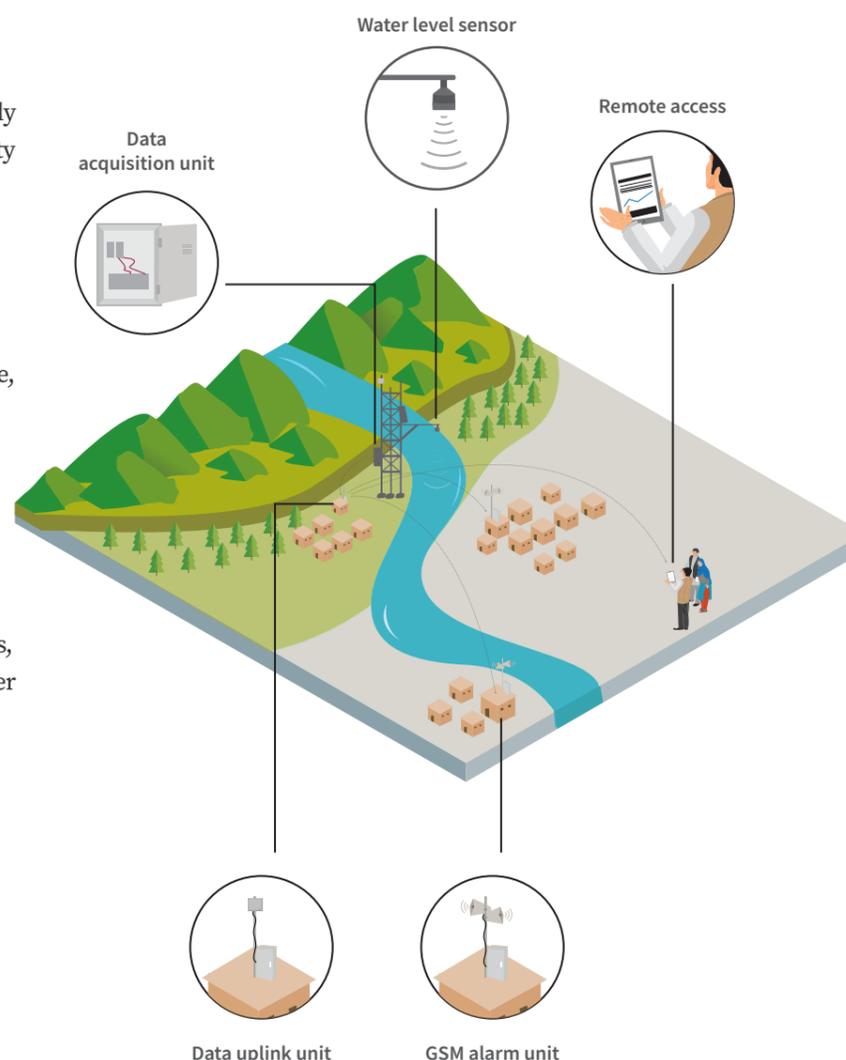
## What is CBFEWS?

CBFEWS is an integrated system of tools and plans to detect and respond to flood emergencies that is managed by communities. The people-centric CBFEWS developed by ICIMOD emphasizes the four essential elements of early warning systems: risk knowledge and scoping, community based monitoring and early warning, dissemination and communication, and response capability and resilience. Although the detection of flood risk and its communication to vulnerable communities is driven by technology, the core of the CBFEWS lies in how well the communities are prepared to respond to floods. Therefore, community preparedness is an integral part of the system.

## How does CBFEWS work?

Communities are trained to monitor flood warnings through a simple device installed upstream of a flood-prone river. The station measures rainfall and water levels, and senses the presence of water beyond the normal water channel, communicating this data through the internet.

The CBFEWS instrument is capable of generating alerts via a siren. As the water level rises in the stream, an early warning is generated at the caretaker's house, who then relays the warning to downstream communities through pre-established communication channels to enable individuals, communities, and organizations vulnerable due to flood hazards to prepare and take action to reduce harm or loss of lives and property.



“With the success of the piloted system, the Government of Gilgit-Baltistan is working towards upscaling CBFEWS in other disaster-prone areas of the province. These systems are the first of their kind in Gilgit-Baltistan, detecting floods and triggering alarms that give downstream communities ample time to flee to safety.”

**Shehzad Baig**  
Assistant Director, GBDMA



## Success story from pilot areas

### Sherqilla

This area has a history of frequent flash floods triggered by torrential rain. In 2016, local agencies reported that the floods caused around USD 70,000 in damages, sweeping away livestock and houses, and destroying hundreds of acres of scarce cropland.

A CBFEWS was established in Sherqilla in June 2017 based on the success of ICIMOD's previous experience in implementing CBFEWS in Nepal and India. On 3 August 2017, at 4:30 am, the system generated a flood warning activating a siren that woke up 2,800 people from 350 households. The community had an hour to evacuate, moving around 2,000 head of livestock and precious belongings to higher ground before the flash flood hit the village.



## Partnerships build climate resilience of Gilgit mountain villages

Through close collaboration with the Government of Gilgit-Baltistan, the CBFEWS work has now been incorporated into the local disaster management plan. This comes with a history of previous collaboration where, following the 2017 Sherqilla floods, Pakistan's National Disaster Management Authority (NDMA) had acknowledged the efficiency of the system in Gilgit-Baltistan. The NDMA had stated that the system safeguarded Sherqilla's vulnerable community as it battled the elements. Communities have appreciated and taken ownership of the CBFEWS, saying they put them at ease with nature.

In a handover ceremony in July 2019, an agreement was signed with the Gilgit Baltistan Disaster Management Authority (GBDMA). In order to ensure government ownership and sustainability of CBFEWS, all five systems located in Passu (for GLOF), Shighar, Ghanche and Sherqilla (for flash flood) and Damas (for debris flow) were handed-over to the GBDMA. Previously, the government had recognised the contribution of the pilot intervention and its role in raising general awareness on the associated impacts of GLOFs and flash floods in the region. The signing of the agreement shows a transition from a response-based approach to a proactive one. These efforts have strengthened service providers and helped communities adapt to climate change through a mix of preventive as well as responsive measures.



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### For further information

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