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FOR MOUNTAINS AND PEOPLE

Proceedings of the

Meeting on Outscaling Community-Based Flood Early Warning System (CBFEWS) in Pakistan

16 January 2019 | ICIMOD, Kathmandu, Nepal

About ICIMOD

The International Centre for Integrated Mountain Development (ICIMOD) is a regional knowledge development and learning centre serving the eight regional member countries of the Hindu Kush Himalaya (HKH) – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – based in Kathmandu, Nepal. Globalization and climate change have an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people. ICIMOD aims to assist mountain people to understand these changes, adapt to them, and make the most of new opportunities, while addressing upstream and downstream issues. ICIMOD supports regional transboundary programmes through partnerships with regional partner institutions, facilitates the exchange of experiences, and serves as a regional knowledge hub. We strengthen networking among regional and global centres of excellence. Overall, we are working to develop economically and environmentally-sound mountain ecosystems to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream – now and in the future.

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Outscaling CBFEWS in Pakistan

Arun Shrestha
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The piloting of community-based flood early warning system (CBFEWS) in Gilgit-Baltistan, Pakistan, has led to great learning and success. The instrument was developed after eight years of research and development (R&D), and its functionality and sustainability were prioritized during the process. The piloting of CBFEWS in Gilgit-Baltistan has been an excellent experience, and it is encouraging to hear that the Gilgit-Baltistan Disaster Management Authority (GBDMA) intends to upscale the CBFEWS network. ICIMOD has been instrumental in providing technical backstopping during the upscaling process, adopting a four-step approach: conceptualizing learning, piloting, improving local capacity, and upscaling. CBFEWS upscaling in Gilgit-Baltistan can hopefully save lives during water-induced hazards like flash floods.

Dhrupad Choudhury
Chief – Scaling Operations, Adaptation and Resilience Building, ICIMOD

CBFEWS implementation in Gilgit-Baltistan has been a long journey and a great success at all levels. The main aspects of upscaling are sustainability, technical upgrading, and building a community of technical people. CBFEWS fits the "Loss and Damage" workstream of the UN Framework Convention on Climate Change, which defines simple approaches to help local communities build resilience to the changing climate.

Floods are considered to be one of the most recurring and frequent disasters, so the piloting approach needs to adopt emerging technologies that enhance capabilities, thereby ensuring local and regional impacts for disaster mitigation. Climate services is a dimension of ICIMOD's work, which emphasizes on mechanisms to meet user needs and priorities. ICIMOD also prioritizes private-sector partnerships for both innovations and upscaling. It is great to see partnerships among the community, government, and private sector in the CBFEWS upscaling process in Pakistan.

Neera Shrestha Pradhan
Programme Coordinator – SWaRMA, River Basins and Cryosphere, ICIMOD

CBFEWS implementation began with a pilot project in Assam, India, in 2010, following which the instrument underwent an extensive eight-year R&D phase. ICIMOD and Sustainable Eco Engineering (SEE) received the UNFCCC's "Momentum for Change: 2014 Lighthouse Activity Award" in 2014 for their innovative work on CBFEWS. The instrument's importance is apparent. The CBFEWS set up along Ratu River, Nepal, provided adequate lead time during the flood on 12 August 2017, saving human lives and livestock. For the successful utilization of CBFEWS, it is important to focus on aspects such as discharge in tributaries, upstream–downstream linkages, real-time information sharing, and use of low-cost ICT tools for dissemination. CBFEWS involves a holistic approach to disaster risk mitigation: risk knowledge and scoping; piloting; dissemination and demonstration; and response, capacity, and resilience building.

The instrument is effective if the warning is communicated to the most vulnerable communities in a timely manner. An example of such timely and accurate dissemination is an early warning received by Osman Ali, a downstream resident in Barsola, India, in September 2013. With a lead time of one-and-a-half hours, livestock worth USD 3,300 USD was saved, let alone the incalculable value of human lives saved. The process of warning dissemination has also improved social networking and linkages between upstream and downstream communities.

GBDMA's experience: Zaheer U. Babbar, Deputy Director, GBDMA

Two of five pilot projects in Pakistan – Sherqilla and Damas in Ghizar District, Baltistan – can be considered success stories. A CBFEWS was established in Sherqilla for the Gilgit River in June 2017. At 4:30 AM on 3 August 2017, the CBFEWS generated a siren that awoke 2,800 people in the 350 households of Sherqilla. The system safeguarded Sherqilla's vulnerable community as it battled the elements, and GBDMA has committed to upscaling CBFEWS in Gilgit-Baltistan. ICIMOD's support to GBDMA in developing the local vendor's capacity for indigenized CBFEWS manufacturing is much appreciated. GBDMA also requests ICIMOD's assistance in piloting the locally developed CBFEWS in Pakistan for demonstration at a higher level. The next step would be upscaling on part of GBDMA.

WWF's experience: Fazal Karim, Conservation Officer, WWF

The Upper Indus Basin field mission to Gilgit-Baltistan in April 2014 observed local issues related to water management and hazards, consequently resulting in a project funded by the Sustainable Development Investment Portfolio (SDIP) of the Department of Foreign Affairs and Trade (DFAT) – Government of Australia. Under this project, the World Wide Fund for Nature (WWF) and its partners – Aga Khan Agency for Habitat (AKAH) and GBDMA – installed two early warning systems in Sherqilla and Damas during Phase 1. In Phase 2, WWF was responsible for importing the CBFEWS, but obtaining customs clearance has been a difficult process. Eventually, a CBFEWS was installed at Ghanche Nallah and is functioning well. The other system is installed in Shigar Valley, but issues in the instrument such as broken wire need to be resolved.

Discussion points

The process of security and customs clearance was discussed. It was suggested that the army, being one of the institutions committed to responding during any disaster, should be involved from the piloting process. Their involvement can be enhanced through capacity development. The participants emphasized on developing the right framework for involving right partners, including security agencies, for concrete outcomes.

Experience with early warning systems: Presentation by Muhammad Muzzamil, Technical Director, Burraq Integrated Solutions, Pakistan

The key points of the presentation are given below:

- Buraq Integrated Solutions (BIS) was registered in 2001 and started operations in Pakistan in 2004. It has three core sections: information technology, geographic information system (GIS), and weather-related instrumentation.
- It is the sole distributor of Campbell Scientific – USA, ICONICS, Garmin GPS, and Trimble GPS.
- It has vast experience working in instrumentation in the fields of water, agriculture, and weather with national and international organizations such as the Pakistan Meteorological Department (PMD), Water and Power Development Authority (WAPDA), Space and Upper Atmosphere Research Commission (SUPARCO), Atomic Energy Commission, National Defence Complex, University of Faisalabad, Institute of Space Technology, and International Water Management Institute (IWMI).
- In collaboration with the Pakistan Council of Research in Water Resources (PCRWR) and IWMI, BIS has developed the Indus telemetry of five canals. This telemetry is Global System for Mobile (GSM) based with a cloud-based server which can send SMSs to subscribers.
- For indigenizing CBFEWS in Pakistan, there are two options: a). Campbell Scientific and b). Pakistan-made CBFEWS.
- A tripartite memorandum of understanding (MoU) between ICIMOD, BIS, and GBDMA could pave the way forward.

Question: Is it possible to make the system without GSM?

Answer: Instead of GSM, fiber optical instruments can be considered. Our approach involves establishing a linkage between CBFEWS and GBDMA by GSM, fiber optics, or ultra high frequency (UHF) medium.

ICIMOD's experience with CBFEWS:
Presentation by Vijay Khadki, Early Warning System Analyst and Dipankar Shakya, SSA, SWaRMA, ICIMOD

The key highlights of the presentation are given below:

- The equipment itself constitutes only 20% of effective CBFEWS implementation, which is based on four elements. The involvement of technical partners is key to success.
- These four elements include risk knowledge and scoping; piloting; capacity and resilience development; and upscaling.

Way forward and discussion:
Neera Shrestha Pradhan, Programme Coordinator – SWaRMA, River Basins and Cryosphere, ICIMOD

Discussion
The following are the key questions put forward by Neera Shrestha Pradhan:

Question	Response
What is the partnership modality between SEE and BIS?	**Muhammad Muzzamil:** BIS is keen to learn more from the experience of SEE and ICIMOD in CBFEWS implementation. **Abdul Wahid Jasra:** Both BIS and SEE shall figure out the modality of business.
If the local manufacturing of CBFEWS in Pakistan begins, are we interested in conducting R&D again? Since the current system was developed after eight years of R&D, could GBDMA clarify its position regarding this?	**Zaheer Uddin Babar:** BIS would need to take up the research. Just instrument transfer is not enough; technology and concept should be transferred. It should be stressed that the system should be a simple technology used for alerting people, providing real-time flood warnings to reduce flood risks.
The equipment constitutes just 20% of CBFEWS implementation, which is based on four elements. During technology transfer, there is a need to take into account these elements. Who will ensure that these four elements are considered during the upscaling process?	**Dhrupad Choudhury:** During technology transfer, there is a need to take care of two aspects: appropriate technology and upscaling and sustainability of CBFEWS.

Way forward

1. **Partnership modality:** A memorandum of understanding (MoU) between ICIMOD and GBDMA, under which BIS and SEE will work together for the transfer of the CBFEWS package
2. **SEE and BIS shall develop an agreed system for GBDMA:** Both shall come up with projected costs by mid-April
3. **Piloting of developed system at one place in the Gilgit region and another in the Baltistan region:** GBDMA shall revert with the budget it can support. It was agreed that resources from ICIMOD and GBDMA shall be pooled for the piloting purposes.
4. Upscaling through Project Cycle 1 (PC–1).
5. Pakistan country office to follow up with GBDMA.

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