



Ram Kisun Koiri shows his community's flood gauge that measures water levels.

TRANSBOUNDARY FLOOD RESILIENCE IN NEPAL AND INDIA

TBR CONSORTIUM MEMBERS:

Lutheran World Relief (LWR), Asian Disaster Preparedness Center (ADPC); DanChurchAid (DCA); Grameen Development Services (GDS); Integrated Development Foundation (IDF); Koshi Victim Society (KVS); SAHAMATI; Yale University Himalaya Initiative

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THE PROBLEM

Communities in the Gandak/Narayani and Koshi river basins along the Nepal-India border are closely linked not only by cultural and socio-economic ties, but by shared vulnerability to meteorological stressors. According to projections from the World Resources Institute Aqueduct Global Flood Analyzer, floods affect up to **156,600 people in Nepal** and **10.5 million people in India** every year. Exacerbated by climate change and significant glacier melting in the Himalayas, annual flooding events, which typically occur during monsoon season and originate in the mountains of Nepal, wreak havoc on low-land communities in Nepal and India, killing people, livestock and crops. These communities are largely inhabited by marginalized groups struggling with poverty. With few income generating options available, most rely on farming to survive, but when floods disrupt their sole livelihood, they have little means to recover. Floods destroy whatever income and food security gains these farmers manage to make each year. As such, annual flooding is one of the main stressors eroding the ability of transboundary communities in this region to achieve development outcomes, including a better quality of life.



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THE PROJECT

Through the Transboundary Flood Resilience (TBR) project, Lutheran World Relief (LWR) and our local and international partners are assisting communities located along the India-Nepal border to better prepare for and strengthen their resilience to the devastating effects of annual flooding. That is to say we are helping these communities build their capacities to **absorb** the impacts of flooding, to **adapt** to change, and to potentially **transform**, in a manner that enables them to achieve and maintain their development results. To build these capacities, we aim to create and improve upon the following in project communities: financial safety nets, diversified livelihoods, disaster risk reduction (DRR) practices, community-based flood early warning systems (EWS), citizen advocacy forums, and government support. We believe these six elements constitute the pillars of a flood resilient community and can be replicated in other flood-prone areas to the same effect.

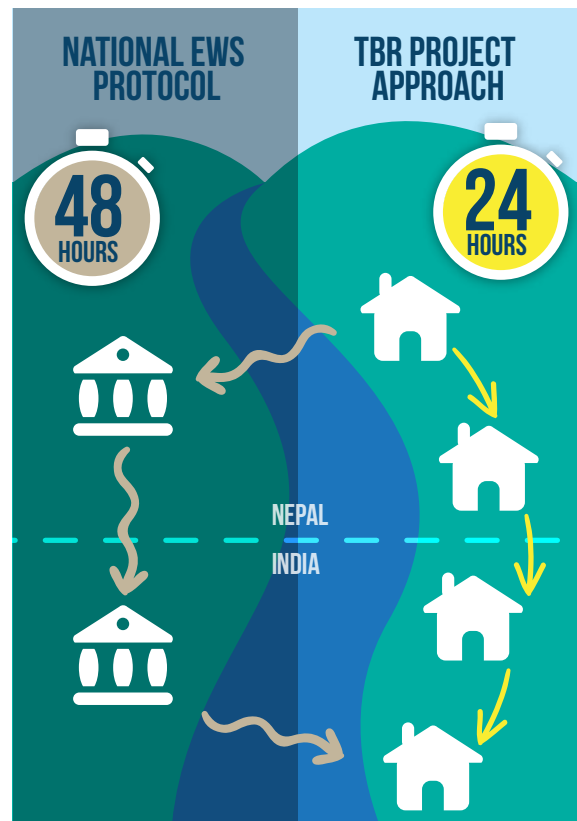
LWR launched the TBR project in 2013 and reached 51,966 community members in 136 villages across India and Nepal by the end of 2016. The project's success led to an award by Global Resilience Partnership in January 2016 to expand the project through July 2018 to **reach a total of 71,300 community members in 178 villages**, and to strengthen the partnership to ensure more robust linkages to district and national level government institutions and policies.

COMMUNITY-BASED PREPAREDNESS

LWR and our partners are organizing community members into community disaster risk management committees (CDMCs) as well as into *transboundary* citizen forums¹ (or strengthening groups that already exist) to prepare and provide early warning, first aid, search and rescue, and rehabilitation services to their communities. Members of these groups are trained in DRR and EWS and provided with lifesaving tools, such as sirens, mobile phones, megaphones, radios, flags, ropes, life jackets, boats, flashlights and temporary stretchers. CDMCs are also trained in the practical application of LWR's Dynamic Resilience Wheel² analysis model, which they can use to strengthen their ability to analyze local issues and develop local solutions to address issues affecting their capacity to cope with annual flooding. These groups are also the implementers and the managers of the TBR project's real-time flood warning information system — a system to improve the effectiveness of official government communication channels for EWS. This

¹ These new transboundary citizen forums are federations of community-based disaster management committees and operate at a regional level in each river basin. They are the first shared cross-border platforms for learning, advocacy, and action on mitigating the effects of flooding.

² The Dynamic Resilience Wheel (DReW) provides a dynamic snapshot of the key components of resilience thinking in development environments. Composed of multiple rotating layers, DReW offers a dynamic lens to help learn about and apply the main factors that play a role in resilience building. <https://lwr.org/what-we-do/resilience/wheel>



LWR's TBR project doubled the speed of real-time flood warning information traveling downstream from 48-hours using official national EWS communication channels to only 24 hours (and even to 15 hours in some cases) using the transboundary community-driven EWS approach piloted in TBR. Figures on the left represent official government to government communications, while those on the right represent community-based forums and committees that communicate directly to households.

new system enables communities to share EWS alerts from upstream communities directly to their downstream neighbors in a chain-like fashion, rather than relying on government to government communications across borders. When an alert from an upstream community is received, the members of the downstream community's CDMCs spread the information throughout the village while also passing the alert on to the next downstream community. Communities have reported that this more direct cross-border village-to-village EWS mechanism has more than doubled the speed of flood warnings — from a 48-hour relay to 24 and to even 15 hours in some cases. More than 100 CDMCs on both sides of the border are now leading EWS efforts in their communities.

The TBR project also promotes access to social insurance schemes and savings mechanisms and includes livelihood components such as agricultural training in flood resistant crops, diversification to help farmers ensure multiple sources of income and food, among others. To date, the project has increased farmers' incomes, with around 62 percent of communities having adopted new livelihood strategies, and formed or strengthened more than 100 community-based self-help groups (SHGs) to promote savings and improve access to credit. The project helps CDMCs establish emergency funds for use of

the community as well. These activities are all geared toward increasing financial security and resilience to financial stresses post-disaster.

LWR and our partners are working closely with the Governments of India and Nepal as well as with the Asian Disaster Preparedness Center (ADPC) to advocate for and advise on the national and regional adoption of TBR practices. This includes policy analysis and guidance from Chatham House that will inform effective DRR among government and practitioner organizations. LWR also organizes stakeholder visits to project sites on both sides of the border to showcase project interventions. Furthermore, in support of the advocacy and learning agenda, the Yale University Himalaya Initiative has developed a resilience measurement tool, used to analyze, monitor and share the status of TBR interventions in the region through an accessible online platform.



A REAL TEST

In August 2017, Nepal and India experienced its worst rains in 15 years, resulting in significant loss of life and impacting lives, livelihoods and infrastructure across 35 of Nepal's 75 districts and at least four states of India. LWR's TBR project area, within two river basins (Koshi/Gandak and Narayani), was severely affected. Due to the heavy rainfall, 80 percent of the India side of the TBR project was waterlogged for two days, and most of the project areas in Nepal were affected by the flood in both river basins.

While a devastating event, the flood provided an opportunity during the project period to assess the project's impact on participating communities. LWR, with its Yale Himalaya Initiative research partner in the TBR project, conducted a qualitative, rapid post-flood assessment across TBR project communities through focus group discussions and key informant interviews. The assessment gathered information in response to key questions such as:

- 1 Did communities and families benefiting from the TBR project apply new capacities and resources developed through the project to better prepare for and withstand the negative impacts of the flood? Which project interventions are working well?

- 2 What were the major losses or project challenges that impeded targeted communities in their flood preparedness and recovery?
- 3 How can LWR and implementing partners address gaps in the project to enable more effective preparedness and recovery strategies in future floods?

PROJECT SUCCESSES

- **PREPAREDNESS:** Community members reported that CDMCs and EWS task force groups were organized and active, and the passing of information from upstream to downstream communities contributed to the prevention of deaths and property damage. For example, in Nepal, designated CDMC members contacted the Department of Hydrology and Meteorology (DHM) for information and ensured communities received mass SMS notifications on the Nepal side of the Koshi River basin and then passed messages to the transboundary communities in India. As a result, communities had adequate warning time to move to higher ground with their valuables. Participating TBR project communities reported only one death in the India project zone (Gandak river basin) and no casualties in the Koshi river basin.
- **EMERGENCY RESPONSE:** An outage in the mobile communication system in the Gandak river basin meant that downstream communities did not anticipate the volume and severity of the oncoming floods. However, after the flooding occurred, most of the communities utilized their emergency response strategies, employing search and rescue operations with boats provided by the project, enacting emergency shelter plans at designated community or home-based shelters, and raising platforms.
- **RECOVERY:** The assessment determined that the most affected families on both sides of the border accessed emergency funds, or social insurance, established through the project. CDMCs in two municipalities covered by the project in Nepal also provided emergency loans to families whose houses or agricultural fields were destroyed, while affected families in India accessed loans or micro-credit through Self-Help Group savings or through linkages to other loan institutions. Surveyed families also reported that they accessed emergency food rations through project-established grain banks.

REMAINING CHALLENGES

- In unirrigated land, annual pulses, vegetable crops, and fruits were destroyed due to the lack of drainage and inundation.
- Mud or thatched homes did not withstand the floods well. Schools, roads, and culverts were also damaged as a few communities reported having completely submerged roads.
- Stored grains were a major loss in TBR project zones where communications were slower and families did not have time to relocate their grain reserves to higher platforms.

- Communal wood and animal fodder was washed away by the floods in some communities where storage techniques were vulnerable to flood.
- In Nepal, survey respondents reported that the major challenges included loss of livestock, water-borne illness, damage to agriculture land, including erosion and siltation, and damaged roads and culverts.
- In India, respondents reported a lack of safe drinking water, illness and poor access to medicine, crop damage, and wild animal encroachment as major challenges in the post-flood environment.

LESSONS LEARNED AND RECOMMENDATIONS

- 1 Failed phone networks pose a threat. Alternative, back-up methods of early warning communication need to be identified and employed. In response to this immediate concern, LWR is working with the International Centre for Integrated Mountain Development (ICIMOD) to install and train communities in the project zone on ICIMOD's recognized scientific telemetry system, which is a community-based flood early warning technology that operates when mobile networks are down. The project will also explore how to utilize border police and local law enforcement to support natural disaster early warning communications between cross-border communities.
- 2 Erosion contributes to greater loss of agricultural assets. TBR interventions will consider including support for mitigation of eroding river embankments, such as afforestation and reforestation.
- 3 In both Nepal and India, grain storage continues to be a significant vulnerability. The project will consider providing additional incentives and resources for construction of protected platforms. Another possible solution is to explore alternative ways to use water soaked stored grains, such as for livestock feed or compost additive, so that households are less vulnerable to losses.
- 4 In India, climate smart (flood resistant) seeds are being used with reportedly positive impacts. Introducing more of these climate smart crops in Nepal and other communities in India will support more resilient communities.
- 5 Savings, insurance, emergency funds, and grain and seed banks are sought after recovery mechanisms for disaster-affected families and contribute to more rapid recovery. Thus, such activities need to be further strengthened and systematized.
- 6 Water-borne illness in flood zones and lack of access to health services is a serious challenge for vulnerable families trying to recover from floods in rural areas. The project has already begun to build better linkages to government health services to lessen the spread of water-borne illness during flood events.

LOOKING AHEAD

The TBR project has been an important opportunity for LWR to work alongside local community-based, research, and international organizational partners (forming the "TBR Consortium") to document and improve upon a holistic model that addresses flood preparedness and resilience in a cross-border context. The combined use of community-based EWS, livelihoods strengthening and advocacy requires a multi-stakeholder approach and well-coordinated partnerships. LWR seeks to continue to lead the TBR Consortium in an effort to:



- 1 Expand the numbers of communities and individuals participating in project activities in the currently targeted Koshi and Gandak river basins. Project expansion would include improvements based on the lessons learned from the 2017 flood event and the new recommendations from ADPC for institutionalizing the transboundary citizen forums;
- 2 Strengthen the project's focus on resilient livelihoods using information captured through Yale University's resilience measurement tool. This may include offering new components of support to smallholder farmers (including livestock farmers) to further help them build their agribusinesses through cooperatives and link to financial services and insurance schemes;
- 3 Replicate the project in other river basins, especially within Nepal. As the government focuses on building the capacities of its recently restructured federal and provincial areas, the TBR Consortium is positioned to support their revisions of DRR policies and EWS at the local government level.

LWR has a long history of building the resilience of vulnerable communities affected by recurrent natural disasters and climate variability. The continuation of the TBR Consortium's work is in line with LWR's strategic priority to work in close collaboration with a broad set of stakeholders, including government, community-based organizations, peer agencies, academic institutions, and the private sector, to continuously learn, innovate and strengthen our approach to resilience and disaster preparedness. Through TBR project expansion, LWR will apply our learning to our global programming and will inform the wider development sector's understanding of how to build resilient communities.



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