

Improving upstream-downstream cooperation for cross-border floods and resilience building

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HINDU KUSH HIMALAYAS

A Global Asset



ICIMOD

FOR MOUNTAINS AND PEOPLE



CORE COMPETENCIES



Livelihoods



Ecosystem Services



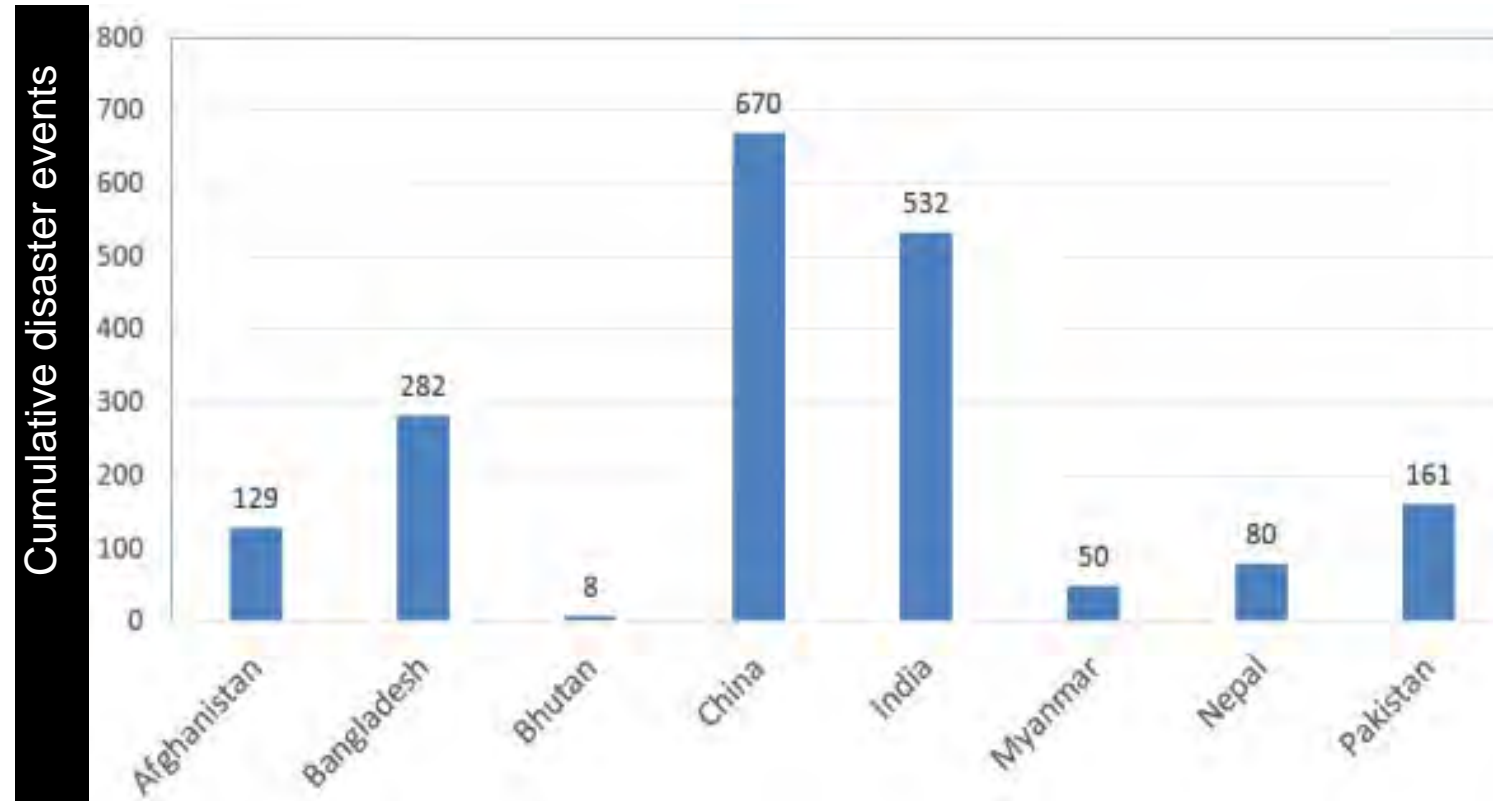
Water and Air



Geospatial Solutions

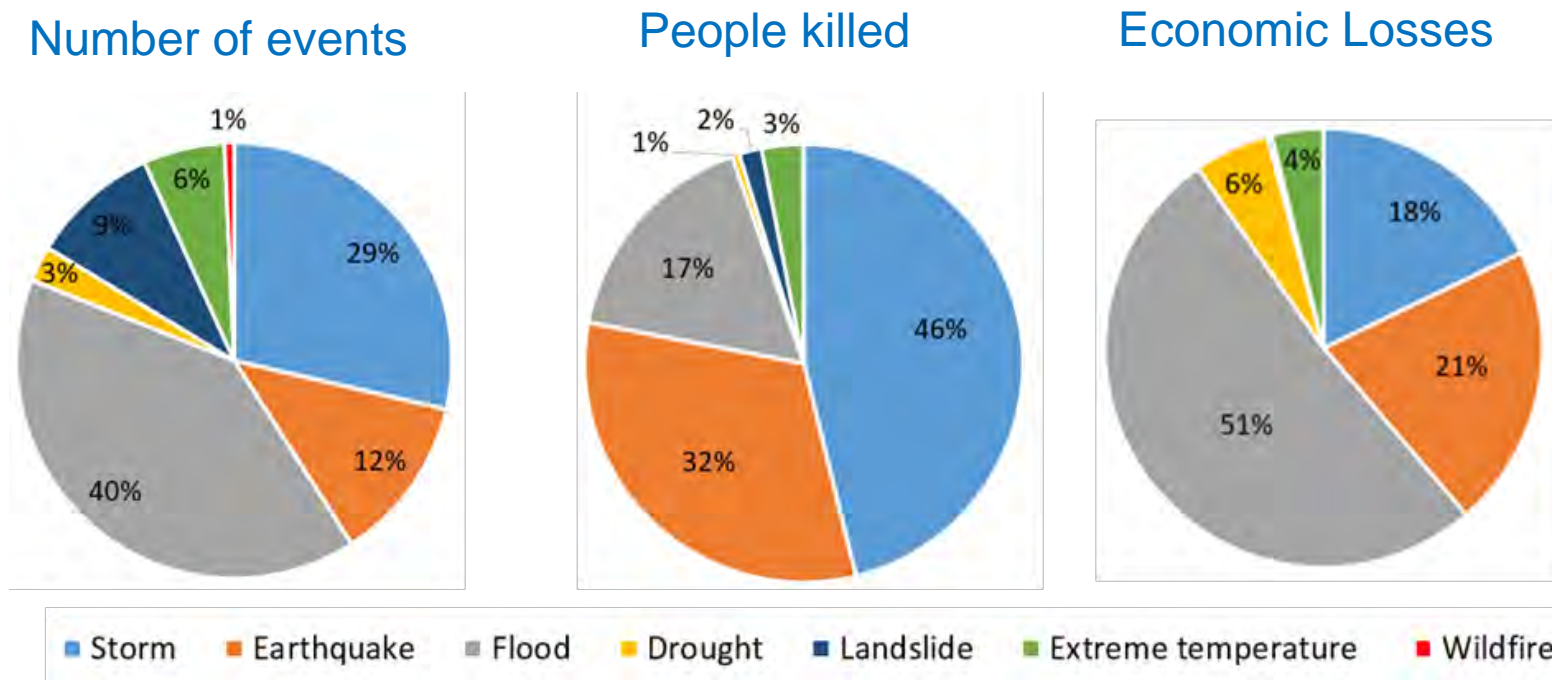
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Disaster Statistics from 1990-2012 in the HKH Region



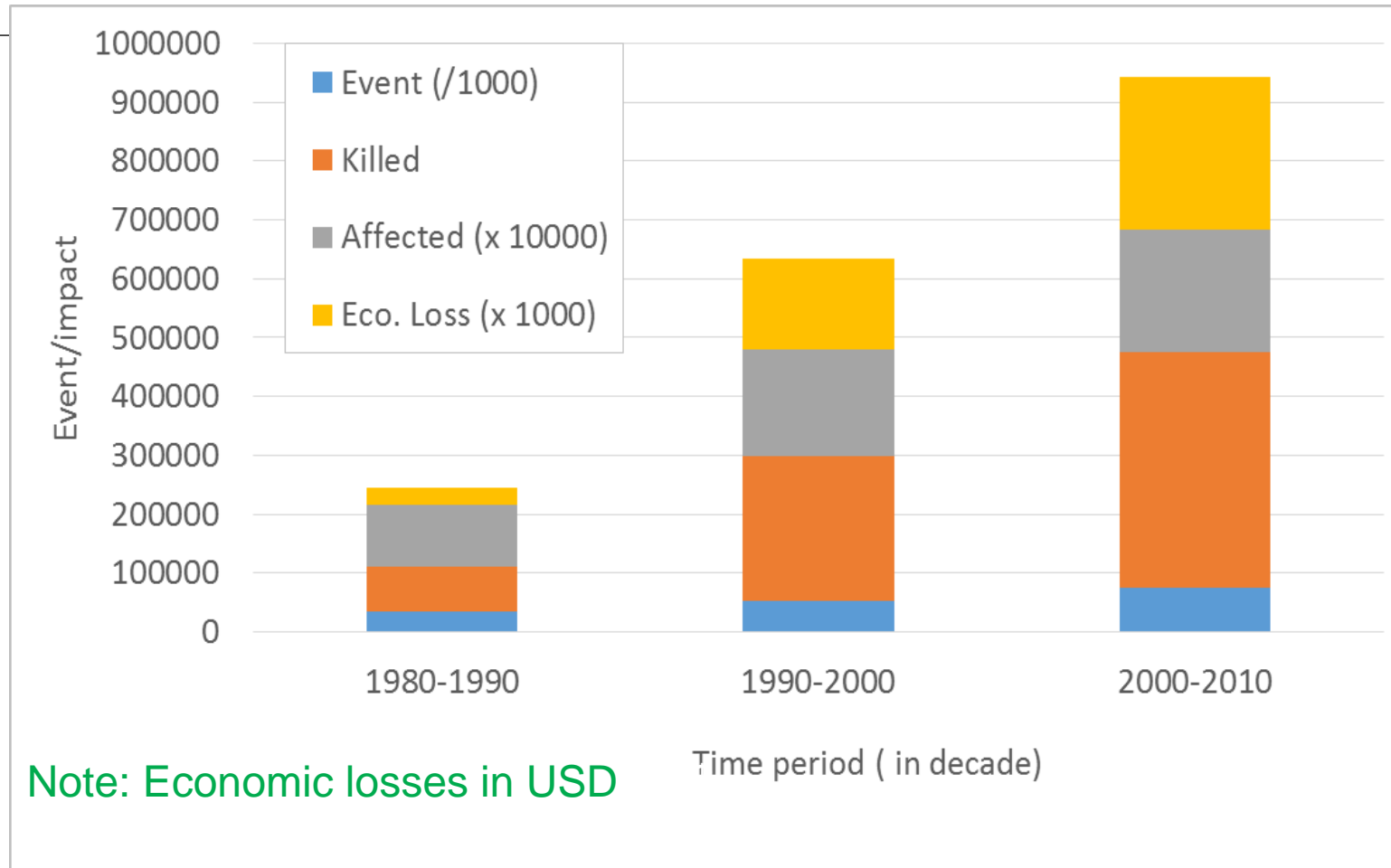
The region has had an average of 76 disaster events each year.

Mountain Communities in the HKH live in a Multi-hazard Environment

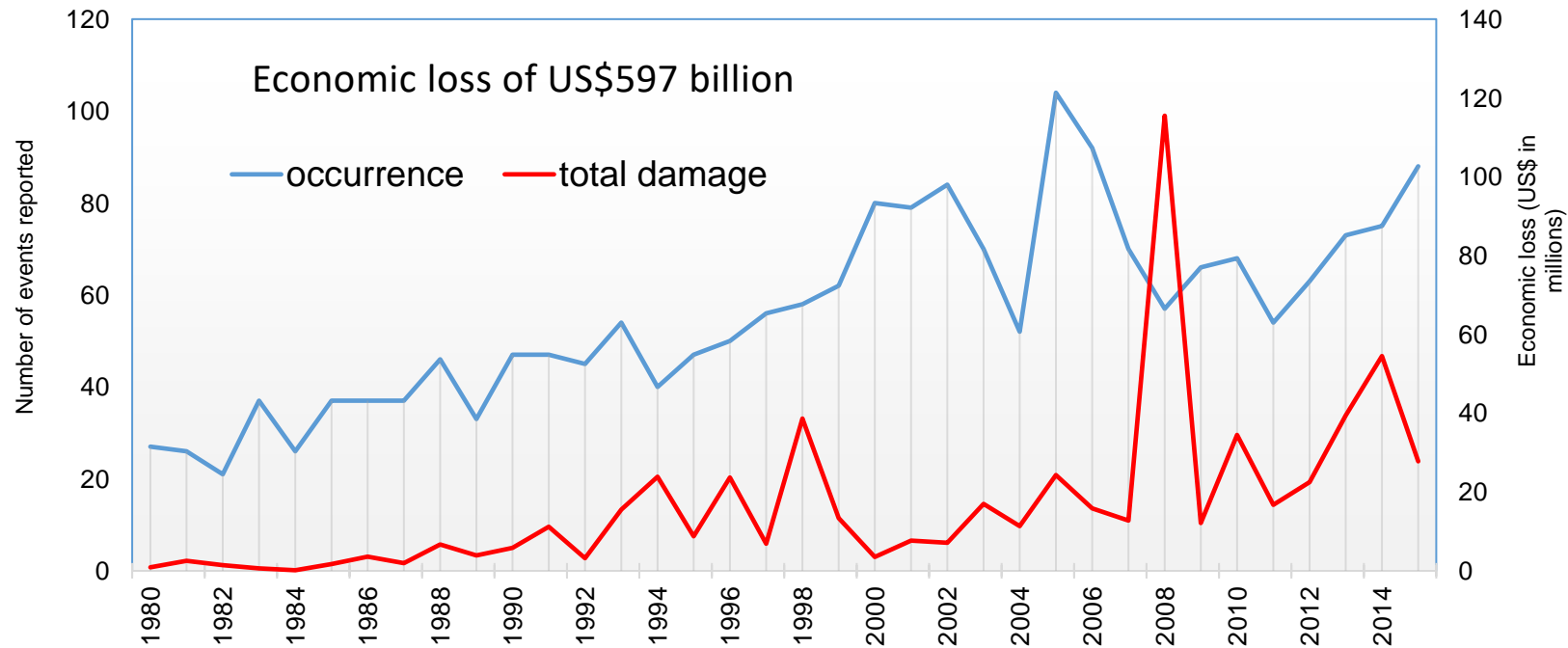


On average, more than 36,000 people are killed and 178 million affected each year due to natural disasters in the region.

Disaster events in the HKH are increasing each year



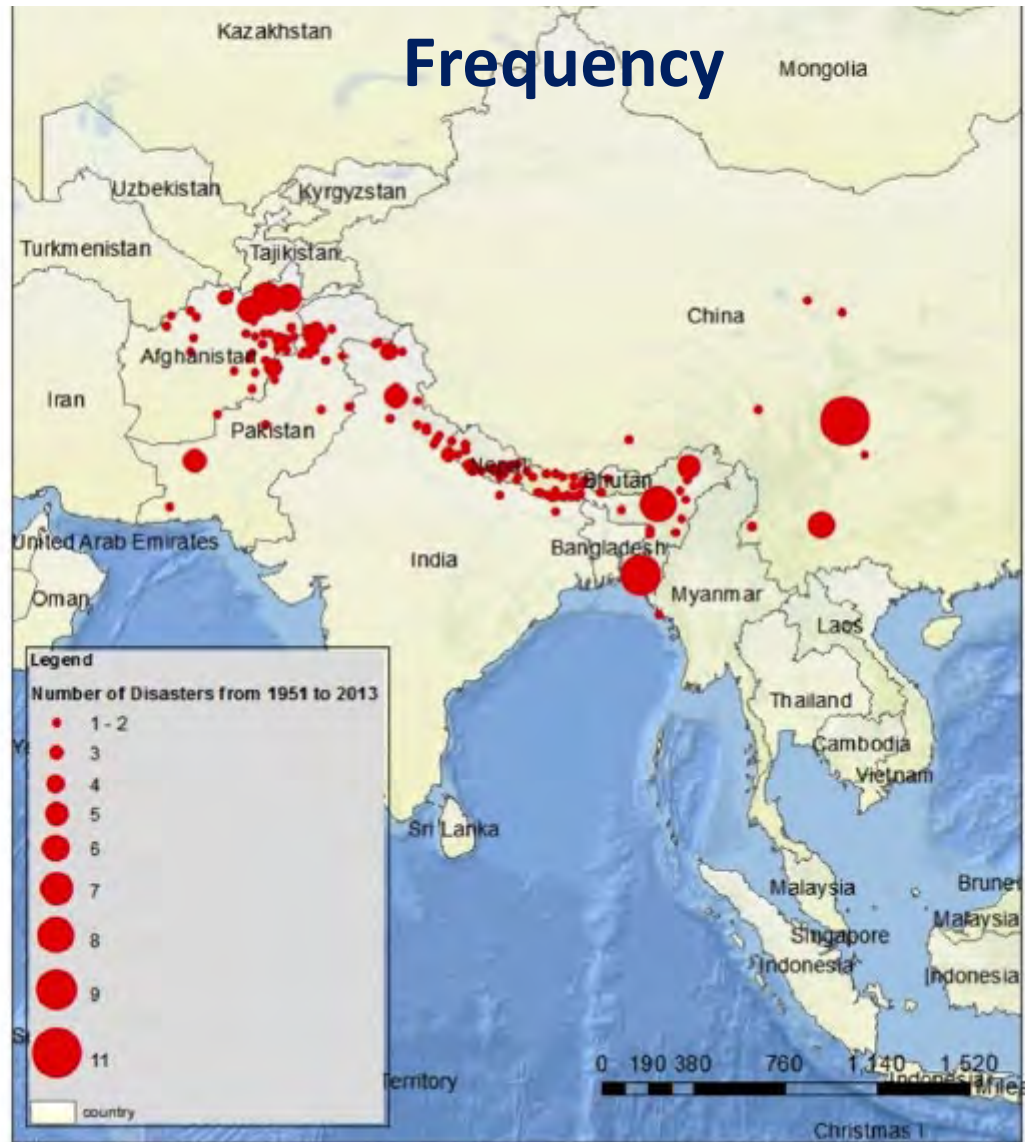
Increasing trend of disasters in the HKH is threatening sustainable development



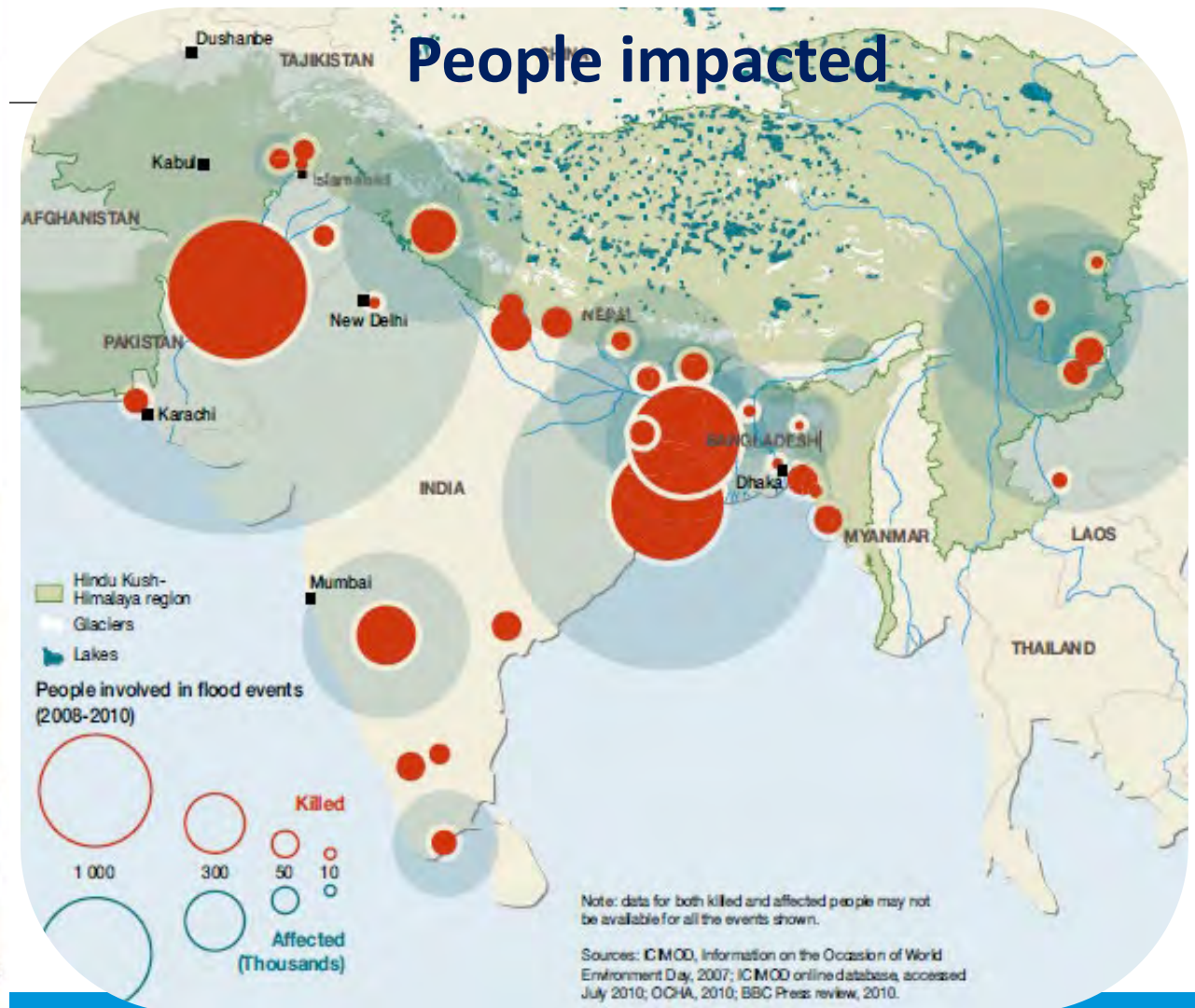
Source: EM-Dat Database

Climate change is magnifying risks and increasing disaster losses (UNISDR 2015): [Need for regional cooperation](#)

In the HKH, one-third of the natural disasters are floods

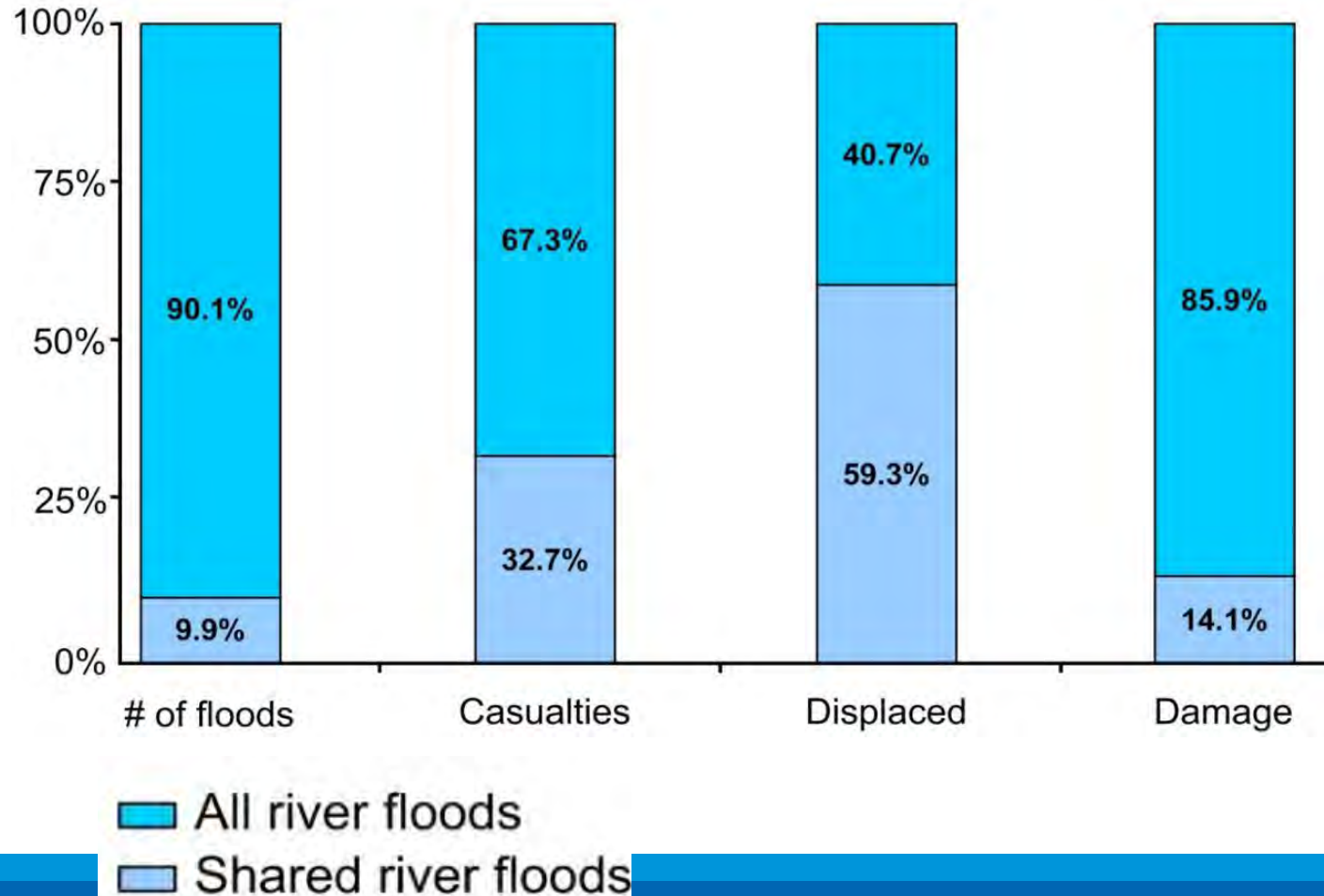


Source: Ilalem and Pal, 2014



Source: Nellemann et al., 2011

Transboundary rivers – shared vulnerability across borders



Globally,

- 10% of all floods are transboundary,
- they cause over 30% of all flood casualties
- account for close to 60% of all those displaced by floods

Flood and Flash Flood

ss.com

Indus, Pakistan - 2010

Assam, India - 2013

Baghlan, Afghanistan - 2014

Uttarakhand, India - 2014

Biratnagar, Nepal - 2017



Communities - the first responders



Koshi - 2008

american.edu/ted/ICE/terai.html

When disasters hit they affect more women than men

- 1991 cyclone in Bangladesh - the mortality rate for women was three times higher than for men (UNEP 1997; Twigg, 2009)
- 2015 Nepal earthquake - more women than men died in all the affected districts except Kathmandu (Golam et al., 2015)
- Records of natural disasters in the Himalayan region over the last few decades show that women are at greater risk of dying than men (Mehta, 2007)



Koshi, Nepal Flood, 2008

This is the result of women's lack of information, mobility, decision-making power, and access to resources and training, as well as gender-based sociocultural norms and barriers, conventional gender responsibilities, and high rates of male outmigration.



Are we reaching the most vulnerable ?



Community Based Flood Early Warning System (CBFEWS)

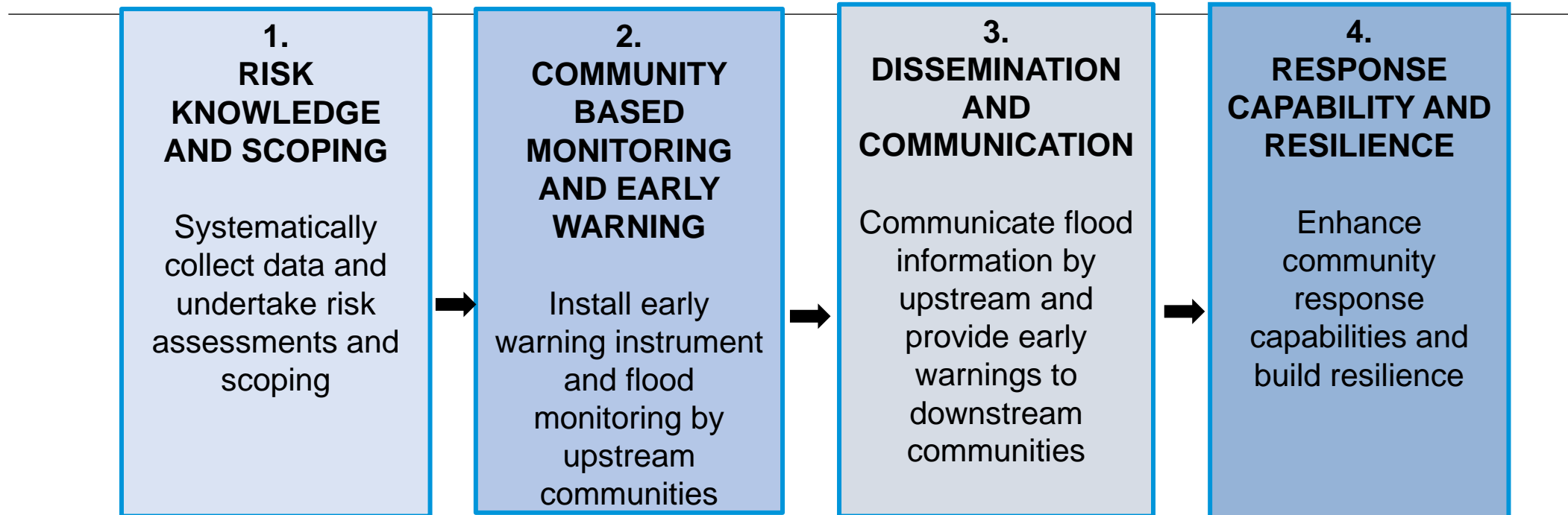


1. Implemented in river tributaries
2. Upstream/downstream linkage
3. Almost real time information
4. Provide guidance on how to act on warnings
5. Use of low cost ICT tools



Four elements of CBFEWS

More than just a prediction...



Source: Based on UNISDR, 2006, <http://www.unisdr.org/2006/ppew/whats-ew/basics-ew.htm>

1: Risk Knowledge & Scoping



2. Community Based Monitoring and Early Warning

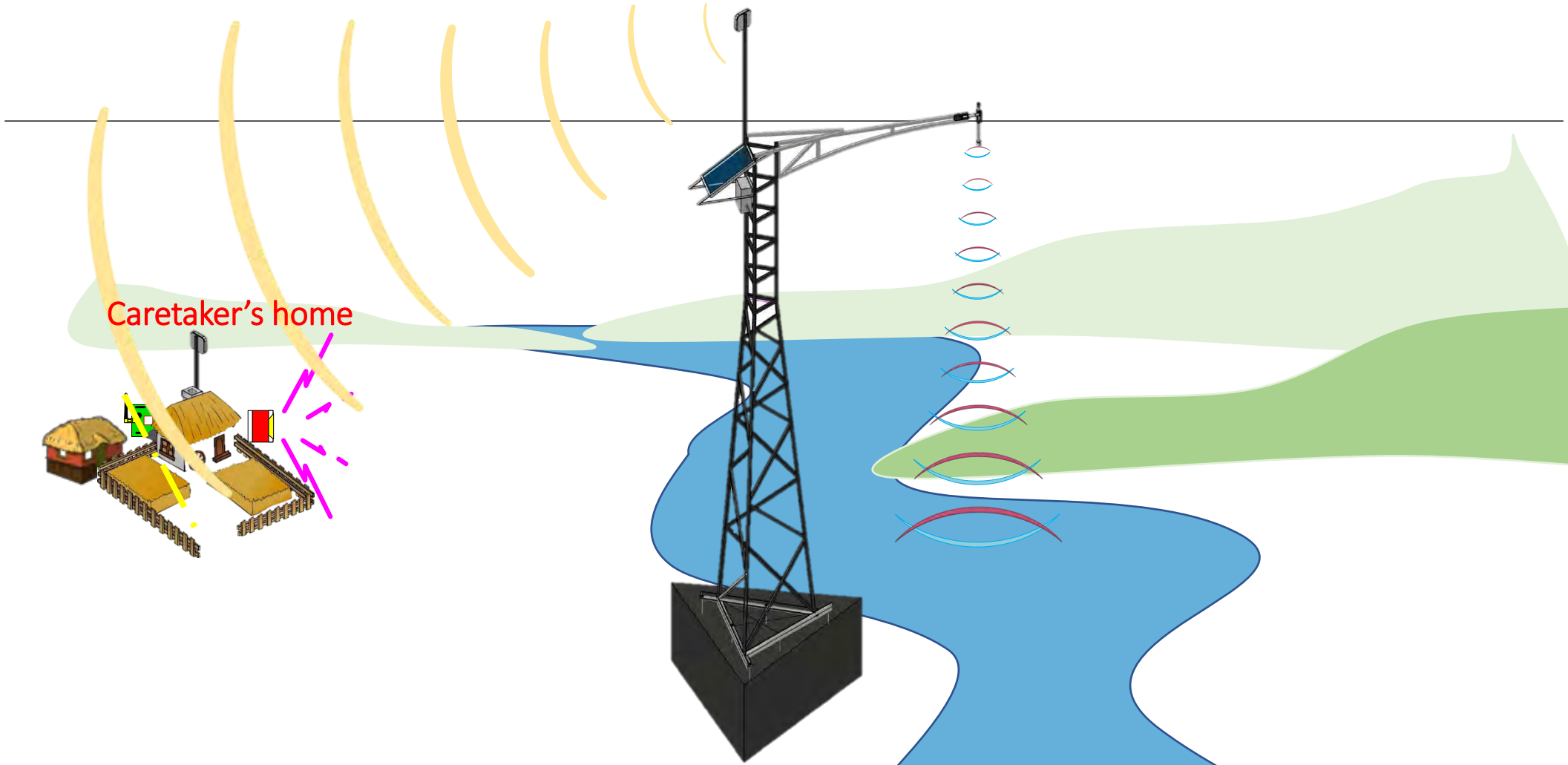
With wire (2010), Assam



Wireless technology (2012), Assam



Telemetry based (2017), Patna



Caretaker's home

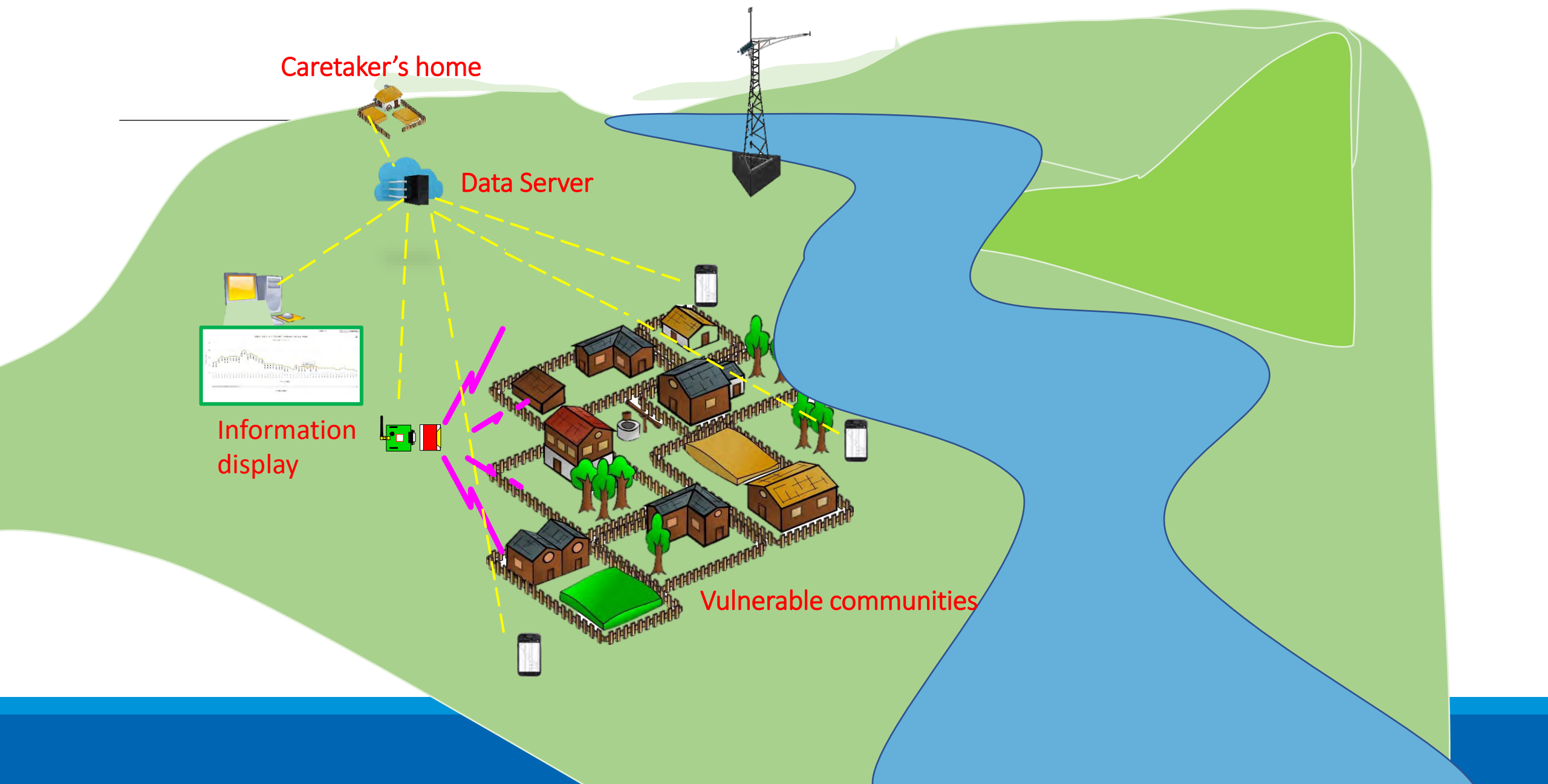
Transmitter

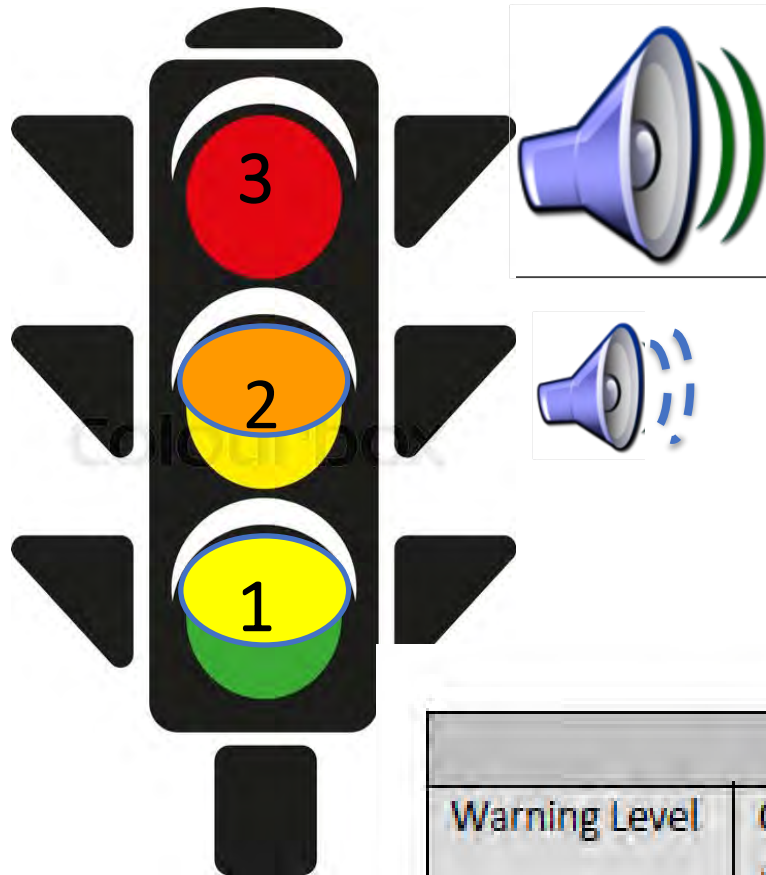
Caretaker's home




Data Server

Information display

Vulnerable communities



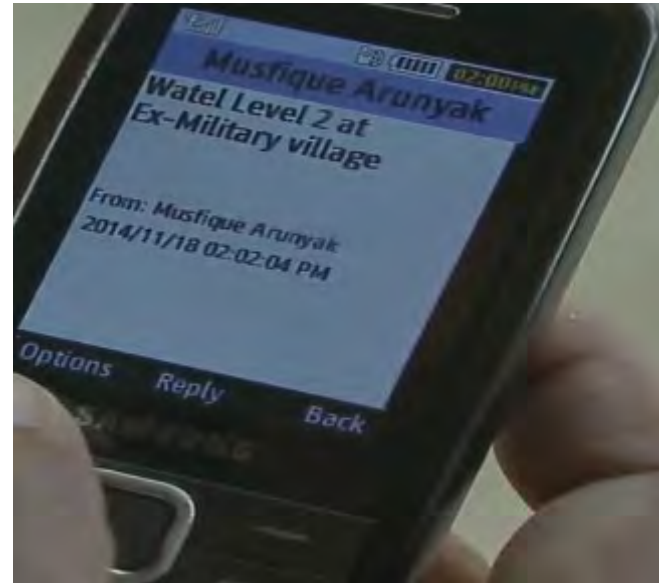
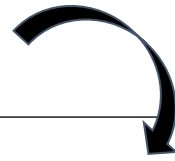


Warning Level	UPSTREAM		DOWNSTREAM	
	Color of LED light	Siren signal	Interpretation	Action
Level 1		No siren	High probability of flood	Be Alert and Standby
Level 2		Beeping sound	Flood is inevitable in few hours	Be Prepared
Level 3		Continuous ringing	Flood is coming	Evacuate for safety

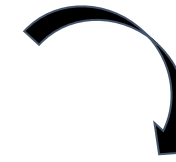
3: Dissemination and Communication



Caretaker (upstream)



SMS to downstream



Downstream focal to communities

4: Building Resilience



Help them prepare .. not panic...

Training at local level



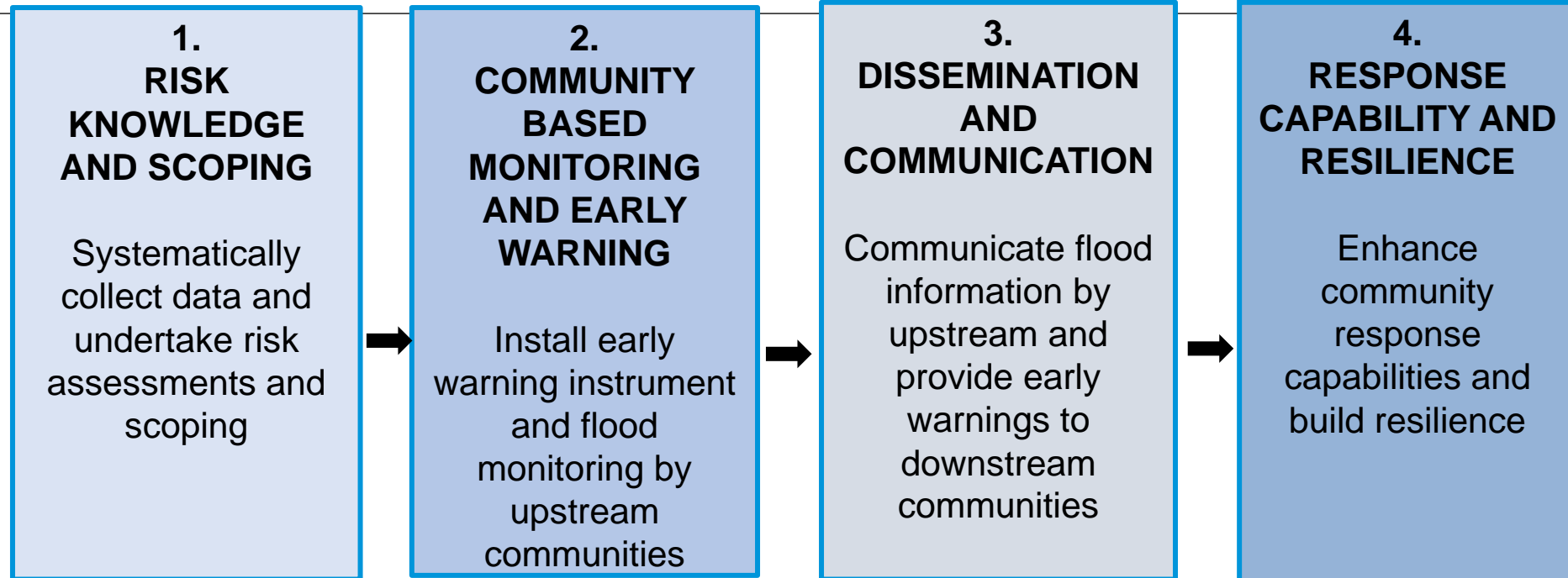
5-days regional hands-on training on CBFEWS

(Conducted as per demand)



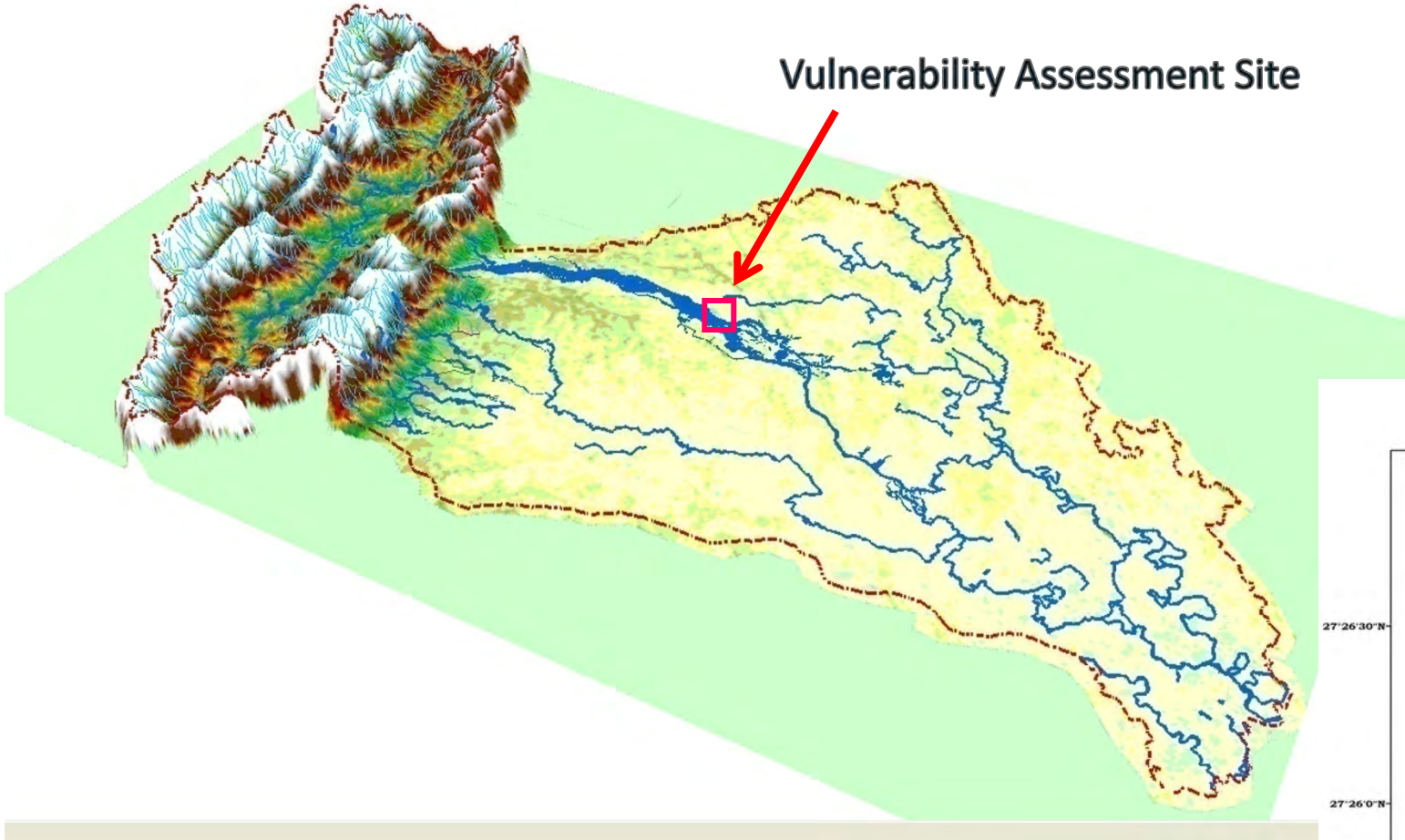
Four elements of CBFEWS

More than just a prediction...

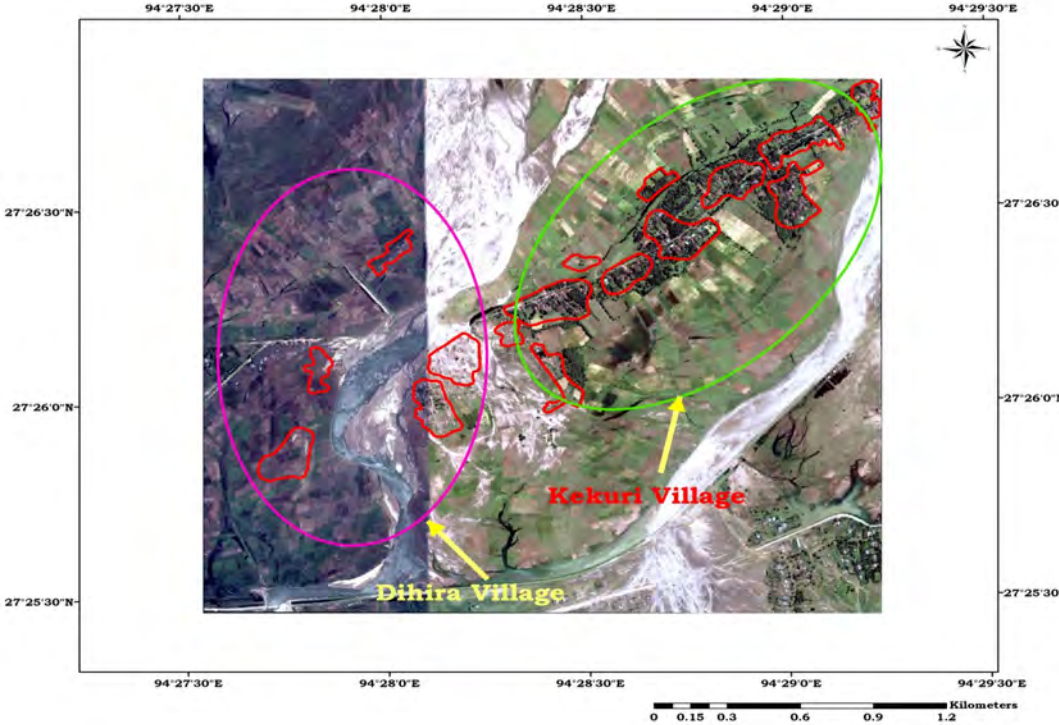


Source: Based on UNISDR, 2006, <http://www.unisdr.org/2006/ppew/whats-ew/basics-ew.htm>

Jiadhhal River, Assam, India



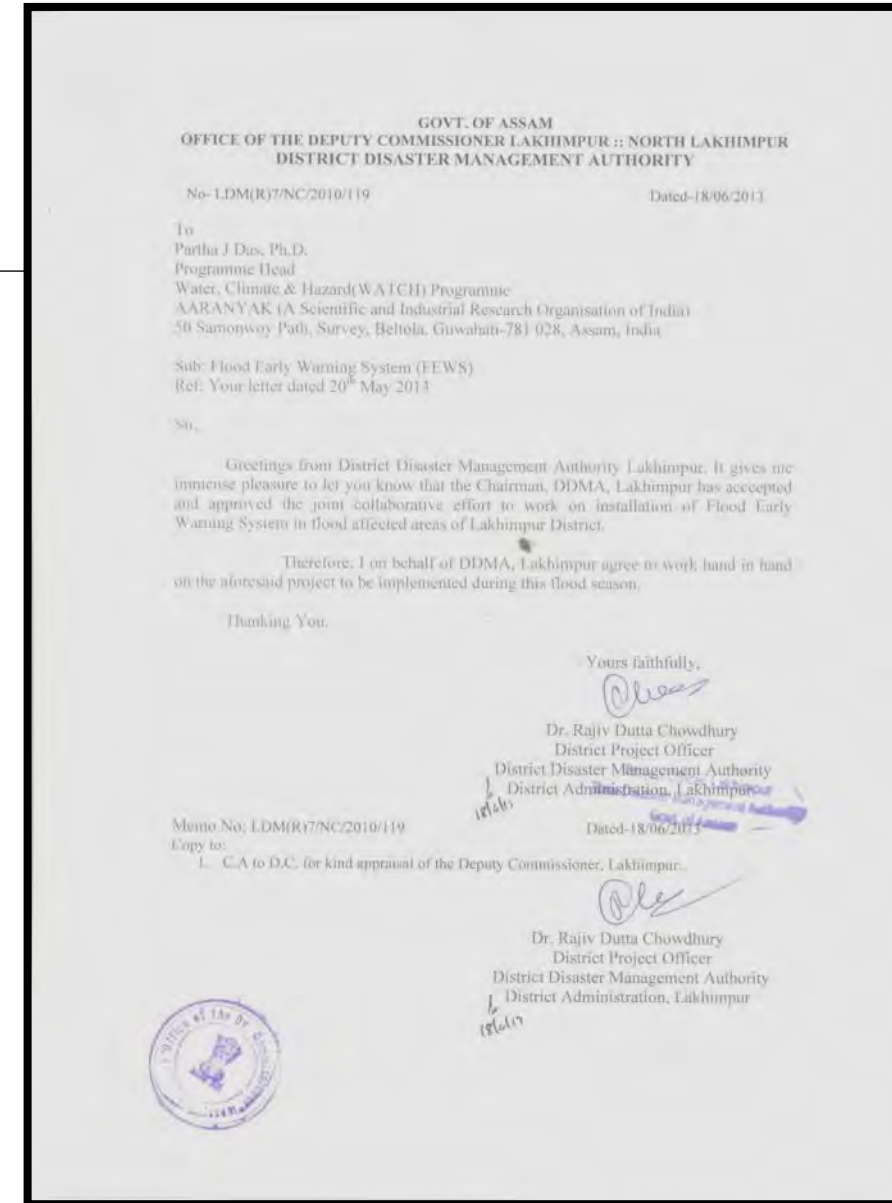
Risk, Hazard, Vulnerability Assessment Area



September 2013



Saved assets, including livestock, worth approximately USD 3,000.





“Up/Down stream
people got married with
each other !!!!”

Ratu River, Nepal-India Border

An example of local level cross border cooperation between Nepal and India



Bardibas, Nepal

Approx. 75 Km
(Aerial distance)

Bittamore, India

12 August 2017

An example of local level cross border cooperation between Nepal and India



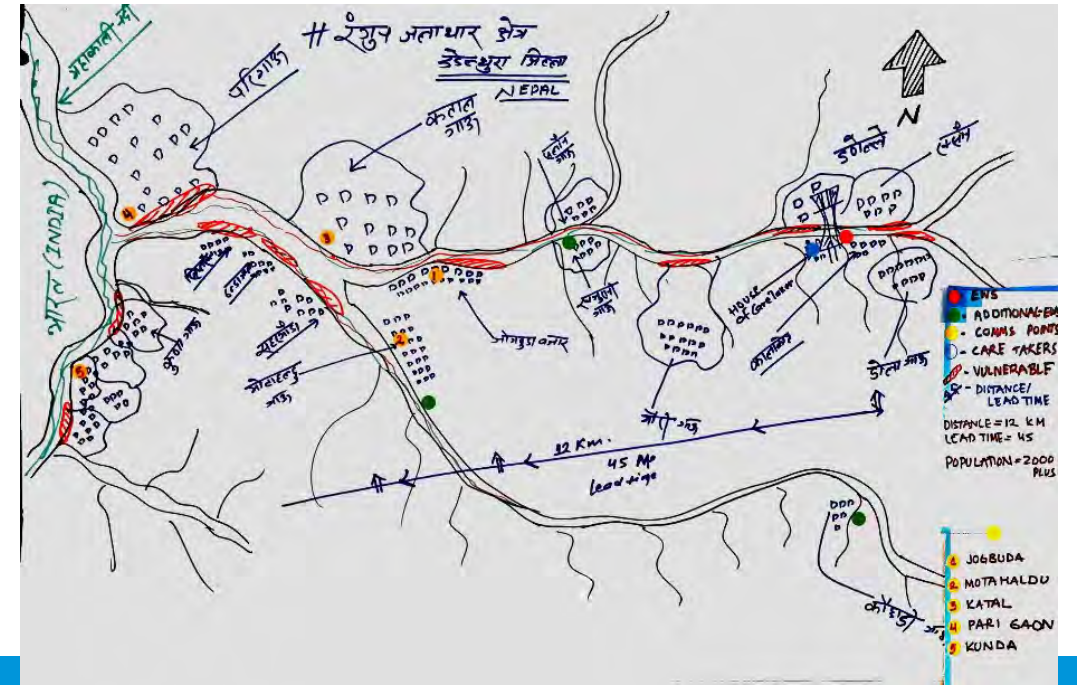
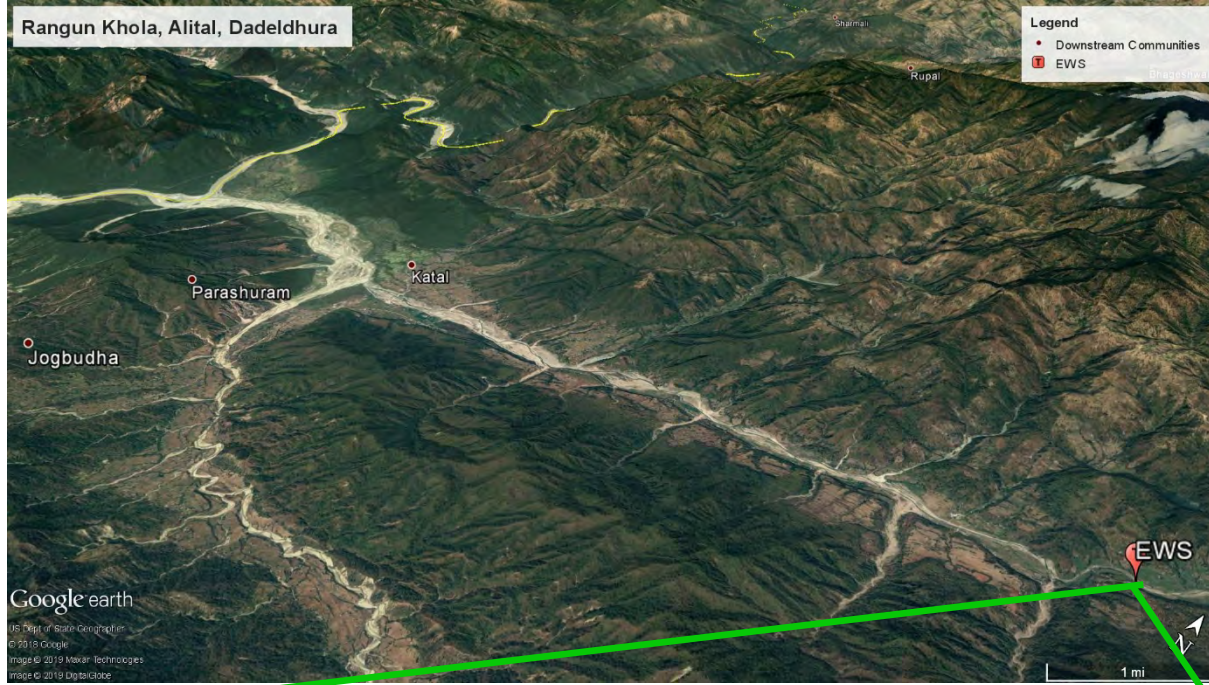


This system is very useful

“Even if our husband migrate for work, we do not worry because we know that this system will inform us on time to prepare for the upcoming flood”.
Mrs. Rinku Devi, Mahottari, Nepal

Rangun River, Mahakali Basin

An example of successful CBFWS

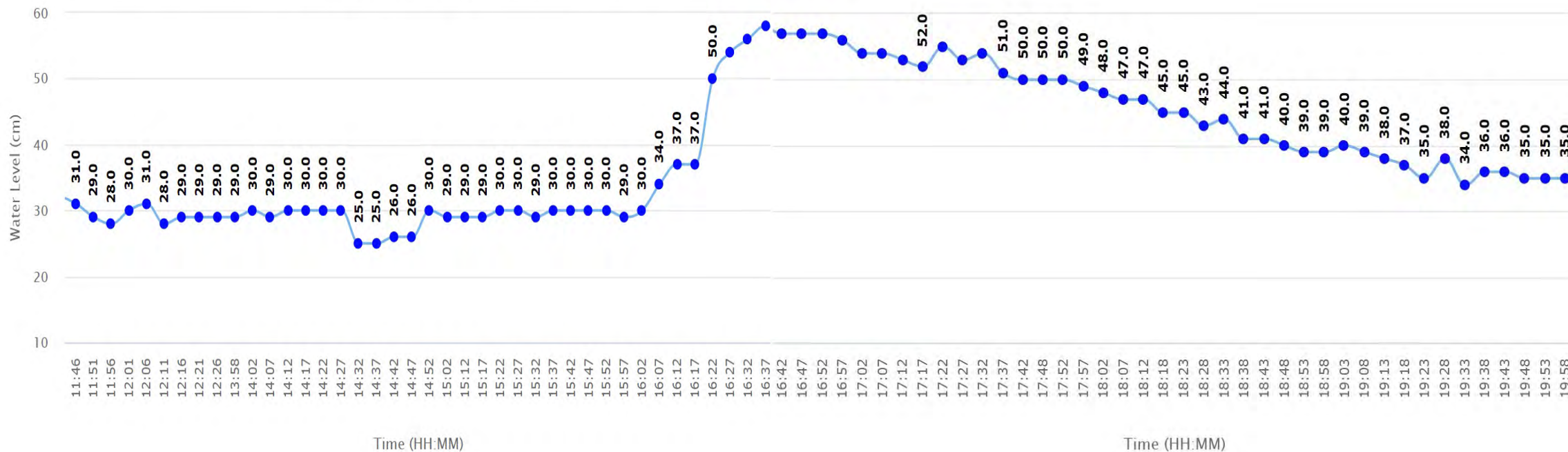


12 July 2018

Water level indicated by CBFEWS instrument

Water Level for CBFEWS: Rangoon river, Alital, Dadeldhura, Nepal OXFAM

Source Date: 2018-07-12



Yadab Bogati, Volunteer :

“I could disseminate the information to the communities and also received phone calls enquiring about the same.”

Bhim Bahadur Saud, President of Pashuram Municipality:

“The technology has helped to display information in board of Municipality and we were able to share it on time to save the life of people.”

Janaki Singh, a member of Parigau Women Empowerment Center:

“We informed each household members not to go to riverside, share the information to their family members. Everyone was alert and able to save life.”

Datta Ram Panday, in-charge of Illaka Police office Dadeldhura:

“Flood information of Rangoon Khola has helped us to mobilize the security forces the communities. Every year there used to be 3 to 4 casualties but this time, the technology has alerted us and helped us to be prepared.”

July 2019: Ratu River

4:15 76%
RATU CBFWS
Dipankar, Indu, Kanchan, Mahend...

Neera Didi

Flood Bulletin_10July_2019_...
13 pages · PDF 9:54 am

Mahendra Bikram Karki

continuous raining in lalgadh from night.....it may brings flood ...so stay alert 10:35 am

Till now there is no flood in ratu river... 10:35 am

Mahendra Bikram Karki

Level of river is raising ...stay safe and alert... 7:25 am

+977 985-1002704 ~Arun B Shrestha

Mahendra Bikram Karki
Level of river is raising ...stay safe and alert... (0:44)

Thank you Mahendra ji. Ratu looks really full. 7:32 am

Thanks Mahendra Ji, The water level seems rising. please do coordinate with Rajkumar and Ranjeet 9:34 am ✓

Ranjeet Ji, please followup with Mahendra Ji 9:54 am

Type a message

4:16 75%
RATU CBFWS
Dipankar, Indu, Kanchan, Mahend...

Mahendra Bikram Karki

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Type a message

4:17 75%
RATU CBFWS
Dipankar, Indu, Kanchan, Mahend...

Vijay Khadgi Dai
The peak in Bardibas was around 9am. Should probably start subsiding in sitamarhi soon! Hopefully 6:49 pm

Sanjay Yuganter
Reports are of bagmati having breached in Sitamarhi 6:50 pm

Sanjay Yuganter

Vijay Khadgi Dai
The peak in Bardibas was around 9am. Should probably start subsiding in sitamarhi soon! Hopefully

Yes, as per our discussion with Ranjeet half an hour back, water is moving downstream and as ground is dry, water my subside doing 7:09 pm

Just spoke to Ranjeet. The water is around 236 CM. The village safe. Some water has entered fields of ward no. 5. People are alert. Administraton has been identified. Ranjeet is responding spendledidly 7:26 pm

here is heavy rainfall...so be safe and alert... 9:53 am

I have contact to all the stakeholder about the situation ...Cdo,redcross! apf,journalist...it is hard to connect to rajkumar ji.. 9:53 am

Mahendra Bikram Karki

Water Level for CBFWS Ratu (Bhithamre Dam), Bihar India

Type a message

4:17 75%
RATU CBFWS
Dipankar, Indu, Kanchan, Mahend...

Sanjay Yuganter
in Ratu river at Srikhandi bhittmore, sursand block water has reached above 243 CM and is now overflowing from the breach that had occurred prior to in 2017. The water has entered ward 5 . Though people have taken precautionary measures due to early warning 9:49 am

Mahendra Bikram Karki
I am really worried for sarpallo, Jaleshwar and Bhiyamod....what is the situation right now...here we don't have electricity and network.... 9:53 am

here is heavy rainfall...so be safe and alert... 9:53 am

I have contact to all the stakeholder about the situation ...Cdo,redcross! apf,journalist...it is hard to connect to rajkumar ji.. 9:53 am

Mahendra Bikram Karki

Type a message

12:50 48%
RATU CBFWS
Dipankar, Indu, Kanchan, Mahend...

Ranjeet India

Mahendra ji abhi bardi bas ratu tiver ke bare me hame bataiye ki flood ka kaya isthiti hai 12:26 pm

Please infrome 12:27 pm

Mahendra Bikram Karki
Abhi Ratu me badh nai hai....lakin 9 am mai aaya tha....badha nai...but also stay safe and alert.....mai update karunga 12:31 pm

@Ranjeet India 12:32 pm

Ranjeet India
ok 12:32 pm

Mahendra Bikram Karki
Ok.. 12:32 pm

Ranjeet India
Rato river water level 244 cm 7:51 pm

Type a message

12:51 48%
RATU CBFWS
Dipankar, Indu, Kanchan, Mahend...

Mahendra Bikram Karki
Yes... 8:25 am

I am connected with mohattari update messenger group where message will be forwarded with 171 person along with CDO,POLICE,REDCROSS ,journalist, and community leaders... 8:34 am

Ranjeet India
rato river bhithamore flood in 218cm 8:31 pm

Stay safe and take care ranjeet ji 8:31 pm ✓

Ranjeet India
yes 8:32 pm

Mahendra Bikram Karki
Stay safe and take care @Ranjeet India ji..... abhi to lalgadh mai flood nai hai....anyway take care 8:33 pm

Ranjeet India
Ok 8:33 pm

21 JULY 2019

Neera Didi

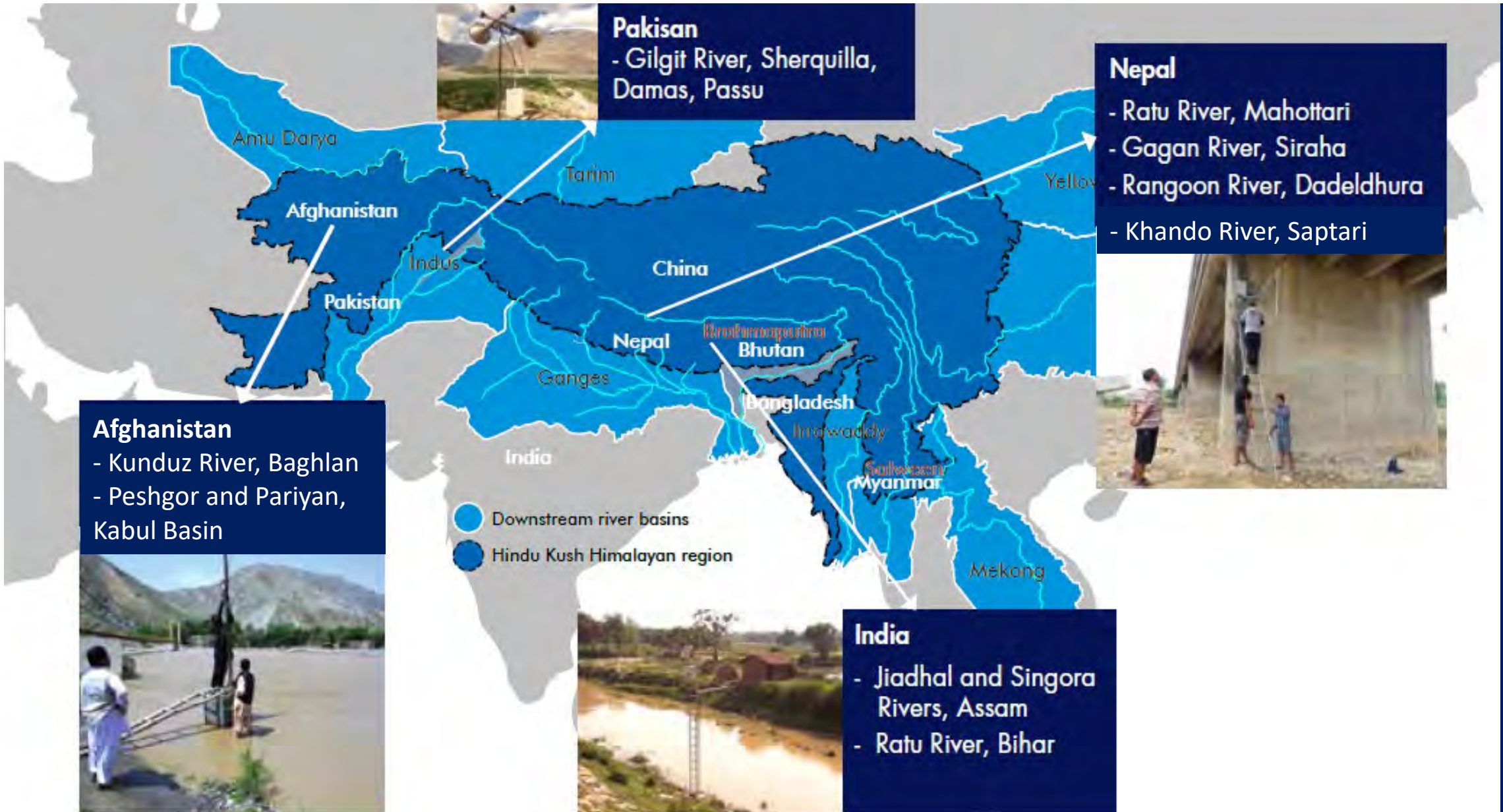
Type a message

Pakistan
- Gilgit River, Sherquilla,
Damas, Passu

Nepal
- Ratu River, Mahottari
- Gagan River, Siraha
- Rangoon River, Dadeldhura
- Khando River, Saptari

Afghanistan
- Kunduz River, Baghlan
- Peshgor and Pariyan,
Kabul Basin

India
- Jiadhal and Singora
Rivers, Assam
- Ratu River, Bihar



Take Home Messages

1. A diversity of technical, scientific, and institutional capacity exists in the region but needs to be utilized properly
2. There is a need for exchange of real-time information across national boundaries to increase the lead time
3. There are opportunities for sharing knowledge, experiences and know-how not only at national and regional, but also at local level



THANK YOU



Bittamore, Patna, Aug 2017



Bittamore, Patna, July 2019

We acknowledge the support by:



Australian Government



NORWEGIAN MINISTRY
OF FOREIGN AFFAIRS



SWEDEN

We are thankful to the government, local communities, NGO partners, and Sustainable Eco Engineering (manufacturer) for the successful implementation of CBFWS.

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Key discussion points

- Share your experience in your group on how do we address the above mentioned challenges and catch the opportunities for scaling up and scaling out for upstream-downstream cooperation on community based flood risk reduction and resilience building
- List at least 3 key priority strategies for upstream and downstream cooperation for community based flood early warning system