Community Based Floods Early- Warning Communications And Dissemination

A Case-Study from Nepal

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DRRM Specialist – 16 Oct. 2019

Flood in Nepal

- Flood is an annual phenomenon.
- Average annual rainfall of Nepal is 1500 to 2500 mm
- 80% of the rainfall occurs between June to September.
- Average human deaths per year due to flood is more than 80.
- Economic loss is equivalent to 1.5 million USD

Flood Management Approach

- **River Basin Approach**

  Upstream Monitoring

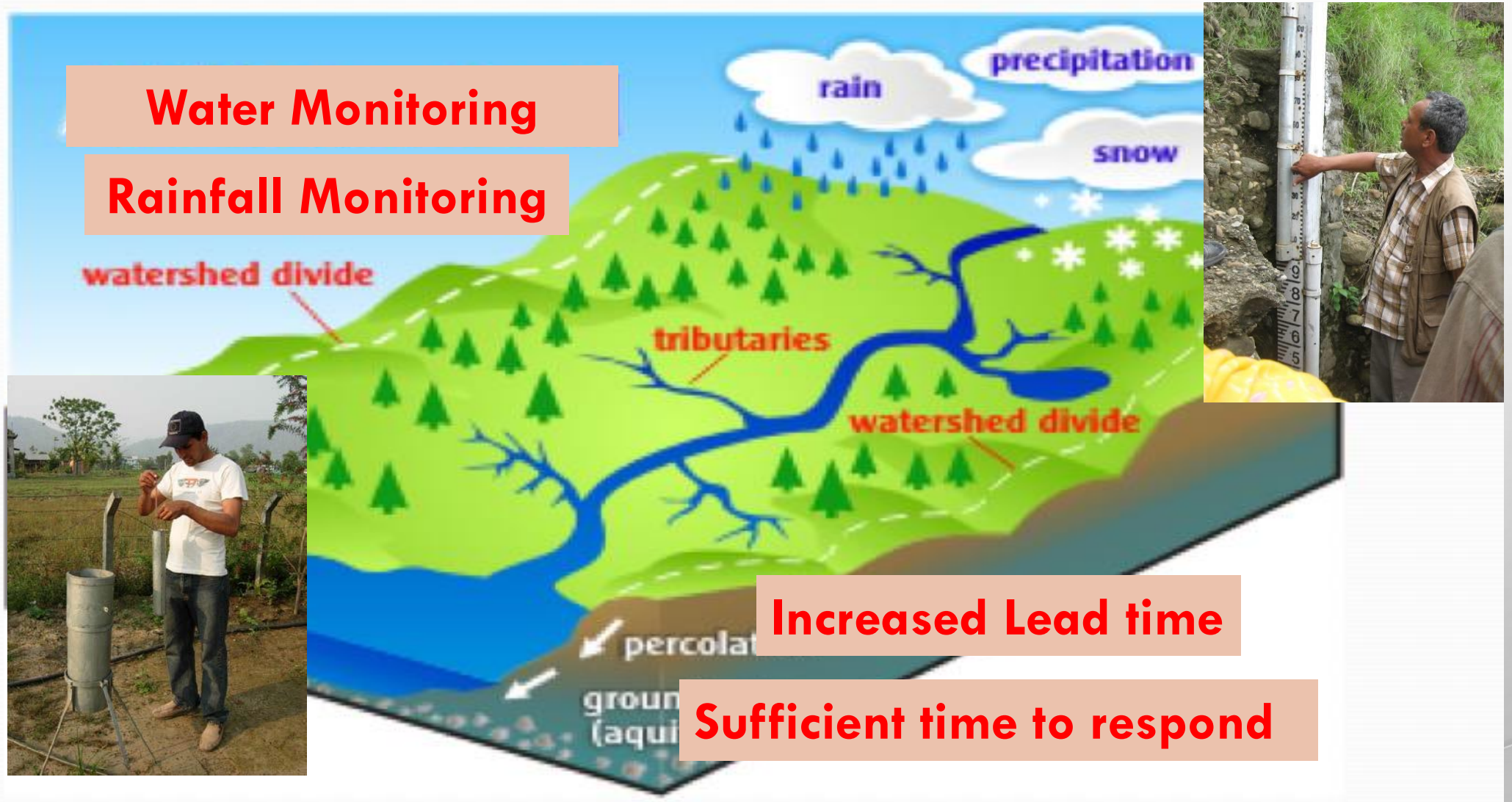
- **Real Time Telemetric**

  Taking Advantage of Mobile Technology

River Basin Approach

Water Monitoring

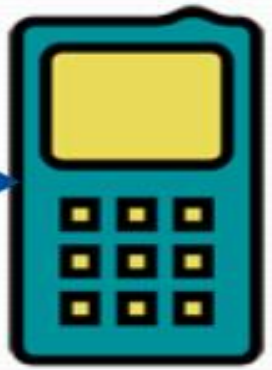
Rainfall Monitoring



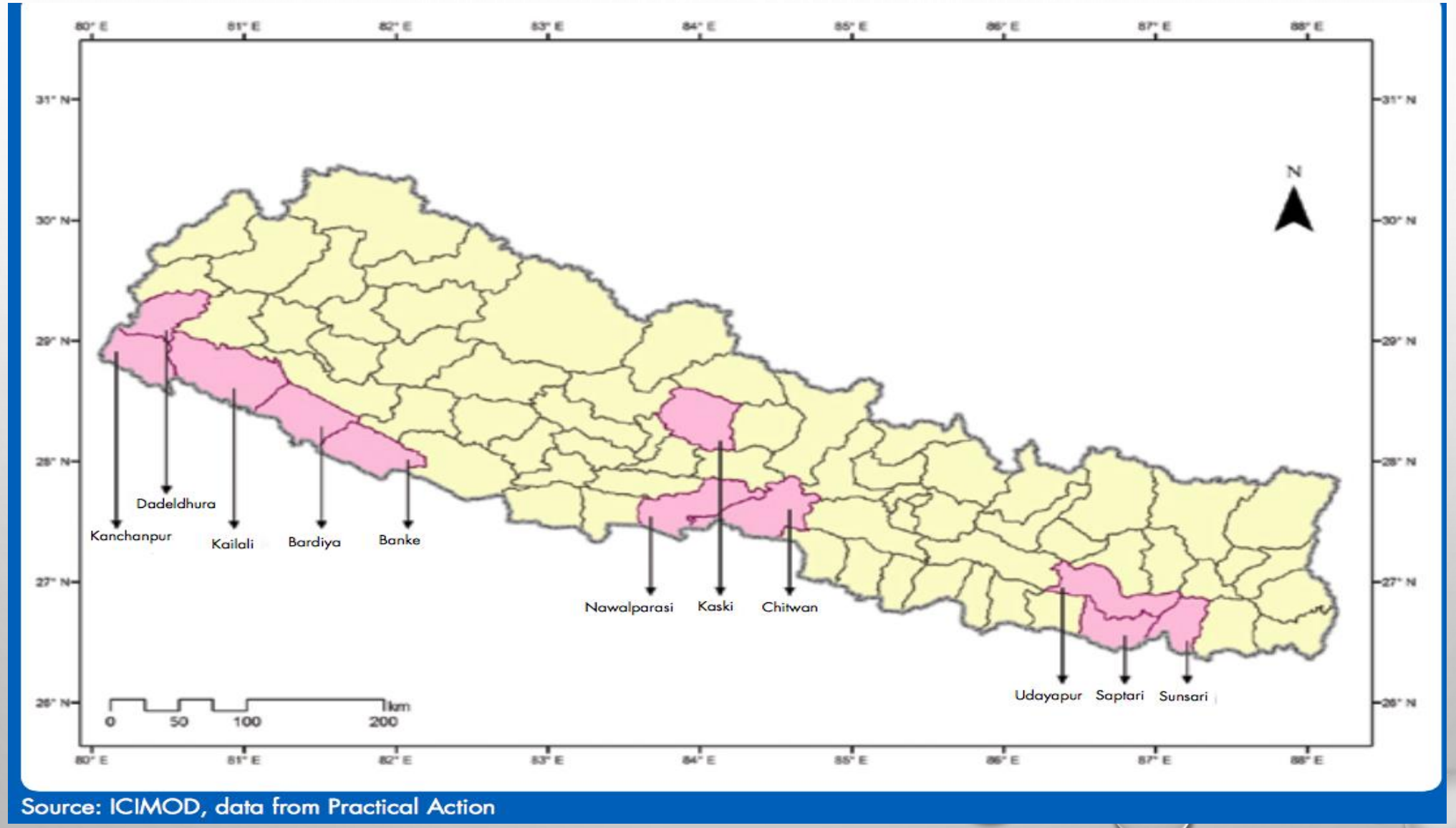
Increased Lead time

Sufficient time to respond

Real Time Telemetry (only started after 2000)



District With Community Based EWS

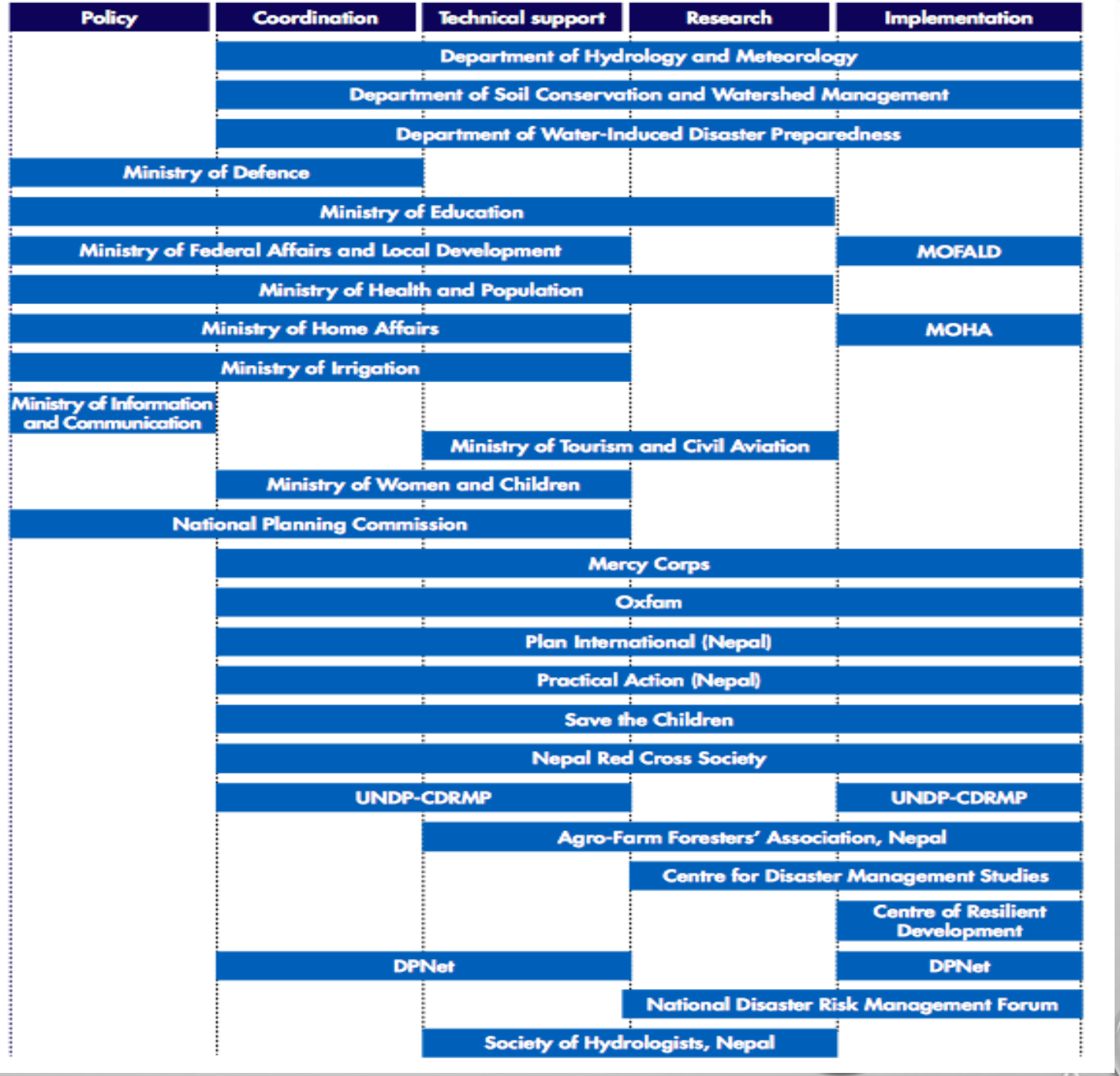


Source: ICIMOD, data from Practical Action

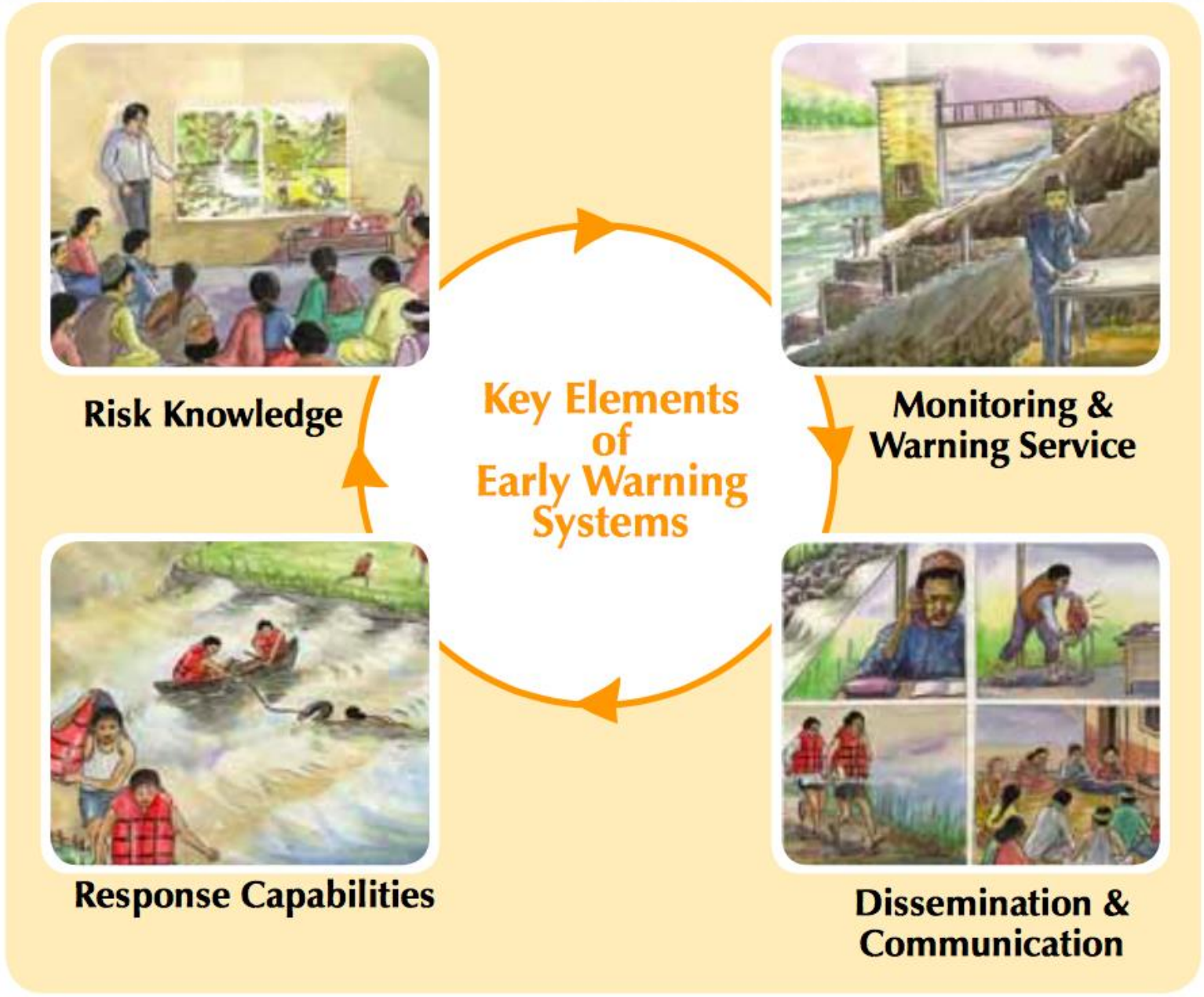
Implementation Framework

- **Ministry of Home Affairs (MOHA)**
  Response and Coordination, Rapid Assessment
  Communication and Dissemination of Information
- **Ministry of Federal Affairs and General Administration (MOFAGA)**
  Preparedness, Capacity Building and Knowledge Management
  Community Support to Response and Assessment
- **Department of Hydrology and Metrology (DHM)**
  Monitoring and Observation of Meteorological Information
  Communication and Dissemination
- **Media And Private Sector**
  Communication and Dissemination

Roles And Functions of Different Organizations in Disaster Risk Management in Nepal



FOUR KEY ELEMENTS OF 'PEOPLE CENTERED' EWS



Components of a Flood Early Warning System

Vulnerability

Warning decision

)issemination and communication

Radio

Mobile

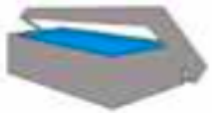
Community warning

Response capability

Evacuation centre

Search and rescue

Relief goods

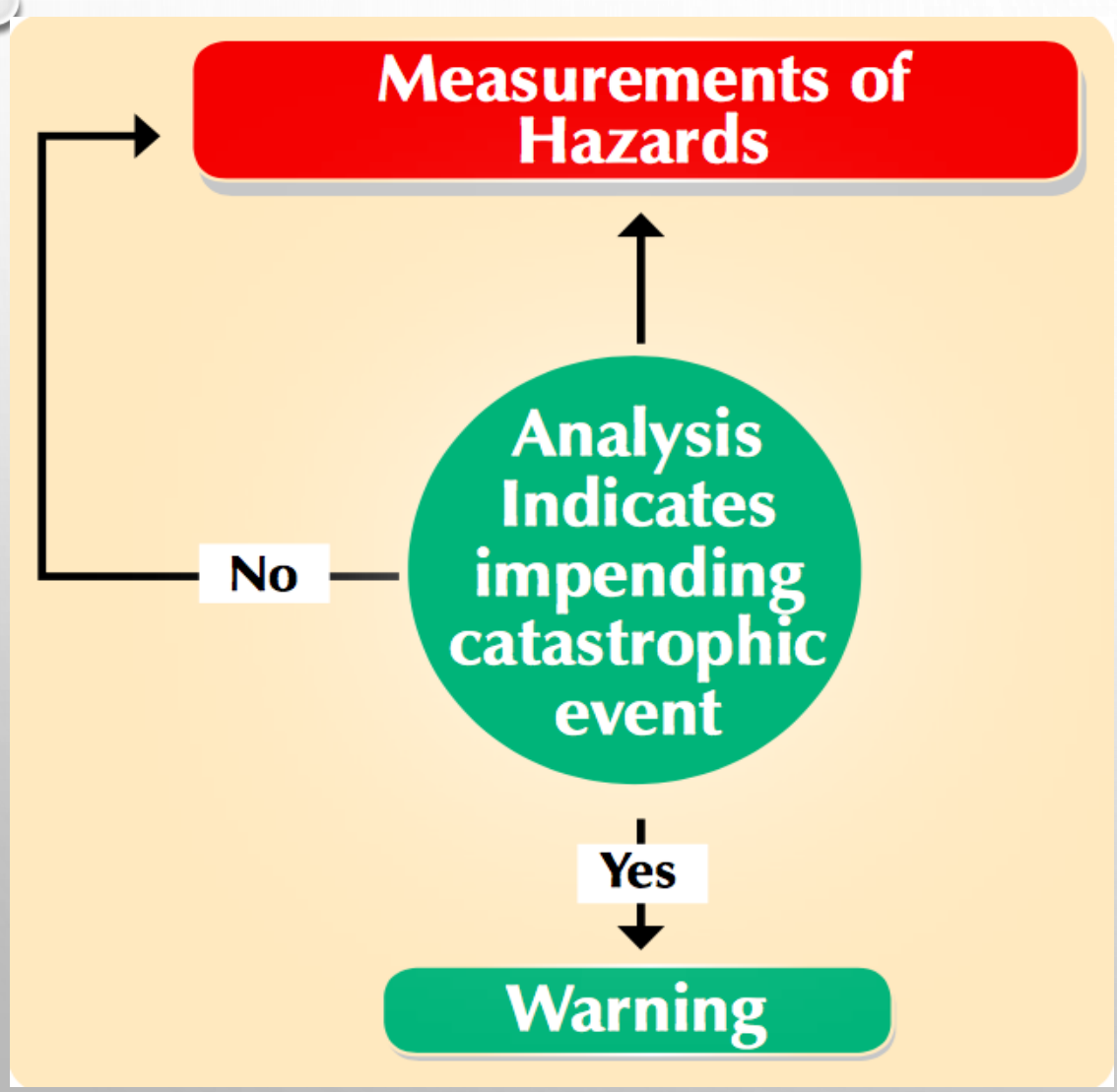


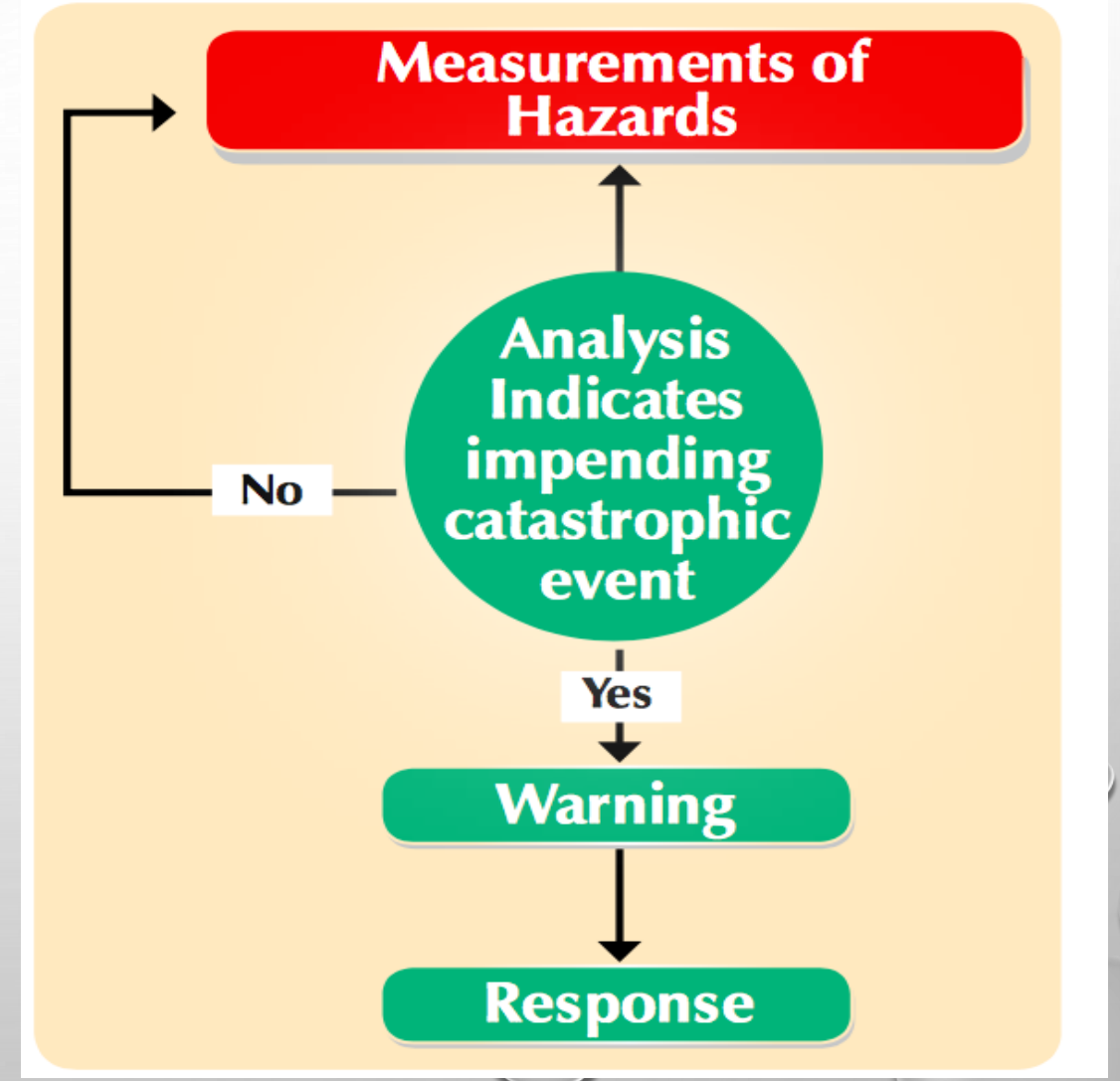
Source: adapted from Neussner (2009)

End to End Solution

Hazard detection to Community response

Traditional Vs Four Phases EWS

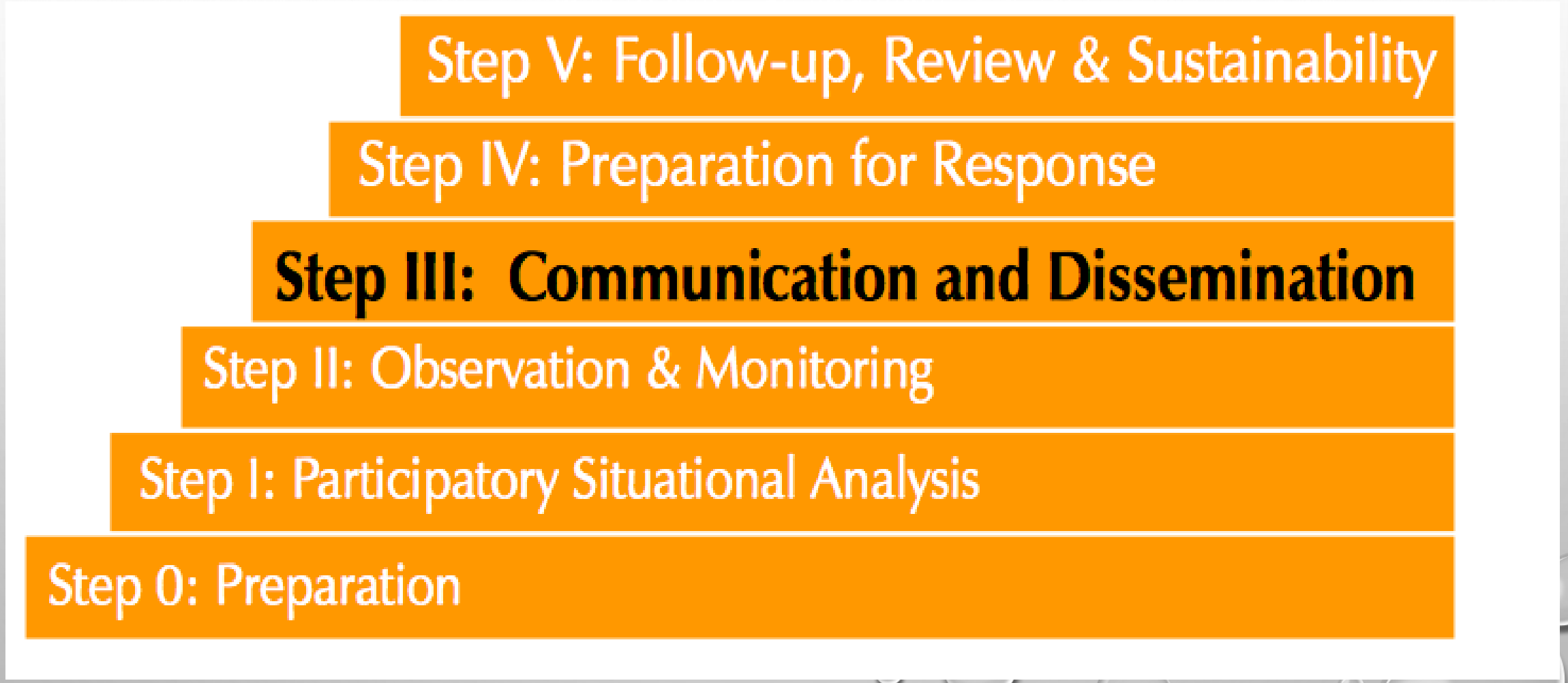




Community Based EWS

- A system designed, operated and maintained by the communities.
- Community will explore external support from different individuals, communities, organizations and institutions.
- Community develops and maintains close coordination and links with different stakeholders.
- Community will lead all steps of establishment of the EWS.
- Community should own and contribute to the sustainability of system.

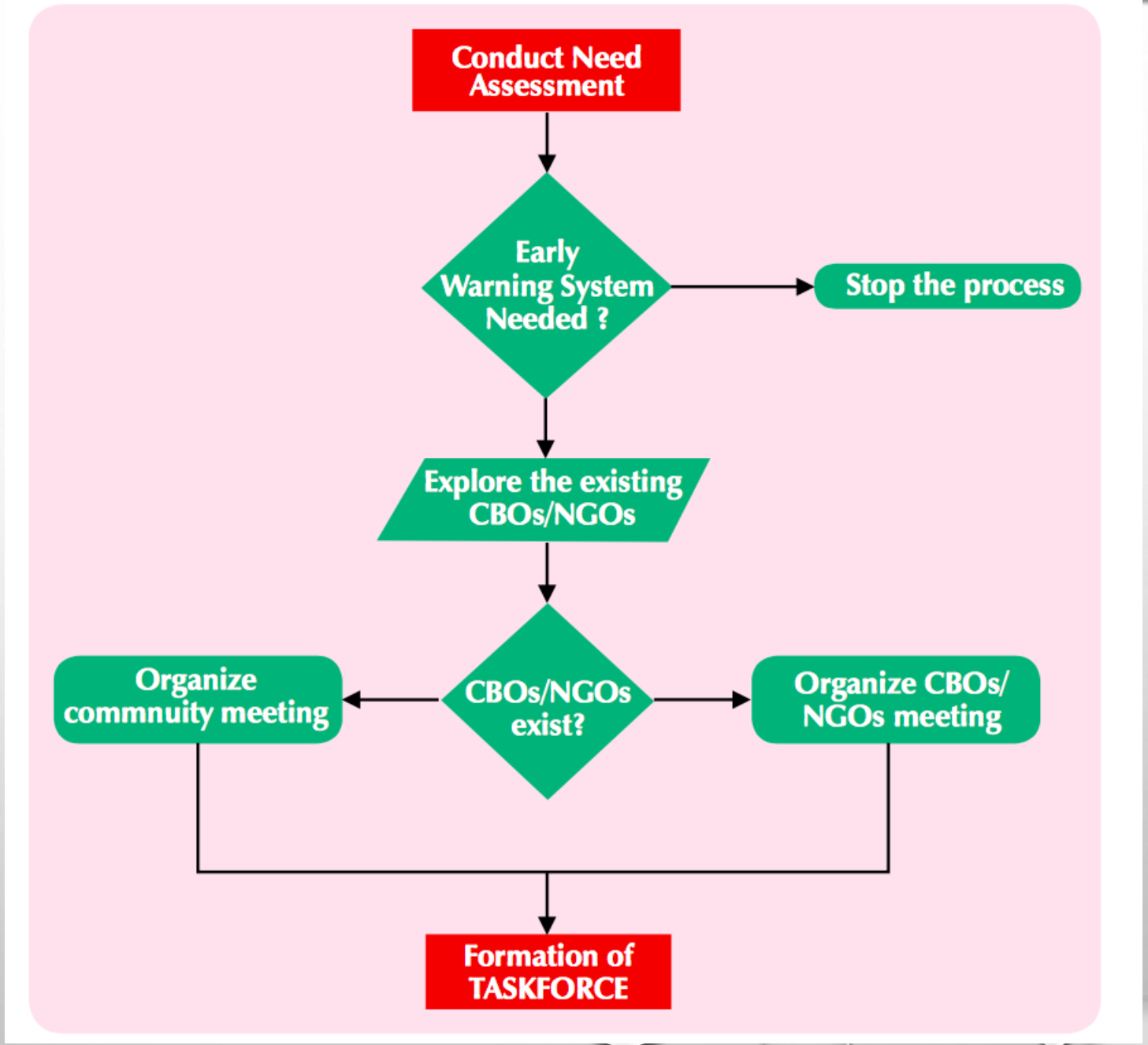
Five Steps of Community Based EWS



Step 0 - Preparation

- Ensure that the establishment of EWS will mitigate the problems.
- The basic information should be collected in consultation with the community.
  - Frequency and severity of past hazards
  - Spatial characteristics
  - indigenous EW practices
  - vulnerable households and groups
  - existing social groups
  - capacity of the community
- Information analyzed and decision made (with the community) - whether establishment of an EWS will reduce the vulnerabilities of the community.
- The major criteria used are:
  - Frequency of hazard, Severity of hazards, Availability of sufficient lead time

The Preparation Process



Step III- Communications and Disseminations (C&D)

- Making warning prompt, targeted and informative; before, during & after emergency
- Communications from the right place, on the right time and to the right people.
- Follow principle of 'live and let them live' By Members and leaders of up and down stream, and flood prone community.
- Actionable Warning – likelihood impact
- Reliable and well organized
- Agreement on flow of information
- Understand by all stakeholders
- Effective & efficient to reach all end users
- Offer alternative methods/channels
- Use of different modes
- Local traditional system – relevance, effectiveness and feasibility
- Develop 'Community Communications Network'

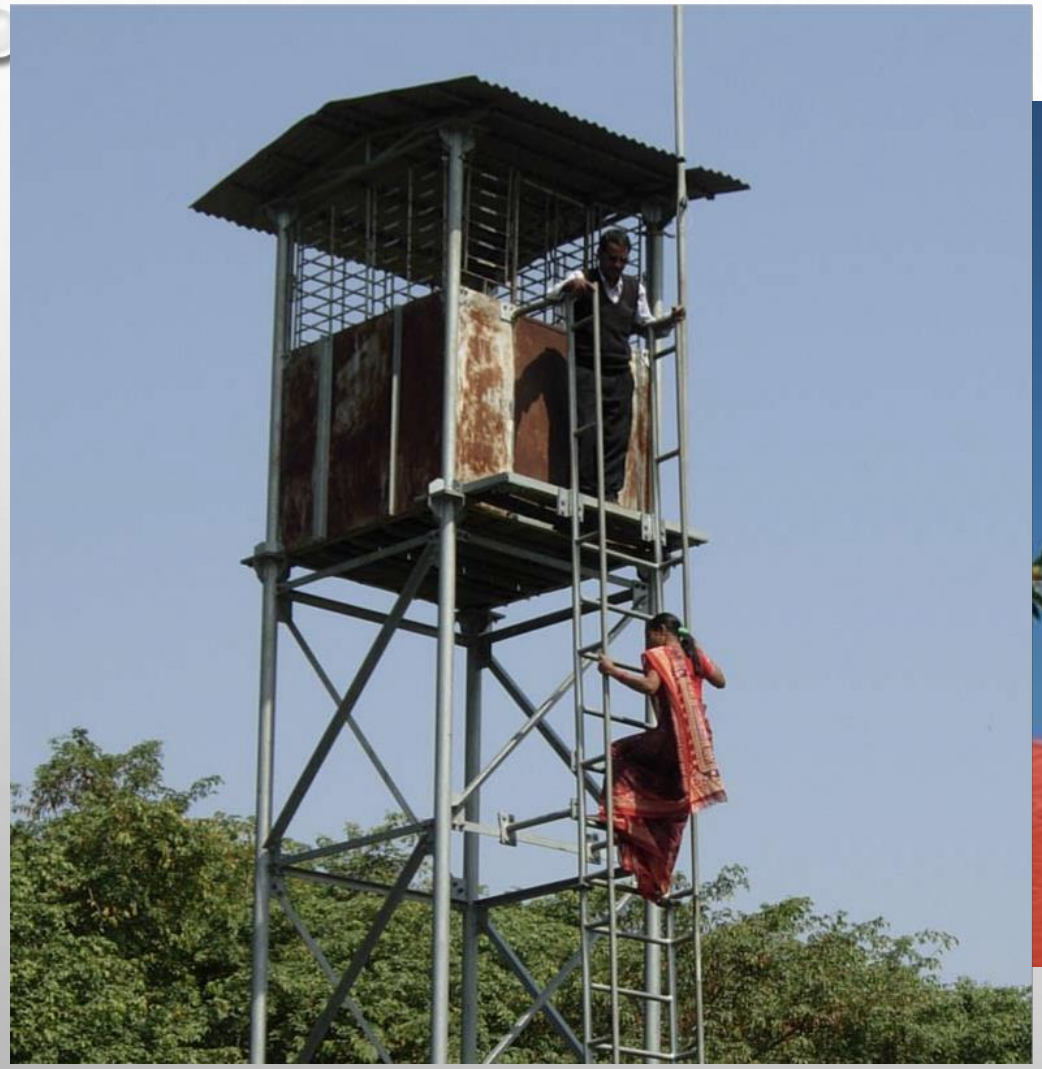
Steps to develop a C&D System:

- Identify existing C&D systems
- Identify the mechanism and medium for C&D system based on the information and level of risk
- Develop C&D plan with technical support from the concerned organizations.
- Identify roles and responsibilities of each stakeholder.
- Take into account the special need of selected community members (including hearing, visual and mentally impaired persons).
- Supply and install C&D tools and equipment. Prepare their O&M plan.
- Share agreed C&D plan to all community members and stakeholders. Develop inclusive IEC materials as per local need for awareness.

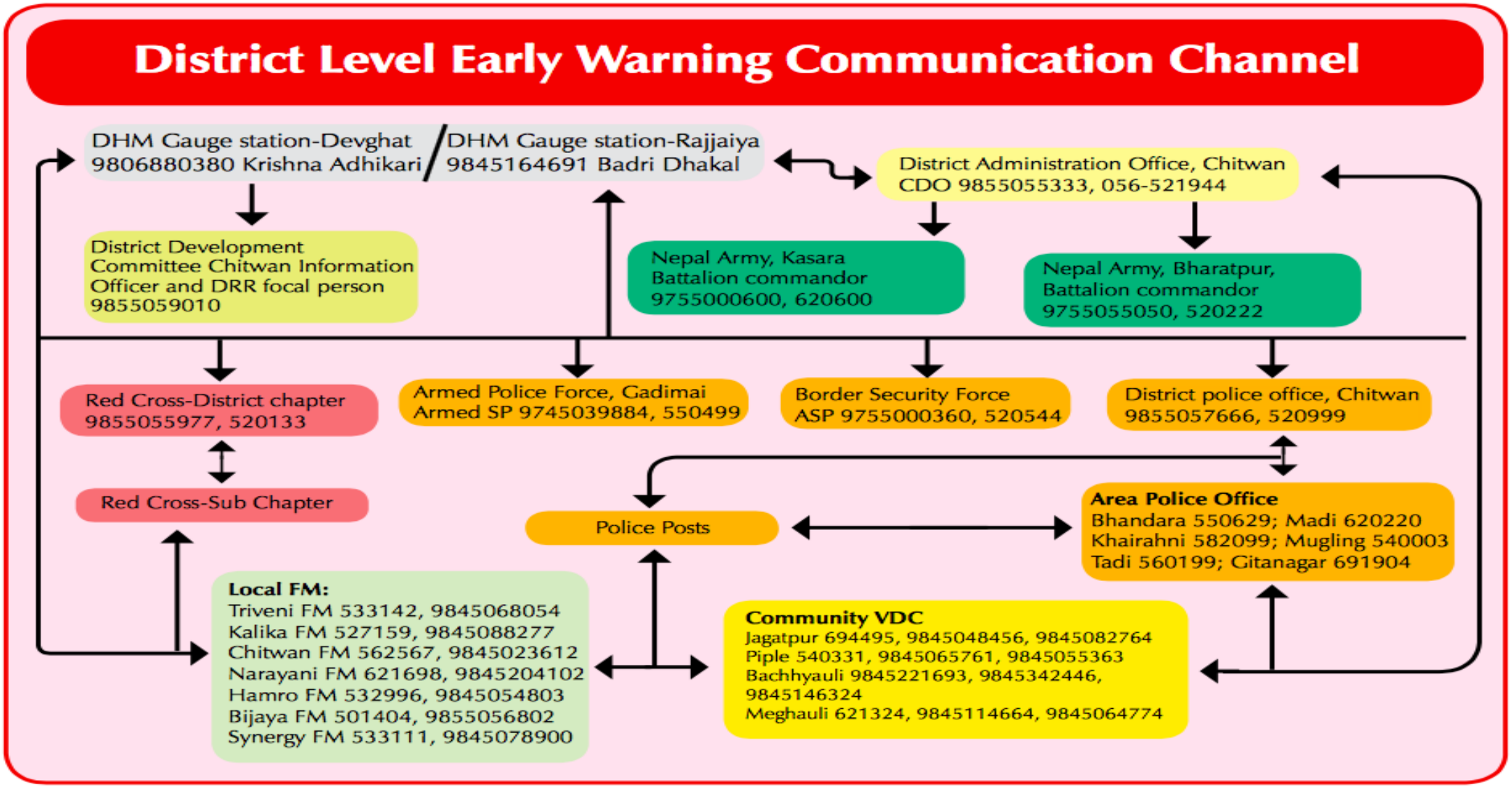
Tools and Equipment

- Telephones
- Wireless radios
- Sirens (hand operated)
- Colored flags/light
- Hand mikes
- FM radio and television stations
- Social Media
- Websites
- Traditional methods

Examples of C&D



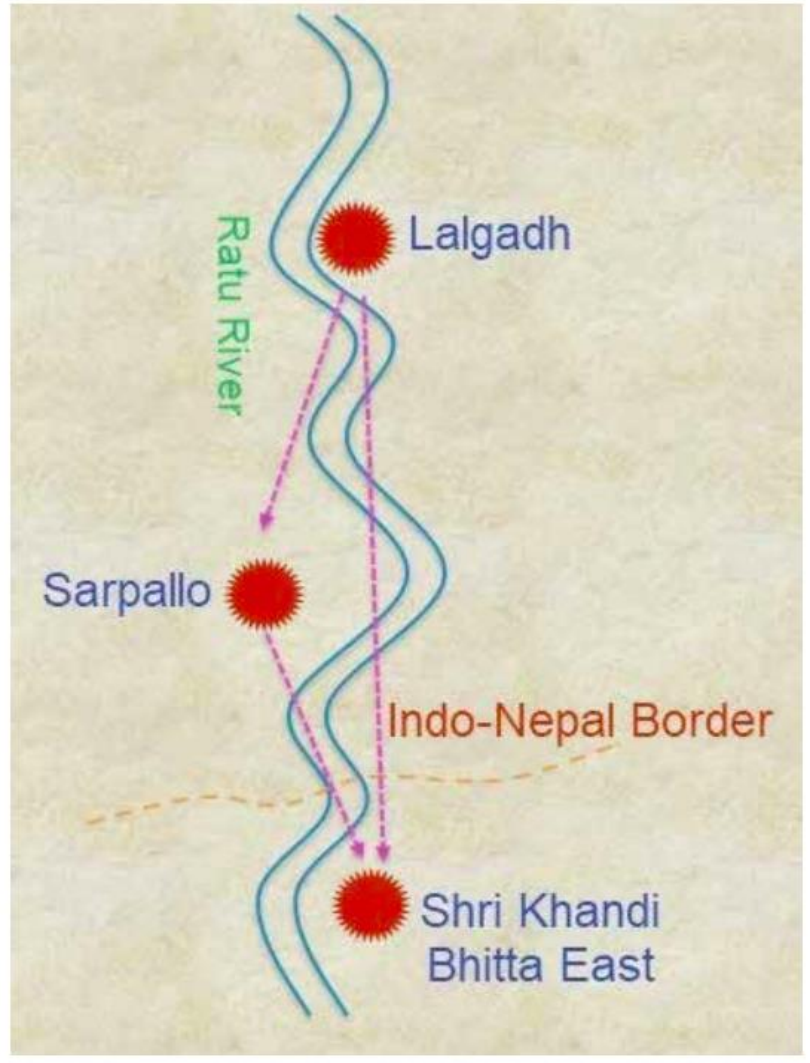
Communication Channel



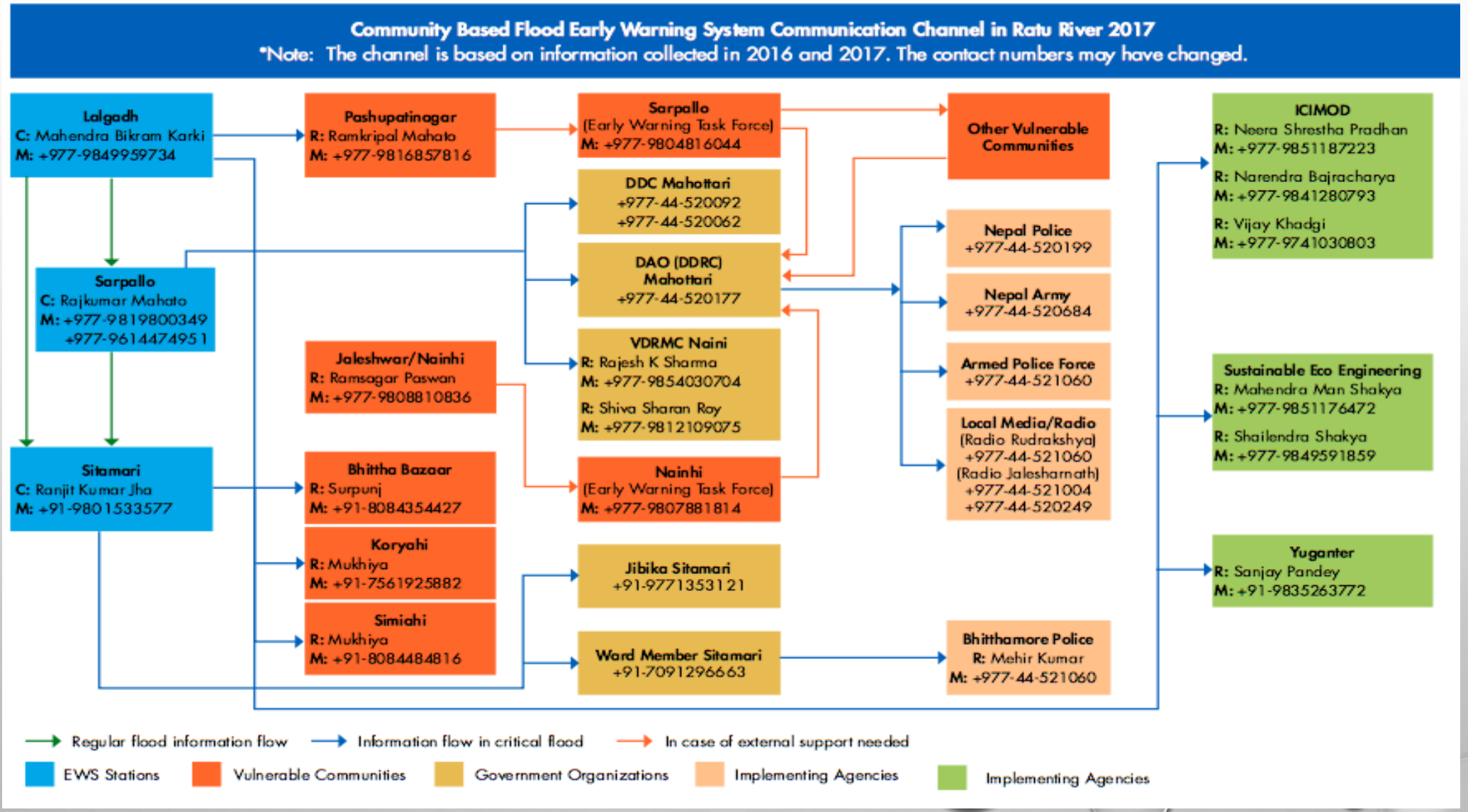
Levels of Warning and their Interpretation

UPSTREAM			DOWNSTREAM	
Warning Level	**Color of Data indication**	**Siren signal**	**Interpretation**	**Action**
Level 1		No siren	High probability of flood	Stay alert and on the standby
Level 2		Beeping sound	Flood is inevitable in a few hours	Be prepared
Level 3		Continuous ringing	Flood is coming	Evacuate for safety

Information Flow- Ratu River



Communication Channel – Ratu river



Kankai River Flood Early Warning Communication Channel, Jhapa

Nepal Government
District Administration Office, Jhapa

Department of Hydrology and Meteorology
Flood forcasting Section, Toll free No. 1155
www.hydrology.gov.np
Mainachuli, Hydrology station
Bimala Rai - 9816059377

District Emergency Operation Center
Ph. No. : 023-457123
District Administration Office, Jhapa
Chief District Officer
Mob. : 9852617777, Ph. : 023-455166

Nepal Army Charaali, Barrack
Chief of Nepal Army
Mob. 9852655788 Ph. : 023-460080

Nepal Red Cross Society
Jhapa District Chapter President
Mob. : 9852672698, Ph: 023-520102

District Development Committee
Jhapa
Local Development Officer
Mob. : 9852671072, Ph: 023-455084

Armed Police Force B.S.O., Jhapa
Chief of A.P.F.
Mob. 9851272101, Ph. 023-520235

District Police Office, Jhapa
Chief of N.P.
Mob. 9852615555, Ph. 023-455100

Nepal Red Cross Society Sub-Chapters
Surunga - 9852674454
Saranamati - 9804937257
Kumarkhod - 9806075616
Shivasatakshi - 9814950050
Panchangachhi - 9842629882

Local FM Stations
Kanchanjanga FM - 023-442612
Mechi Tune FM - 023-563266
Pathivara FM - 023-584604
Aarambha FM - 023-445017
Aagan FM - 023-545660
Sunrise FM - 023-540422
Nagarik FM - 023-520272

Armed Police Force Pathivara Battalion
Lakhanpur - 9852053022
A.P.F. : Baigundhura - 9851258518
A.P.F. : Kumarkhod - 9851258570

Area Police Office & Police Station
Surunga - 9852090064
Shivaganj - 9862682681
Kumarkhod - 9852690059
JhilJhile - 9852683645
Mahavara - 9862133034
Saranamati - 9814989734
Korobari - 9815775355

Local Disaster Management Committees
Kankai - 9852678244
Saranamati - 9862682969
Tagandubba - 9842629554
Kumarkhod - 9804953455
Shivasatakshi - 9852660134
Panchangachhi - 9862673885
Mahavara - 9801402572
Korobari - 9842653219
Danabari (Ilam) - 9842060843
Mahamai (Ilam) - 9852636333

EWS Task Force of Target Communities (Co-Ordinators)

Sugabathan - 9815054552	Bhakurmari - 9806068827
Tappubasti - 9815031243	Titrigachhi - 9817002005
Milanbasti - 9824043188	Hokalbadi - 9807901178
Nayabasti - 9844643581	Birkhebasti - 9814919147
Tribenitoll - 9817097216	Hemnadangi - 9817937903
Shukumbashibasti - 9816982844	Kichakdangi - 9804979858
Toplalbasti - 9808288426	Uraubati - 9816950698
Purano Bazar - 9817000452	Hawaldarbasti - 9807967308
Bajretar - 9817926497 (Ilam)	Paltar - 9862678859(Ilam)
Laxmibandh - 9823295307(Ilam)	Dhodre - 9815945935 (Ilam)

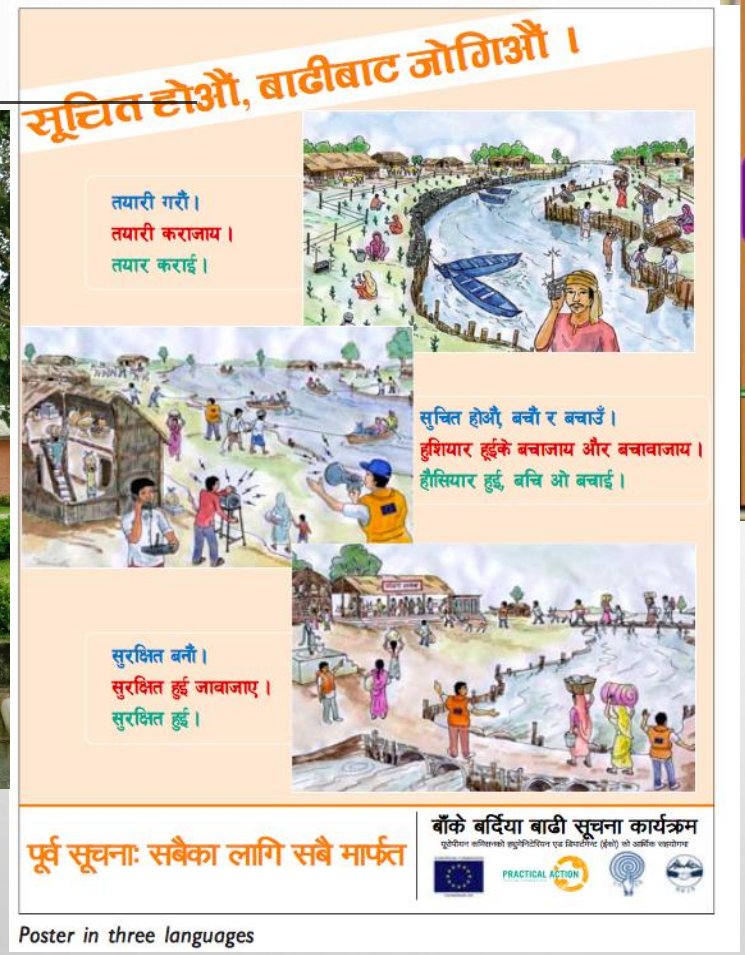
USAID
FROM THE AMERICAN PEOPLE

Nepal Red Cross Society, Jhapa

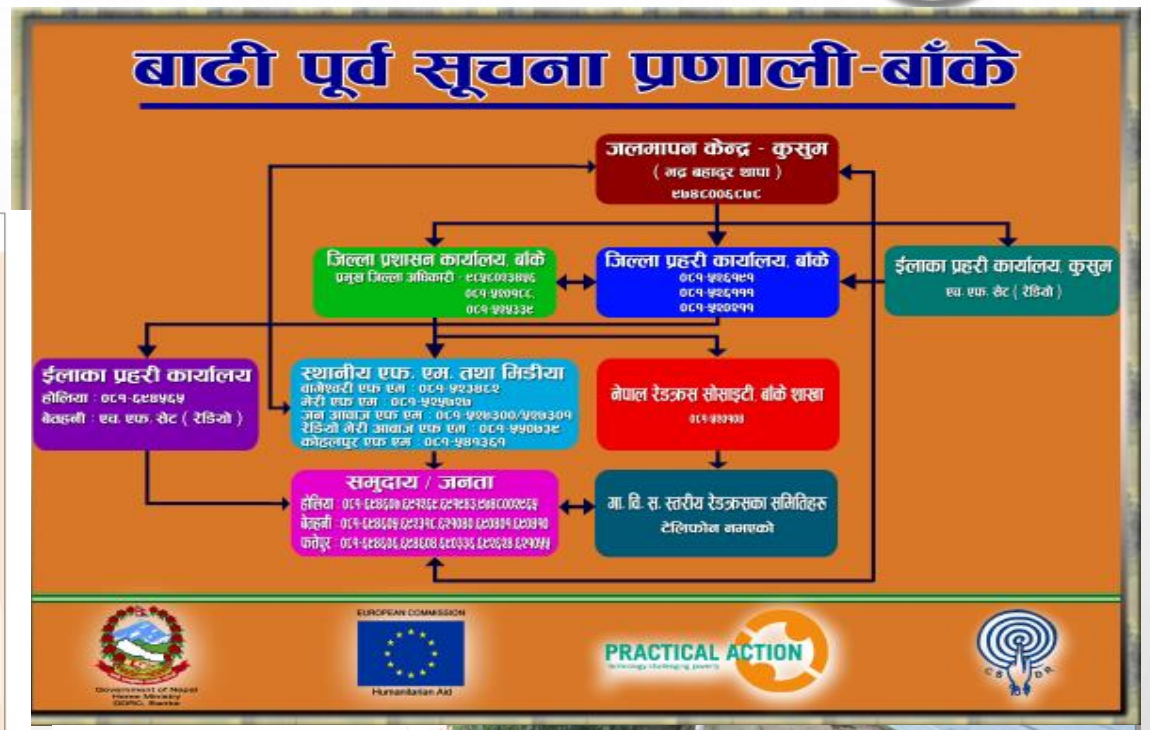
PRACTICAL ACTION
Technology challenging poverty

After EW – People evacuating-rescuing elders and children

Examples of C&D



Poster in three languages



Recognizing and Understanding Warning Messages

- Information should be short, clear and understandable
- Common understanding - EW system, Warning level and Communications channels
- Write-down the messages once received
- Ask to repeat to verify and confirm the message

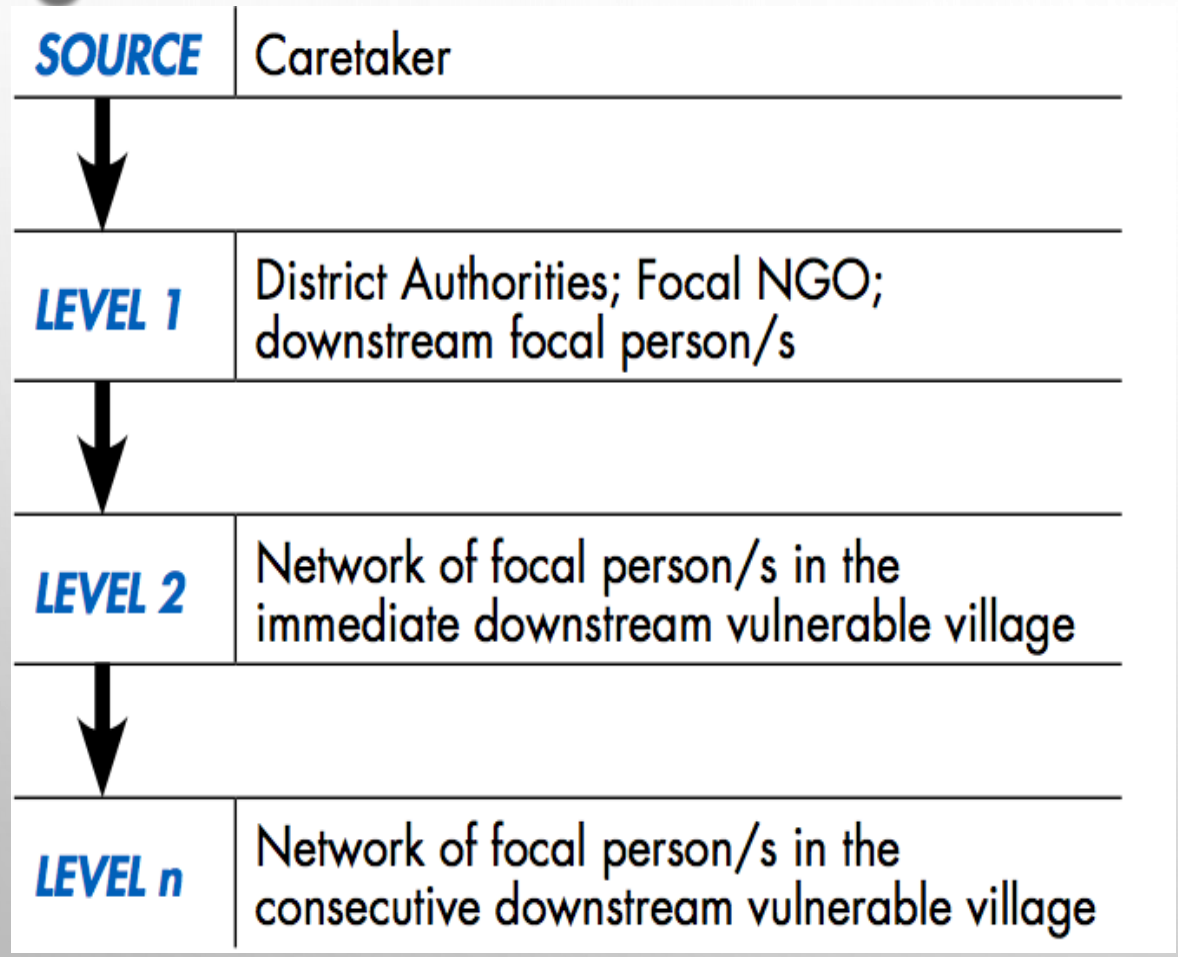
Examples of Signals

Warning Level	Level 1 Alert, Standby "Ready"	Level 2 Preparation "Get set"	Level 3 Evacuation "Go"
Precondition	One sound of the siren, long pause (repeated)	Two consecutive sounds of the siren, long pause (repeated)	Continuous sounds of the siren
For the person with the hearing impairment*	Green flags/lights	Yellow flags/lights	Red flags/lights

C&D Levels

- Upstream (gauge station) to community
- Within community
- Community to Community

Level of Recipients of EW



Key Actors of EWS

- Caretaker
- Local Organizations – LG, Line Agencies, FP
- Local Disaster Mgt. Authority
- FP Downstream vulnerable village
- Local Media
- **Flood Risk Management Committee**
- Other Actors – Private sector, Red Cross, Police and Army, local leaders & teachers

Capacity Building

- Conduct Capacity Needs Assessment. Consider following common approaches targeting the local communities and other key stakeholders:
- Training
- Awareness raising (IEC material - posters, flayers, pamphlets, videos, street drama, door-to-door)
- Learning/Exposure Visits
- Equipping with relevant facilities
- Ensure System Operator has relevant knowledge and skills of C&D, and maintenance of the equipment. Main target audiences are:
  - Gauge observers Community leaders,
  - EW Management Committee members, Media and other stakeholders.

Interaction with LDMC and DDMC on EWS

EWS Training of Disaster Management Committee members.

Content of Capacity Building

- Identifying and analyzing the C&D channels
- Define roles and responsibilities of all key stakeholders
- Use of C&D medium
  - telephones
  - sirens (hand operated)
  - hand mikes
  - social media
  - wireless radios
  - colored flags/light
  - FM radio and TV stations
  - Website
- Maintenance of the tools and equipment
- Team building (up/down stream community, flood prone communities, other community members, Media)
- Effective communication skills

Challenges

- Bridging the gap between those with information and those who do not
- Inadequate comm. systems to provide timely, accurate & meaningful infor.
- Lack of alternative channels to ensure outreach of information
- Poor quality of tel. systems and technology
- Lack of clarity in warnings issued
- Inadequate understanding of vulnerable groups and their needs
- Ineffective engagement of the media and private sector
- Failure of equipment
- Lack of community's trust in the information disseminated
- Obstruction in dissemination of information due to social structure
- Frequent movement of youngster
- Absence of user friendly tools and equipment
- Limited knowledge of alternative communication channels

Challenges (Contd.)

- Conscious blending of indigenous knowledge and modern technologies
- Media role - mere informer to making community listen
- Mis-use of social media (rumor)
- Limited engagement of local government – protocols of C&D system
- Lack of standardized SOP on flood EW C&D
- Shifting to response centric to disaster preparedness
- Failure to understand the gravity of hazard and vulnerability

- Effective institution and governance
- Sustainability of the system- LG ownership
- Affording use of advance technologies
- Improved regional and transboundary collaboration
- Anticipate flood and be better prepared
- Use of EW information in re-building and recovery
- Verified location-specific information directly to the community
- Project based approach

Discussion on Strengths, Weaknesses and Gaps in Communicating Flood Early Warning

Nepal

Description	Strengths	Weaknesses	Gaps
Hydromet services			
Generation of early warning and flood forecasting models			
Flood Forecasting Models	• Confidence and accuracy; • Understandable; • Linked with DMA	• Difficult for non-technical people to understand; • Uncertainty in rainfall forecast; • Limited trained human resources • Inadequate ICT	• National and basin level rainfall forecasts for flood forecasting
Global models	• Increased lead-time for early action; • Free of cost; • Node can be added at any place	• Less accuracy; • Dependency on others	
Products and packaging of early warning for dissemination			
Flood bulletin	• Strong lifesaving message; • Means of preparedness	• Limited to certain groups (email users only)	
Advisories	• Easy to self-plan, very helpful in harvesting and planting crops		
Means of communication, language and frequency	• Followers of social media (Facebook and Twitter) reaching out to larger groups	• Only in Nepali language-local language • Not accessible or limited to end users	• Local language
Mechanism of feedback?	• Toll-free number and social media for feedback	• Limited social media users	
Transboundary early warning	• Community-community linkage social cohesion	• No data sharing between Tibet (China) and Nepal • No institutional/ governmental linkages	• No policy on transboundary EWS

Discussion on Strengths, Weaknesses and Gaps in Communicating Flood Early Warning

Disaster management authority			
Dissemination of early warning, who are the recipients?	• Extend institutional structures up to community level (TFs and CDMCs); • Local governments in place	• Area coverage is limited (project based only); • Limited awareness; limited capacity of local governments and end users	• Sustainability
Coordination between various agencies and end users	• Coordination and collaboration among all stakeholders	• Limited project-based area coverage	• Community underrepresented in district level mechanism
Means of communication, language and frequency: SMS, phone, media, website	• Social media (Facebook and Twitter) – reaching out to larger groups; • Toll free #, website with visual displays, twice a day in monsoon as and when required; • Maps, texts and graphs	• Limited to certain groups (email users only); • Limited internet service: solar power backup	
Civil society, research organizations			
Community awareness and capacity building	• Community level structures (TFs and CDMCs); • Training on CBFEWS	• Limited or project based; • No clear policy on roles of the local government	Continuity
Coordination among various agencies and end users	• Strong mechanism all the way up to community level; • Increase in number of supporting agencies	• Lack of effective coordination among stakeholders	• Institutional relations lacking
Means of communication; language and frequency	• HF radio set; • Community level TFs	• Limited to DEOC (around 56-573 local agency)	• Project-based operators
Addressing gender and differentiated vulnerabilities	• Gender focal points		

Way Forward

Technical

- Nation wise multi-hazard risk assessment mapping (basin and sub-basin);
- Atomization of hydro-metrological stations
- Expand the telecom network to all places;
- Inclusive technology (visible, sound and signage) for dissemination of information;
- Alternative means of communication (VHF, radio - wave/satellite based);
- Use of social media and mobile apps;
- Capacity building up to local level
- Risk Based Warning and Impact based forecasting

Institutional/Governance

- Formulate FEW guidelines in line with the existing act, policy, and SAP;
- Integrated approaches to multi-hazard risk assessment mapping (basin and sub-basin)
- LGs ownership of existing monitoring stations and establishment of new ones;
- Vertical collaboration between institutional setups and EWS system NEOC to LEOC;
- Proper communication channels (vertical and horizontal);
- Institutionalize task forces (EWS, search & rescue, first aid.) In LGs
- Forecast based Financing
- Clarity of treaties with India and China

Socio-Cultural

- Diverse messages reaching diversified target audiences: language, social norms and values;
- Integrate social and cultural norms in stations establishment and capacity strengthening of most vulnerable;
- Gender sensitive response actions
- Tailor to diversity
- Guided through one door system
- attract local government's budget and allocate budget from all government levels

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shukran
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Danke sehr
Дякую
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Mh'gôi
diolch
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