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Climate Change and Disaster Risk Reduction : Space Technology Initiatives, Challenges and Opportunities

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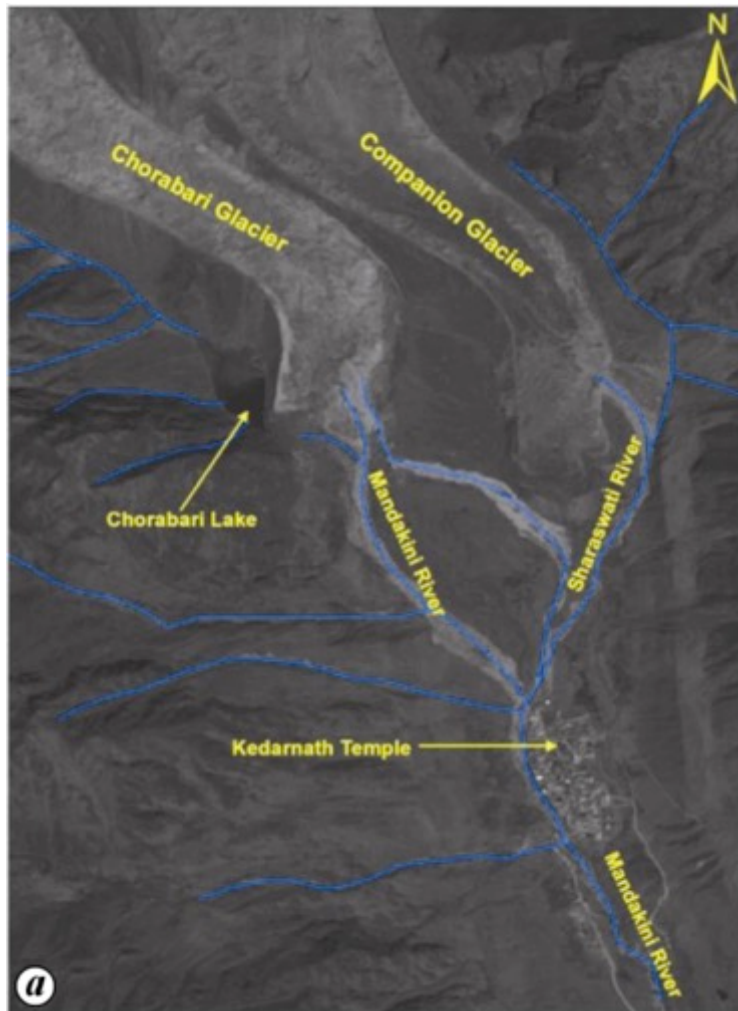
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Uttarakhand Floods 2013





2013 North India floods (Kedarnath)



- **Climate extreme**

- Torrential rainfall - alike cloud burst
- Rapid melting of snow
- Formation and expansion of moraine dammed lakes
- Chorabari lake outburst

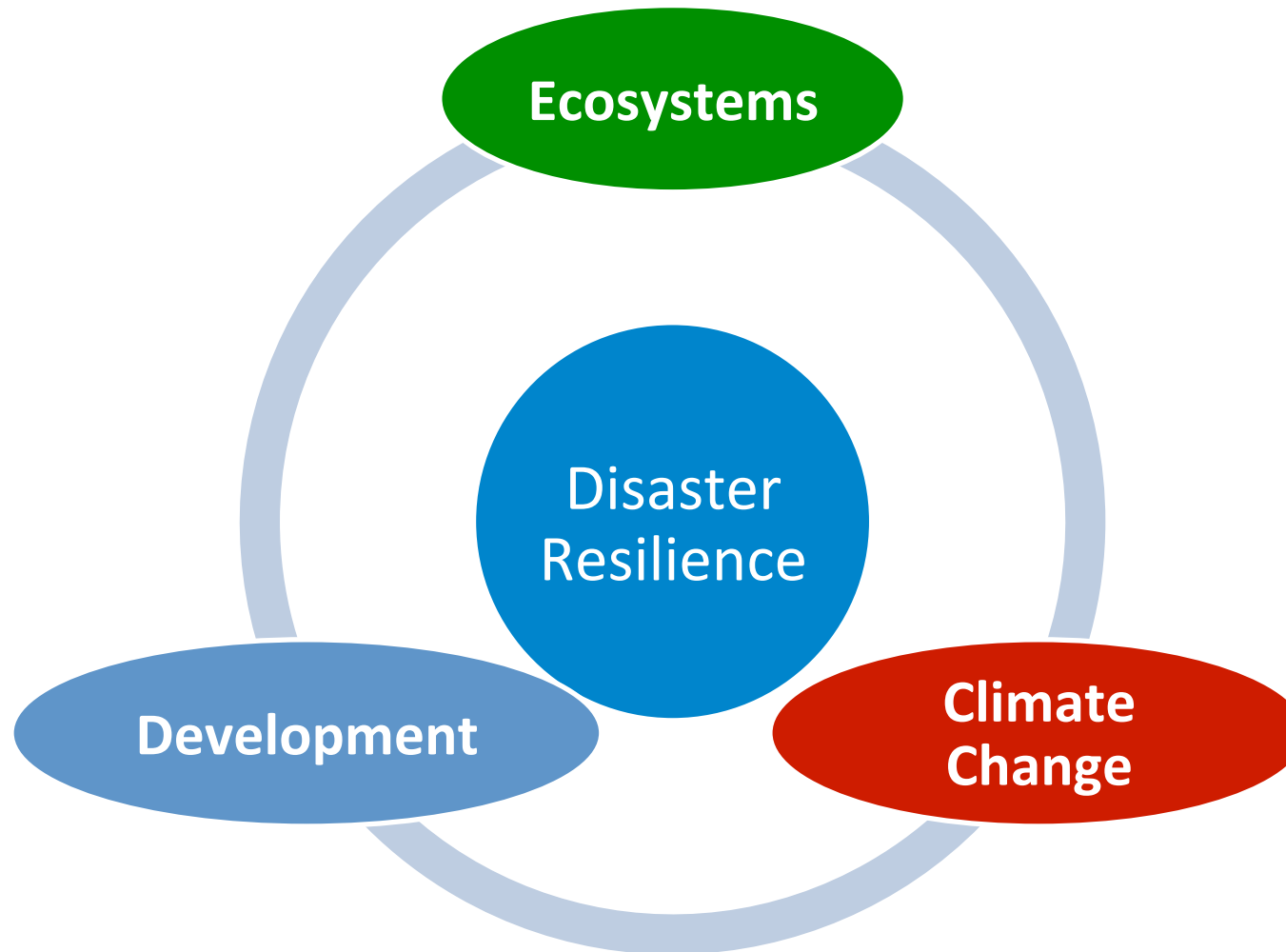
- **Human induced factors**

- Vulnerable human settlements
- Weakened ecosystems triggering mudslides

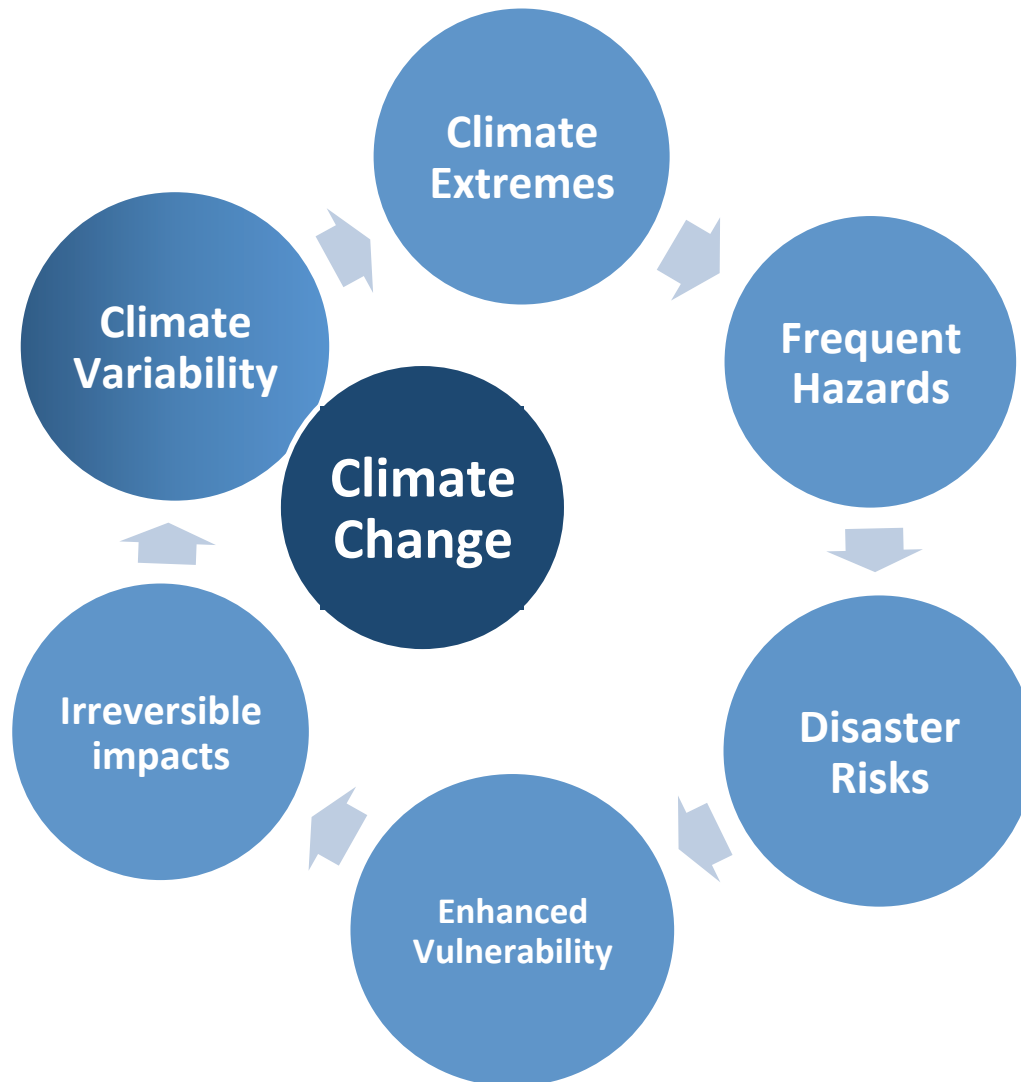




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Floods, Droughts & Storms are closely linked to
climate extremes (temperature and precipitation)



Additional risks due to climate change

- **should not be analyzed or treated in isolation,**
- **but instead integrated into broader efforts to reduce the risk of natural disasters.**



Figure I.II Global and Asia-Pacific disaster fatalities, 1970-2011

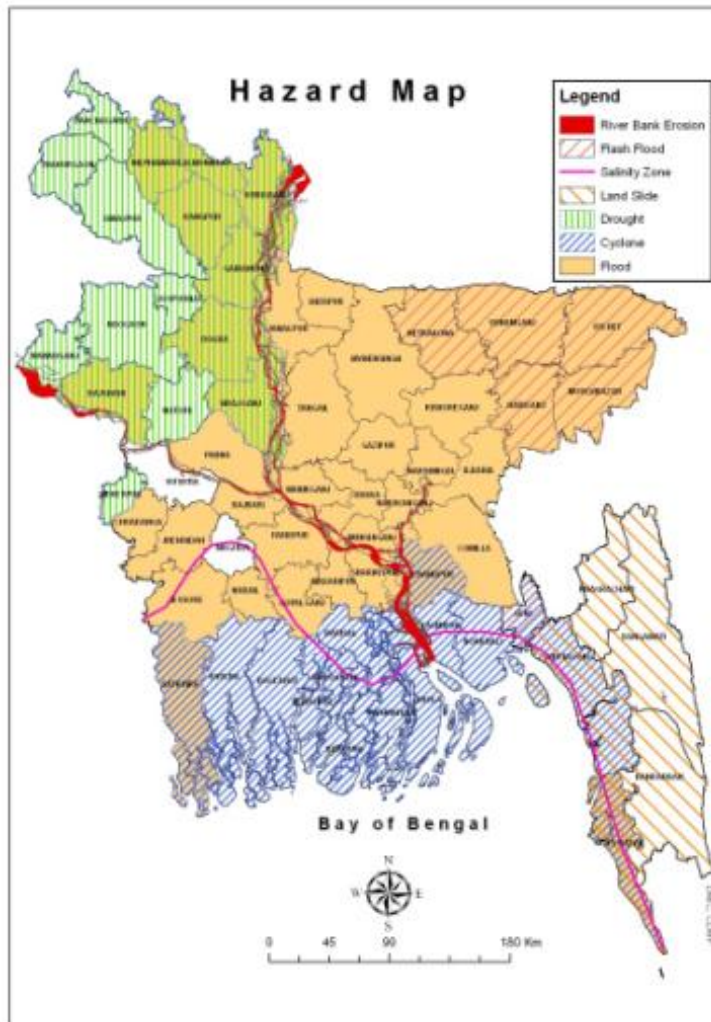


Source: Asia Pacific Disaster Report 2012

Asia- the most affected



Bangladesh



- Increasing frequency and severity of climatic events - flooding, cyclones and drought
- Increasing loss of assets and livelihoods
- Sea level rise (<45cm):
 - Inundate 10-17% of land by 2050
 - Directly impact up to 35 million people
- Projected global temperature increases by 2050 could:
 - Reduce rice production by 8%
 - Reduce wheat production by 32%
- Undermine macro-economic growth, reduce food security, and increase migration pressure



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Bangladesh - Devastating Impact of Cyclone Aila – 2009





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Laos – Saline water intrusion in agriculture fields





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Myanmar – UN-SPIDER Technical Advisory Mission



Lesson learned....



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Prepare well in advance !!!





Preparing well in advance needs certain actions

- Identify risks due to climate extremes – *EO data at affordable cost to project the risks*
- Timely assistance during emergency – *with real data*
- Assist on formulating policies at national/regional level - *SDI or Geospatial policies/ Data sharing*
- Assist in capacity building of the end users – *Involve in preparing proof of concepts/case studies*
- Advisory and Outreach to the end users – *Be part of UN-SPIDER advisory mission and outreach activities*



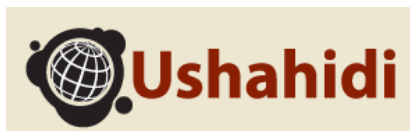
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GLCF



NOAA



OpenStreetMap
The Free Wiki World Map

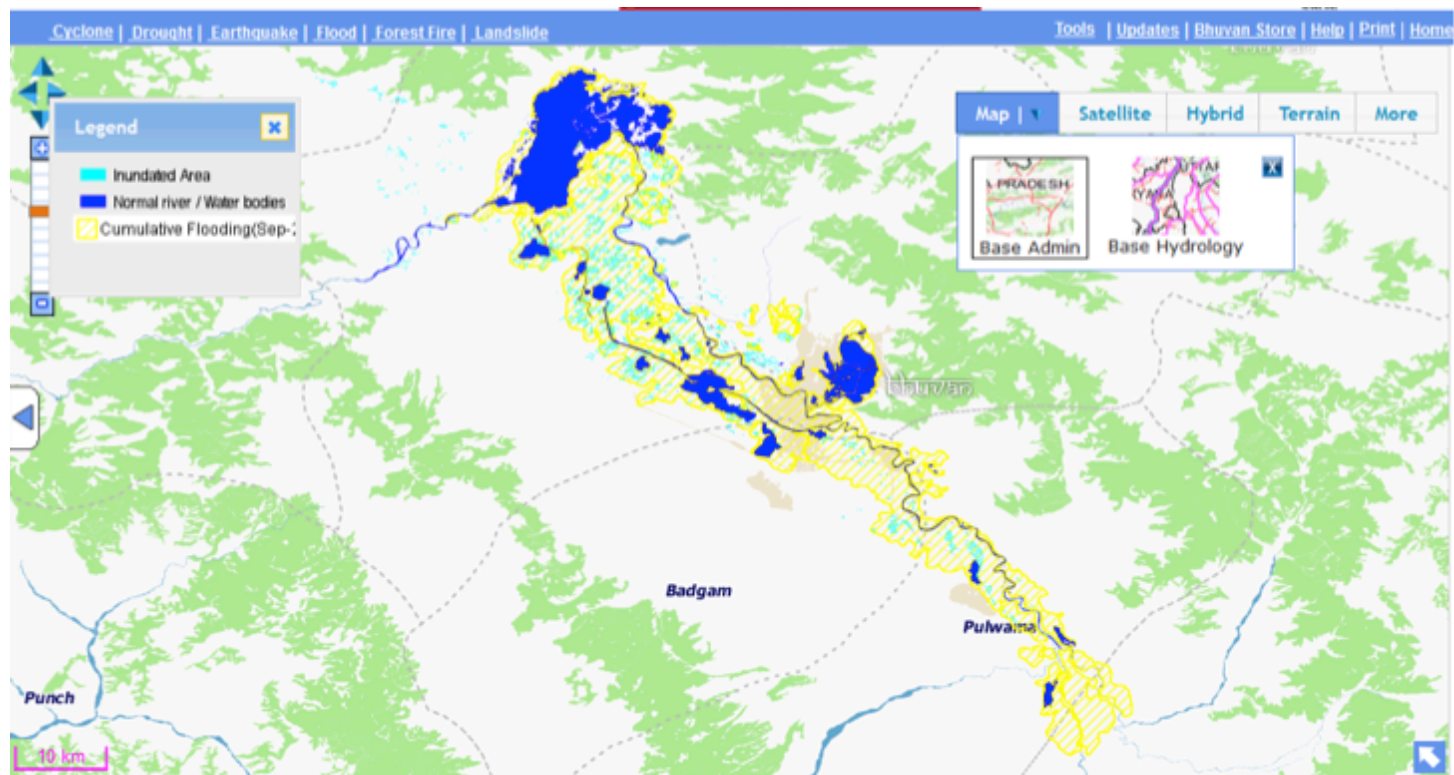
Earth Observation – Changing Dynamics

- Free or low cost earth observation data
- Innovative ways of data dissemination
- High resolution images for risk evaluation and damage assessment
- Advance sensors helping prediction of climate extreme events





Jammu and Kashmir Floods 2014



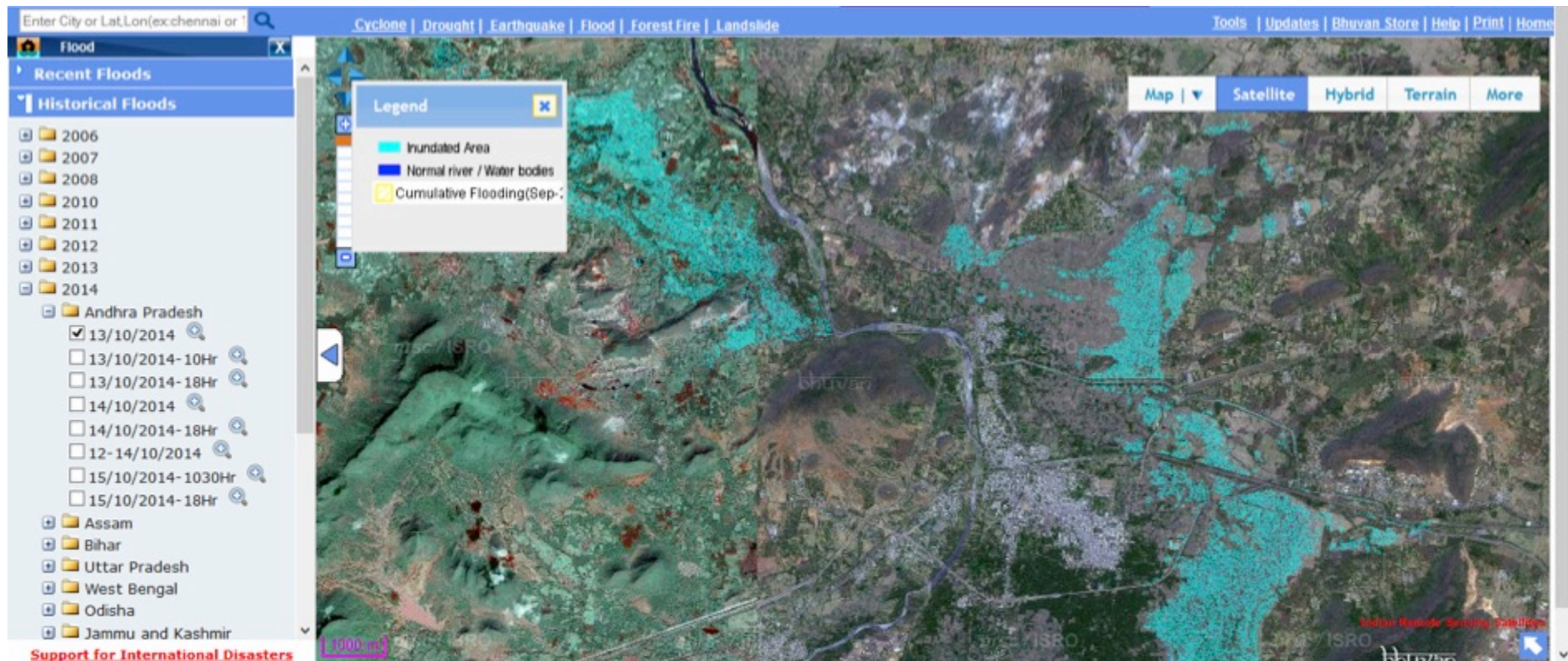
Severe floods
due to heavy
rains coupled
with rise in
the water
levels of
Jhelum river



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Flood 2014

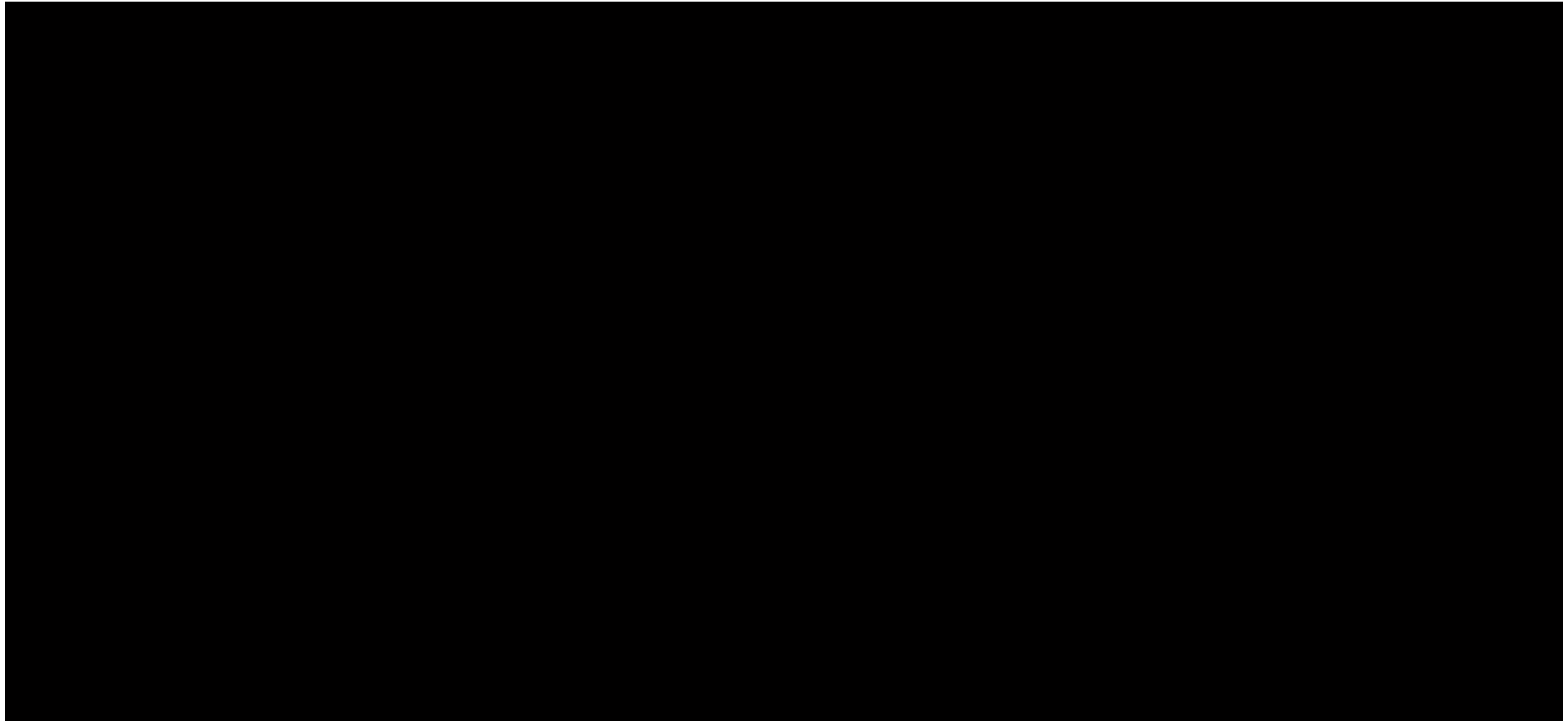


All the flood events were monitored and information is hosted at Bhuvan Geo-Portal

<http://bhuvan-noeda.nrsc.gov.in/disaster/disaster/disaster.php#>



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**Capacity
Building
April 2015**

Bangladesh – supported by DigitalGlobe



Bhutan – supported by AIRBUS

Upcoming events

- 2nd ASEAN workshop on Development of mechanisms for acquisition and utilisation of space based information during emergency response - 4-5 June 2015, Hangzhou, China
- 5th UN-SPIDER Beijing Conference - "A consolidating role in the implementation of the Sendai Framework on Disaster Risk Reduction: 2015-2030" 14-16 September 2015, Beijing, China
- International Training Programme on "Earth observation technologies for earthquake damage and loss assessment" 17-22 September 2015
- Special event in Delta State University – September 2015, Cleveland, USA



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Thanks

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