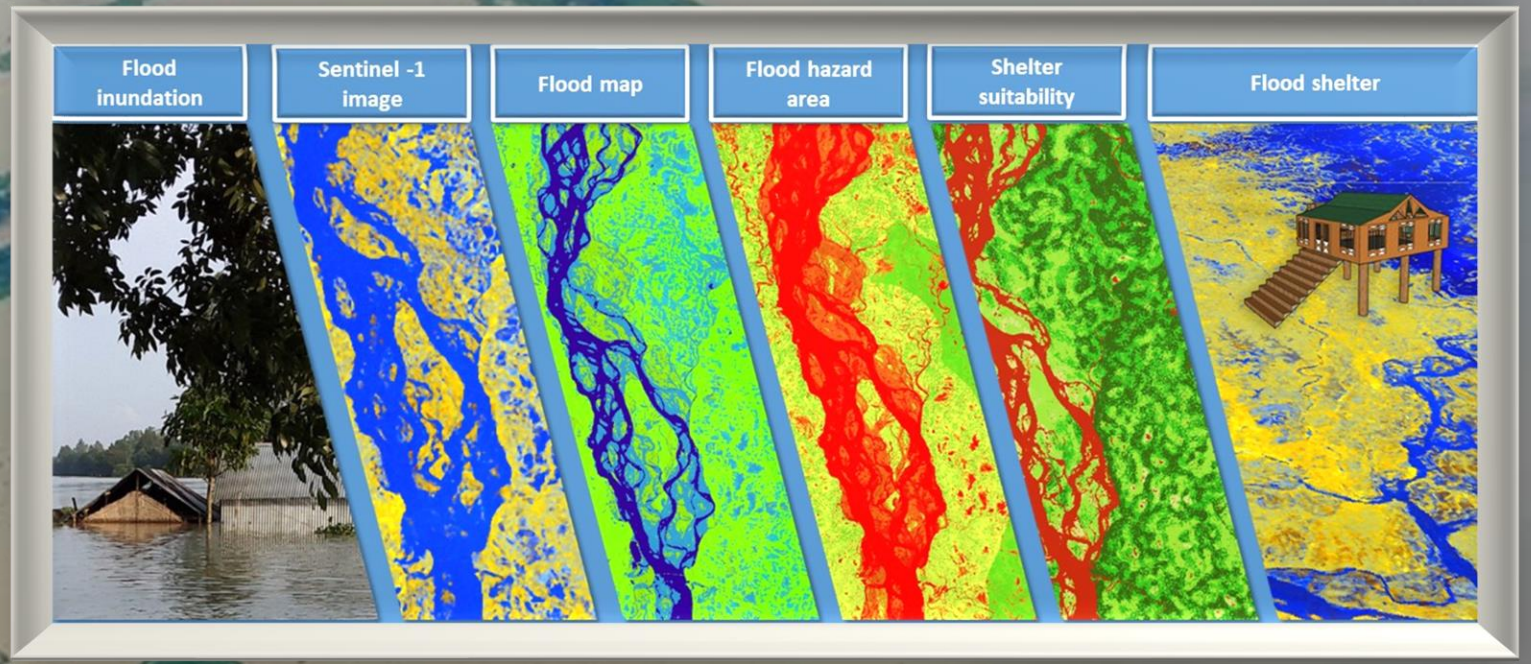
ICIMOD ADRC Asian Disaster Reduction Center (ADRC) BRIN BADAN RISET DAN INOVASI NASIONAL JAXA Sentinel Asia

8th Joint Project Team Meeting for Sentinel Asia STEP-3 (JPTM2023)

Potential flood hazard zonation and flood shelter suitability mapping for disaster risk mitigation in Bangladesh using geospatial technology



Kabir Uddin
Email: Kabir.Uddin@icimod.org


BBC NEWS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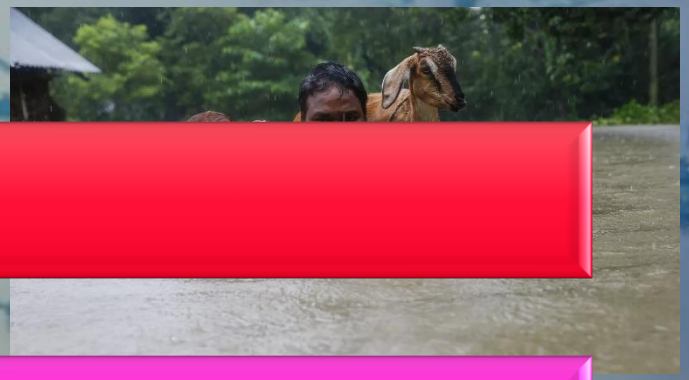
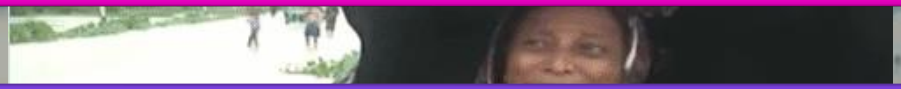


- Flood hazard, vulnerability and risk mapping
- Flood early warning system



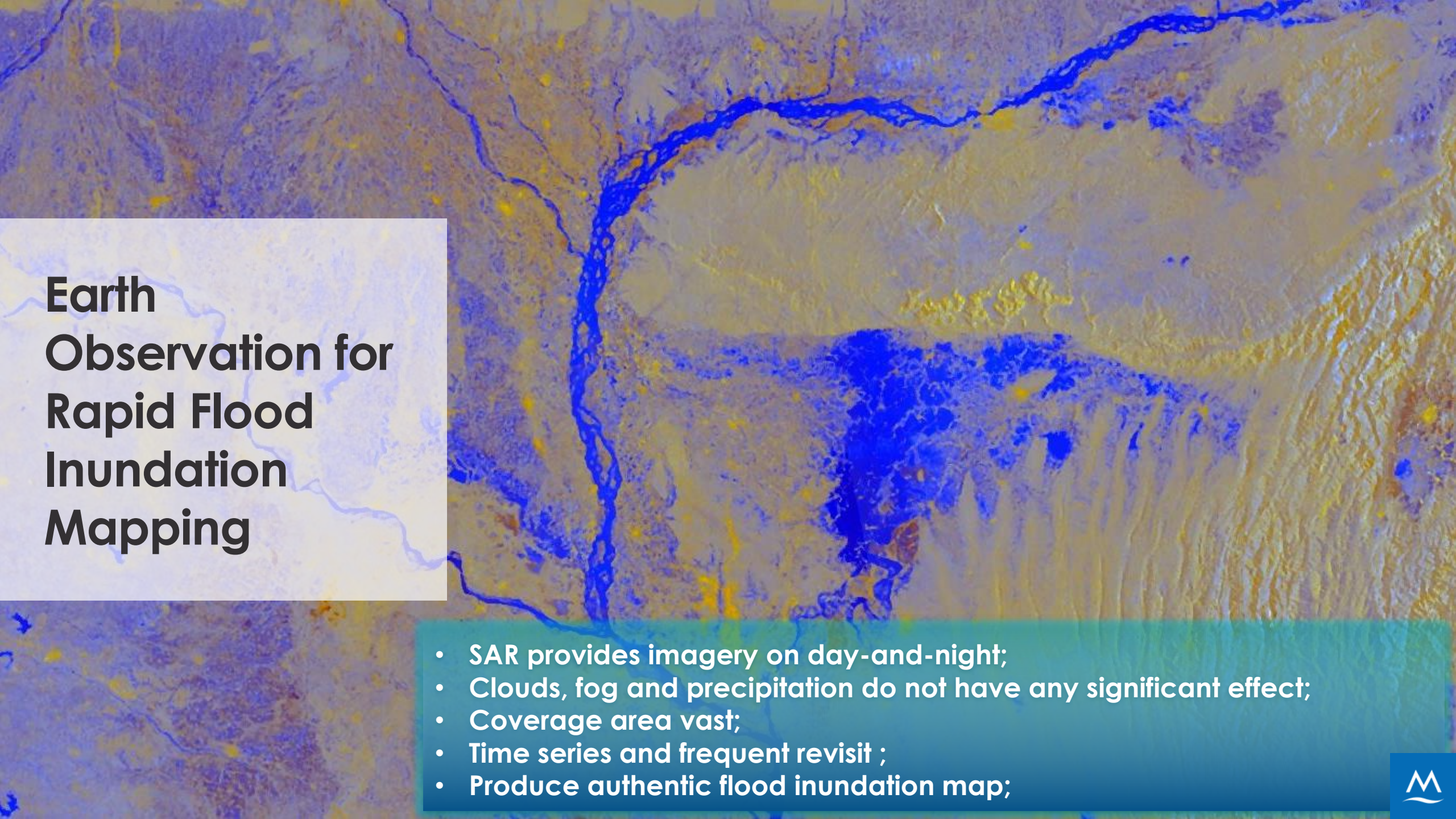
- Flood inundation area

- Flood damage assessment

- Flood shelter suitability area

Earth Observation for Rapid Flood Inundation Mapping

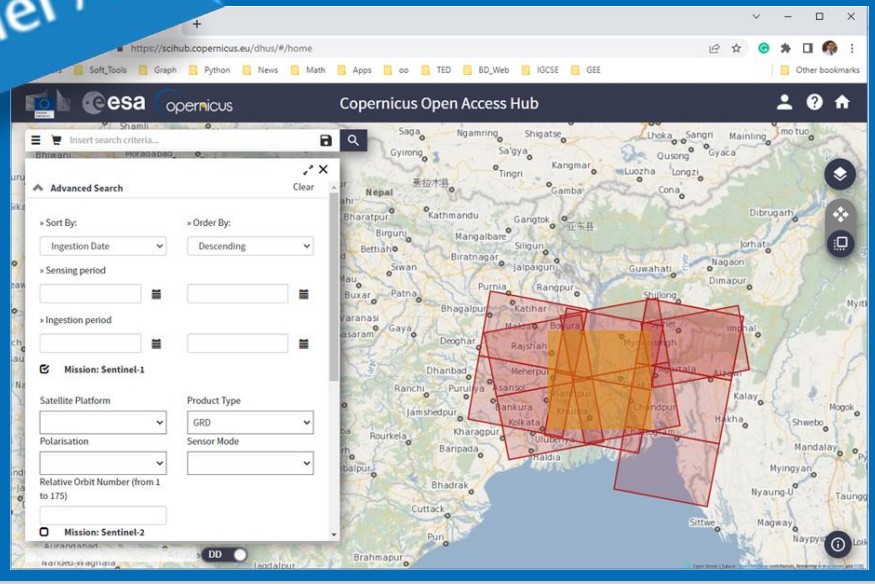
Earth Observation for Rapid Flood Inundation Mapping

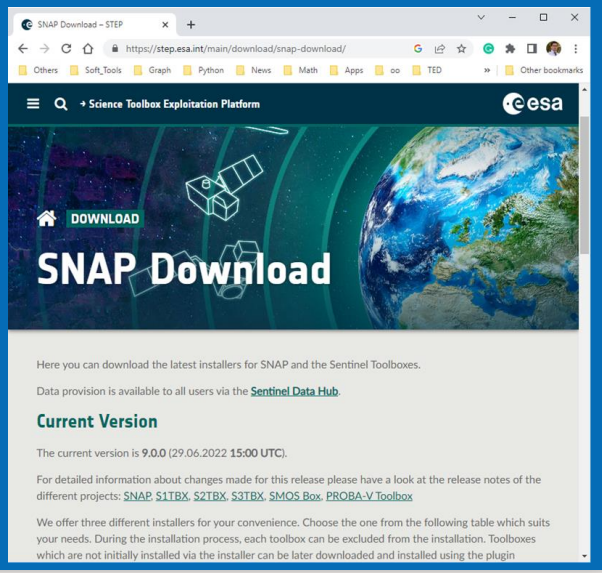


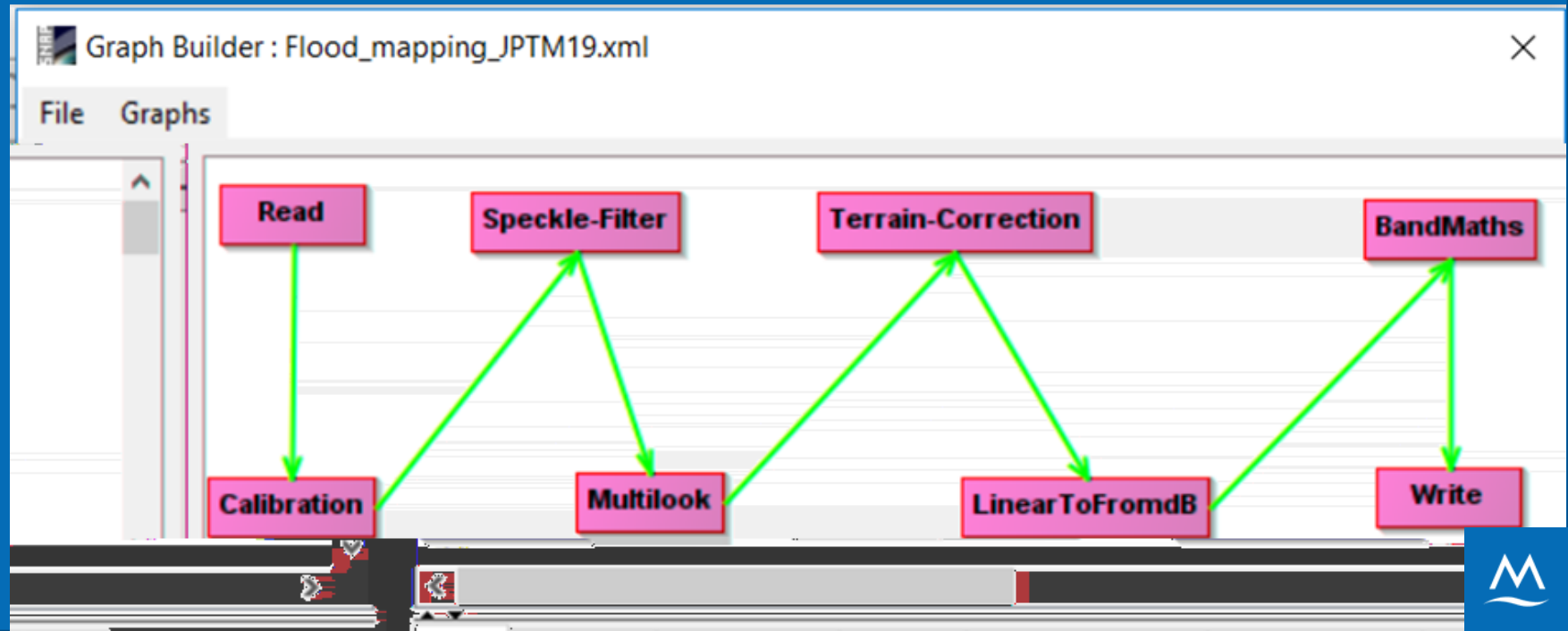
- SAR provides imagery on day-and-night;
- Clouds, fog and precipitation do not have any significant effect;
- Coverage area vast;
- Time series and frequent revisit ;
- Produce authentic flood inundation map;

Sentinel Asia

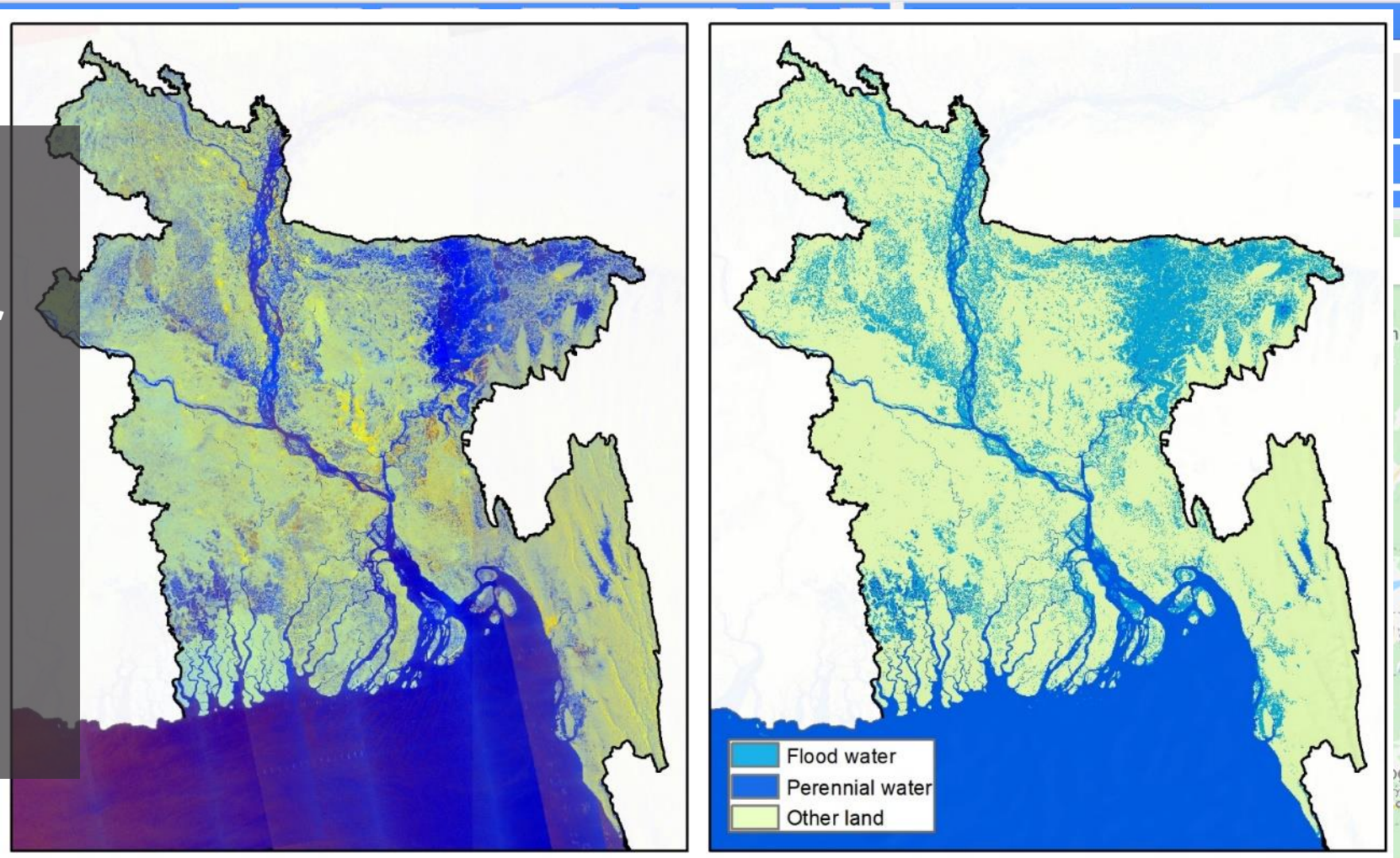
Tools for Earth Observation for Rapid Flood Inundation Mapping using SAR Imagery





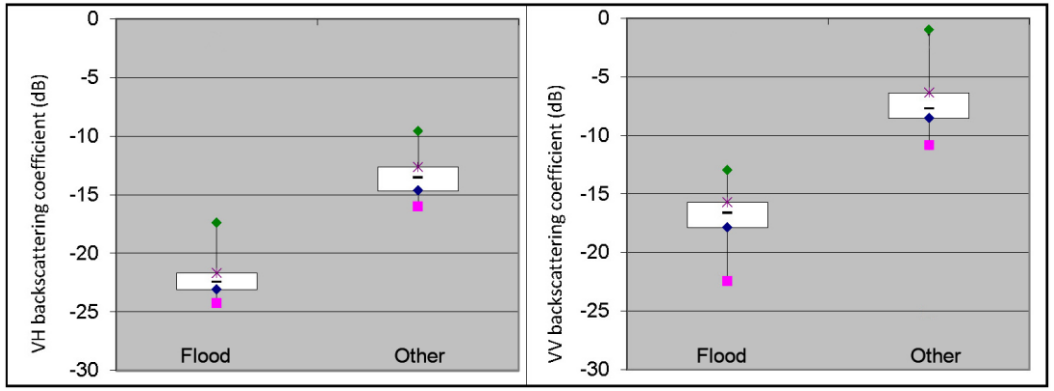


Tools for Earth Observation for Rapid Flood Inundation Mapping using SAR Imagery



GEE Code: https://tinyurl.com/2vfyvfkn

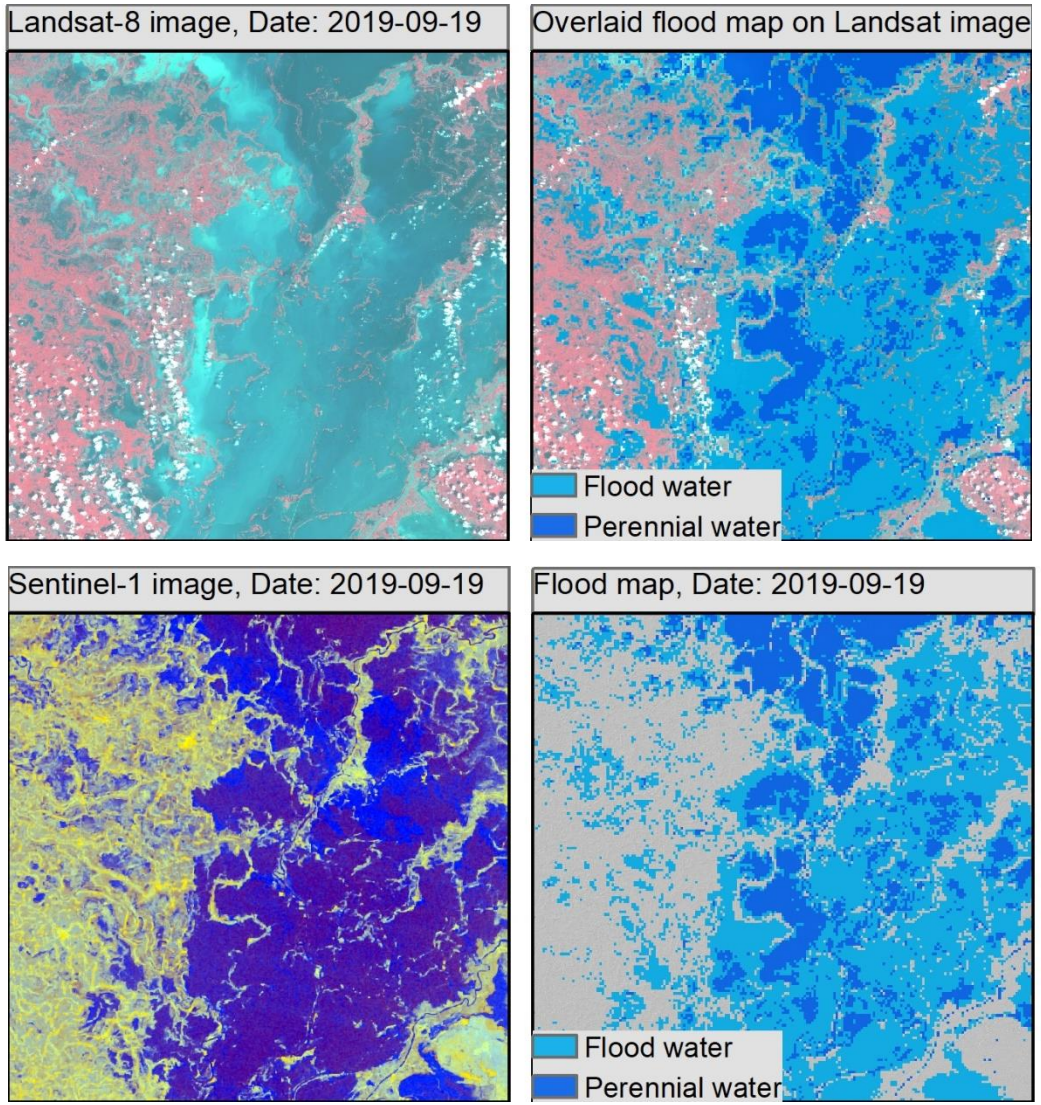
Ensuring the quality of rapid flood inundation map



Box plots of Sentinel-1 VV and VH backscatter value for waterbodies (flood inundation) and other samples

	Landsat-8			
Sentinel-1	Class name	Flood Inundation Area	Other	Total
	Flood Inundation Area	2233	231	2463
	Other	139	1769	1908
	Total	2372	2000	4372

Omission and commission matrix between Sentinel-1 and Landsat-8 images used for ensuring the quality of the developed maps



Comparison of optical data and SAR-based flood inundation: (a) Landsat-8 image from 19 September 2019; (c) colour-coded Sentinel-1 image from 19 September 2019, showing waterbodies in blue; (b) classification result based on Landsat-8; (d) classification result based on Sentinel-1 data (dark blue: perennial water; light blue: flood inundation areas; green: other areas)

GEE Code: https://tinyurl.com/4z4hv4m9

2016 Flood Inundation Mapping using SAR Imagery

About ICIMOD | Programmes | Mour

- Koshi Basin Programme Home
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- Base layers
- Hydro-Meteorology Stations
- Water resources
- Land
- Cryosphere
- Vuln
- Flood
- Inundation map as of 1 August 2016
- Inundation map as of 19 July 2016
- Village boundary
- Koshi basin
- Sub-basin
- Drainage Network
- Land cover (2010)
- Climate Change Impact

Flood Inundation Map of | Kabir

https://reliefweb.int/report/india/flood-inundation-map-koshi-basin-2016

Apps | Imported From IE | Others | Soft_Tools | IE Tab | Other bookmarks

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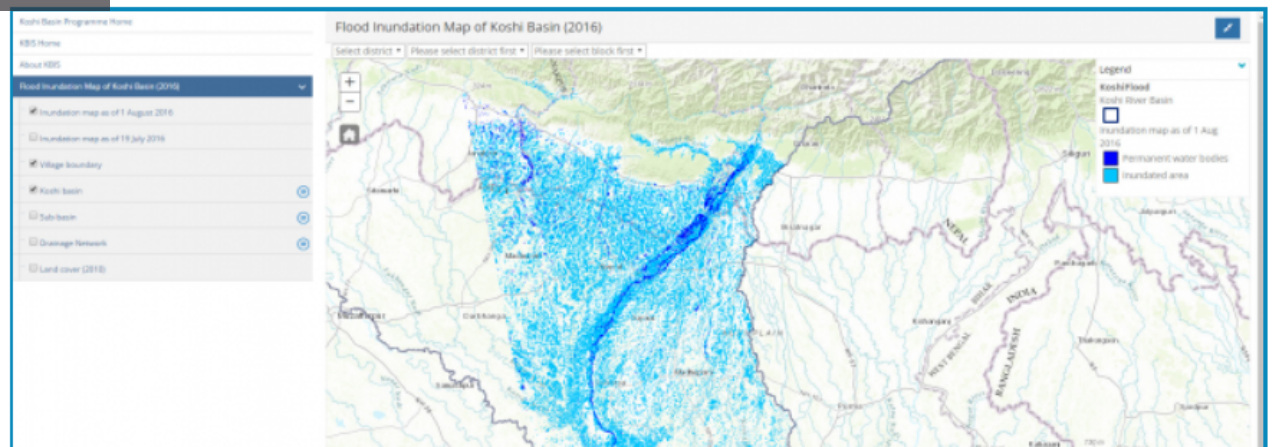
05 Aug 2016

Flood Inundation Map of Koshi Basin (2016)

INTERACTIVE from Government of Australia, International Centre for Integrated Mountain Development

Published on **05 Aug 2016** — View Original

Click the image(s) below to view the interactive content.



Primary country
India

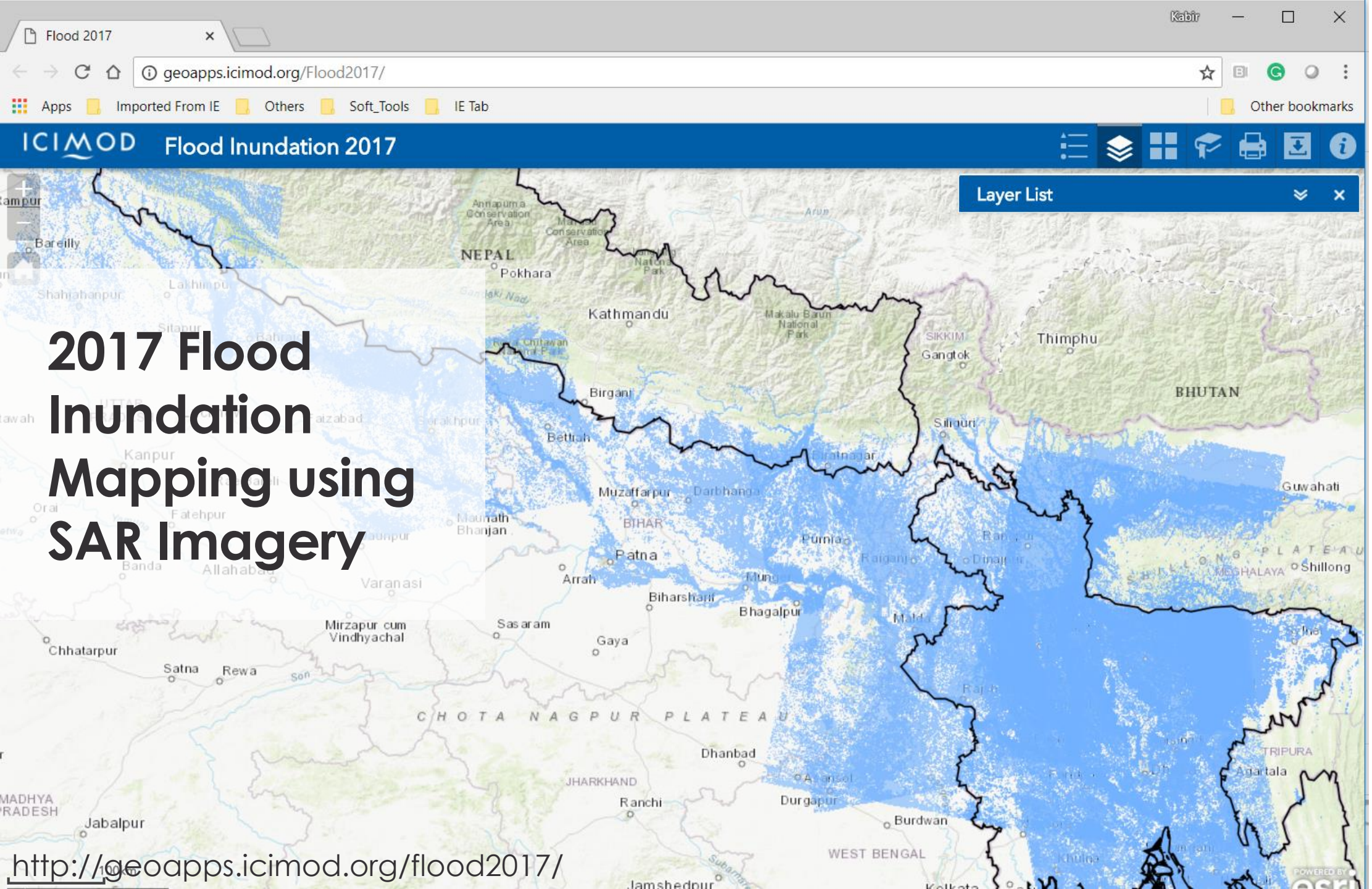
Other countries
China
Nepal

India: Floods - Jun 2016

Other disasters
Nepal: Floods and Landslides - Jul 2016

Content Format:
Interactive

Language:


Flood 2017
geoapps.icimod.org/Flood2017/
Apps
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Others
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ICIMOD
Flood Inundation 2017
Layer List
2017 Flood Inundation Mapping using SAR Imagery
NEPAL
Pokhara
Kathmandu
Bareilly
Shahjahanpur
Lakhimpur
Sitapur
Kanpur
Fatehpur
Banda
Allahabad
Varanasi
Mirzapur cum Vindhyachal
Chhatarpur
Satna
Rewa
Jabalpur
MADHYA PRADESH
Sasaram
Gaya
Arrah
Patna
Biharsharif
Bhagalpur
Muzaffarpur
Darbhanga
BIHAR
Purnia
Birganj
Bettiah
Gangtok
SIKKIM
Thimphu
BHUTAN
Siliguri
Guwahati
Shillong
MEGHALAYA
CHOTA NAGPUR PLATEAU
JHARKHAND
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Burdwan
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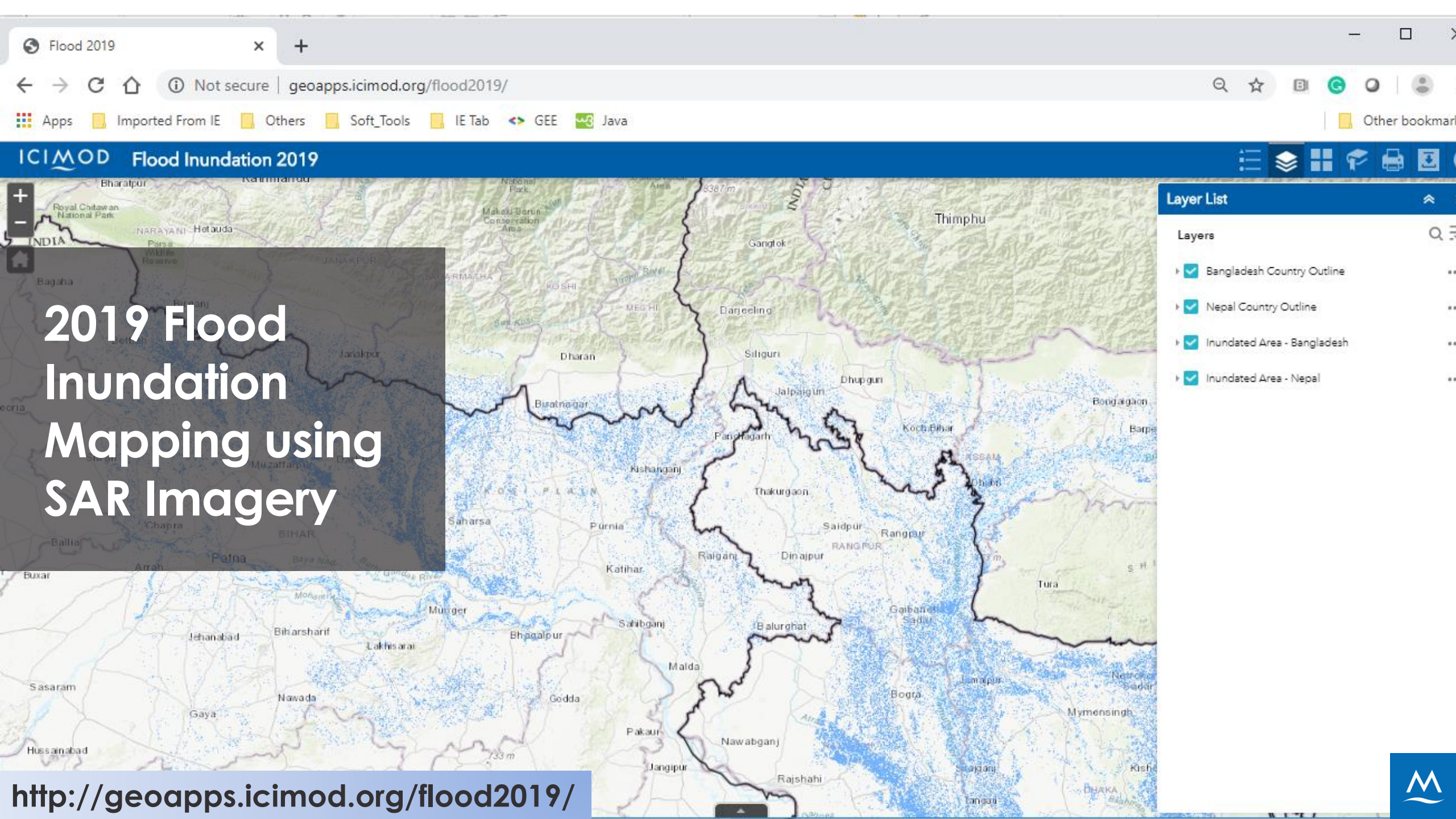
Jamshedpur
TRIPURA
Agartala
http://geoapps.icimod.org/flood2017/


Flood 2019
Not secure | geoapps.icimod.org/flood2019/
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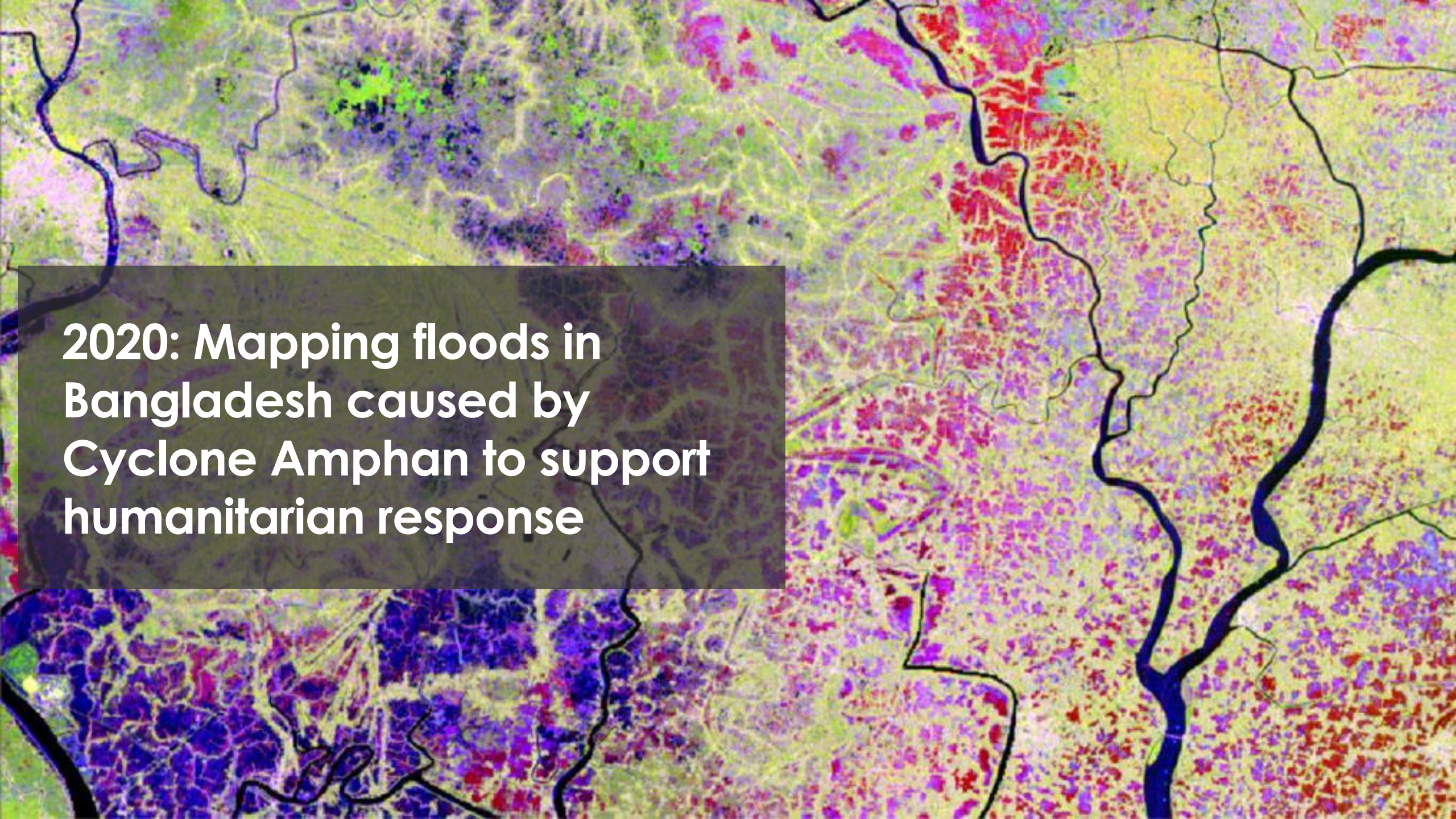
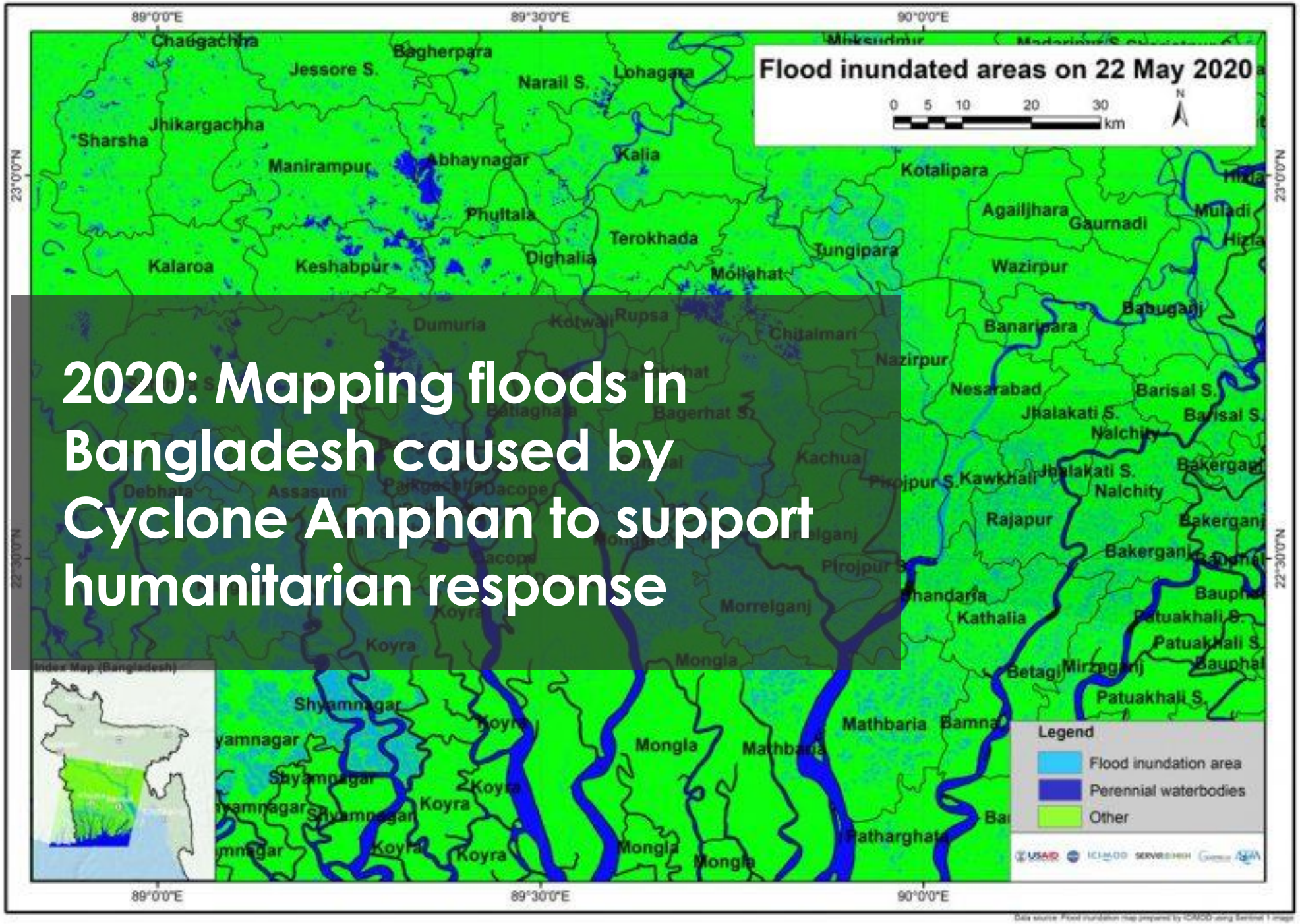
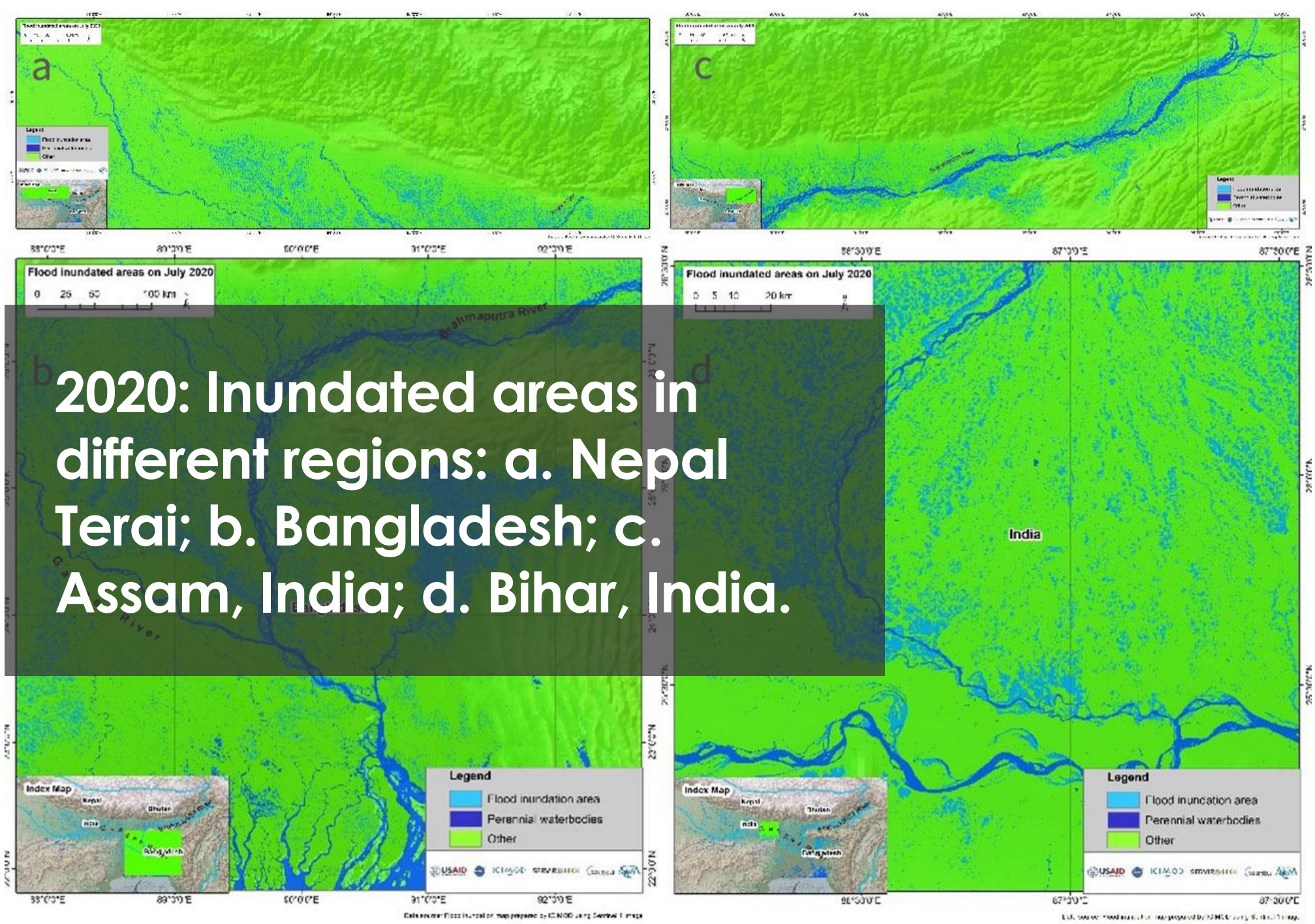
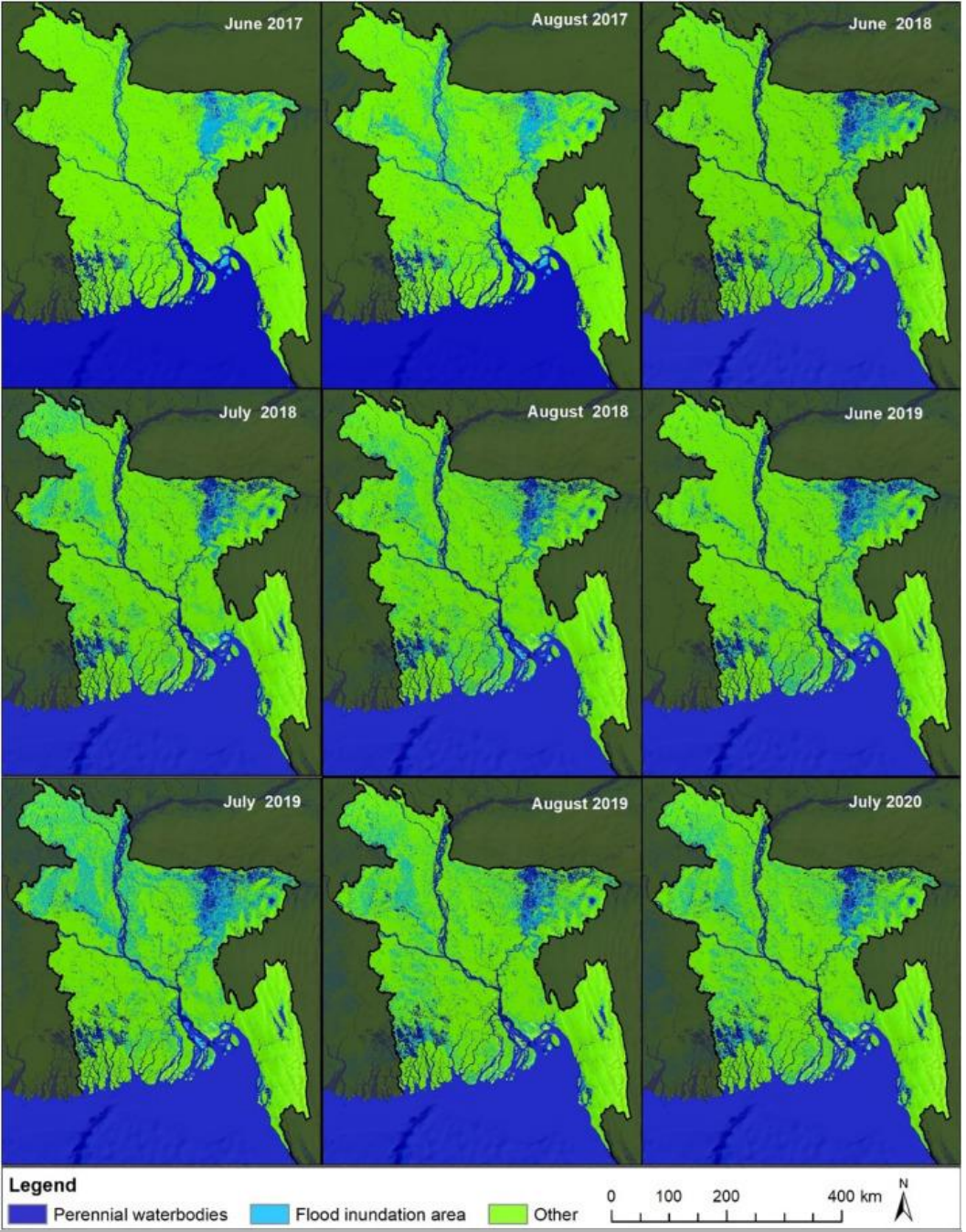
ICIMOD Flood Inundation 2019
Layer List
Layers
Bangladesh Country Outline
Nepal Country Outline
Inundated Area - Bangladesh
Inundated Area - Nepal
2019 Flood Inundation Mapping using SAR Imagery
http://geoapps.icimod.org/flood2019/


2020: Mapping floods in Bangladesh caused by Cyclone Amphan to support humanitarian response

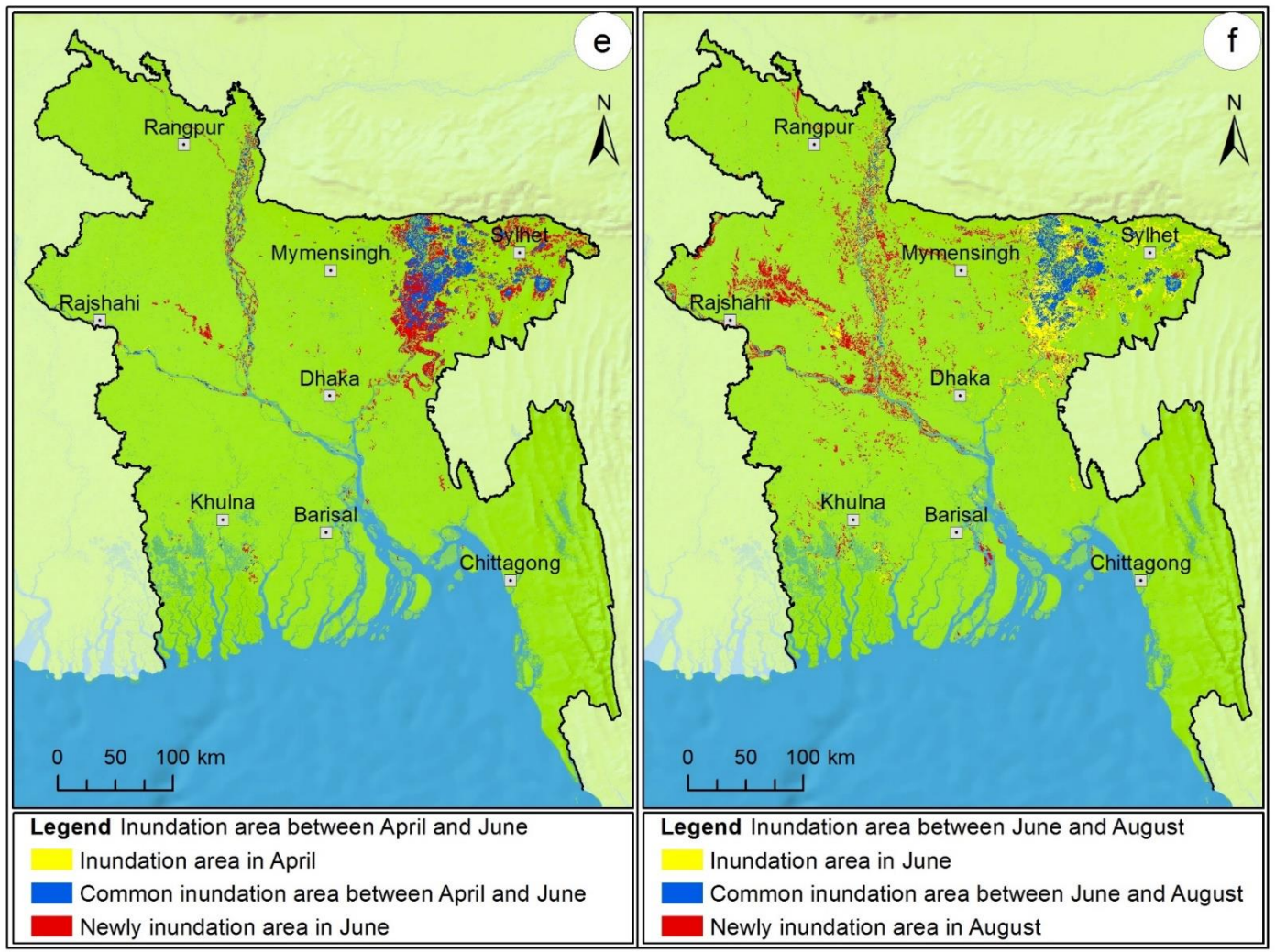

Flood inundated areas on 22 May 2020
0 5 10 20 30
km
N
2020: Mapping floods in Bangladesh caused by Cyclone Amphan to support humanitarian response
Index Map (Bangladesh)
Legend
Flood inundation area
Perennial waterbodies
Other
89°0'0"E
89°30'0"E
90°0'0"E
23°0'0"N
22°30'0"N
Chaugachha
Bagherpara
Jessore S.
Narail S.
Lohagara
Jhikargachha
Sharsha
Manirampur
Abhaynagar
Kalia
Phultala
Terokhada
Dighalia
Kalaroa
Keshabpur
Mollahat
Kotalipara
Agailjhara
Gaurnadi
Muladi
Tungipara
Wazirpur
Babuganj
Banaripara
Nazirpur
Nesarabad
Barisal S.
Jhalakati S.
Nalchity
Pirojpur S.
Kawkhali
Bakerganj
Rajapur
Bhandaria
Kathalia
Patuakhali S.
Betagi
Mirzaganj
Bauphal
Dumuria
Kotwali
Rupsa
Chitalmari
Debhata
Assasuni
Dacope
Morrelganj
Koyra
Mongla
Shyamnagar
Mathbaria
Patharghata



2020: Inundated areas in different regions: a. Nepal Terai; b. Bangladesh; c. Assam, India; d. Bihar, India.

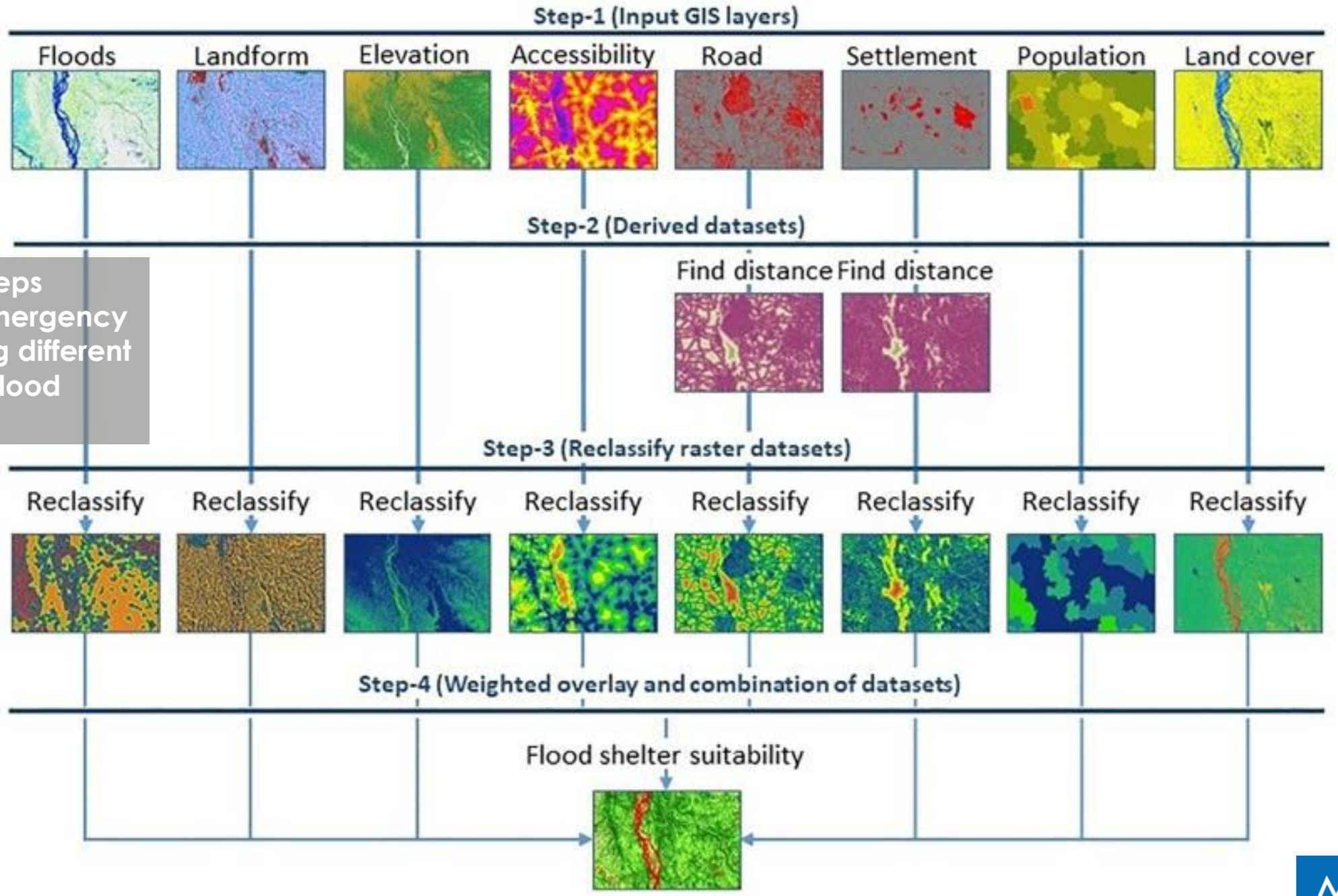


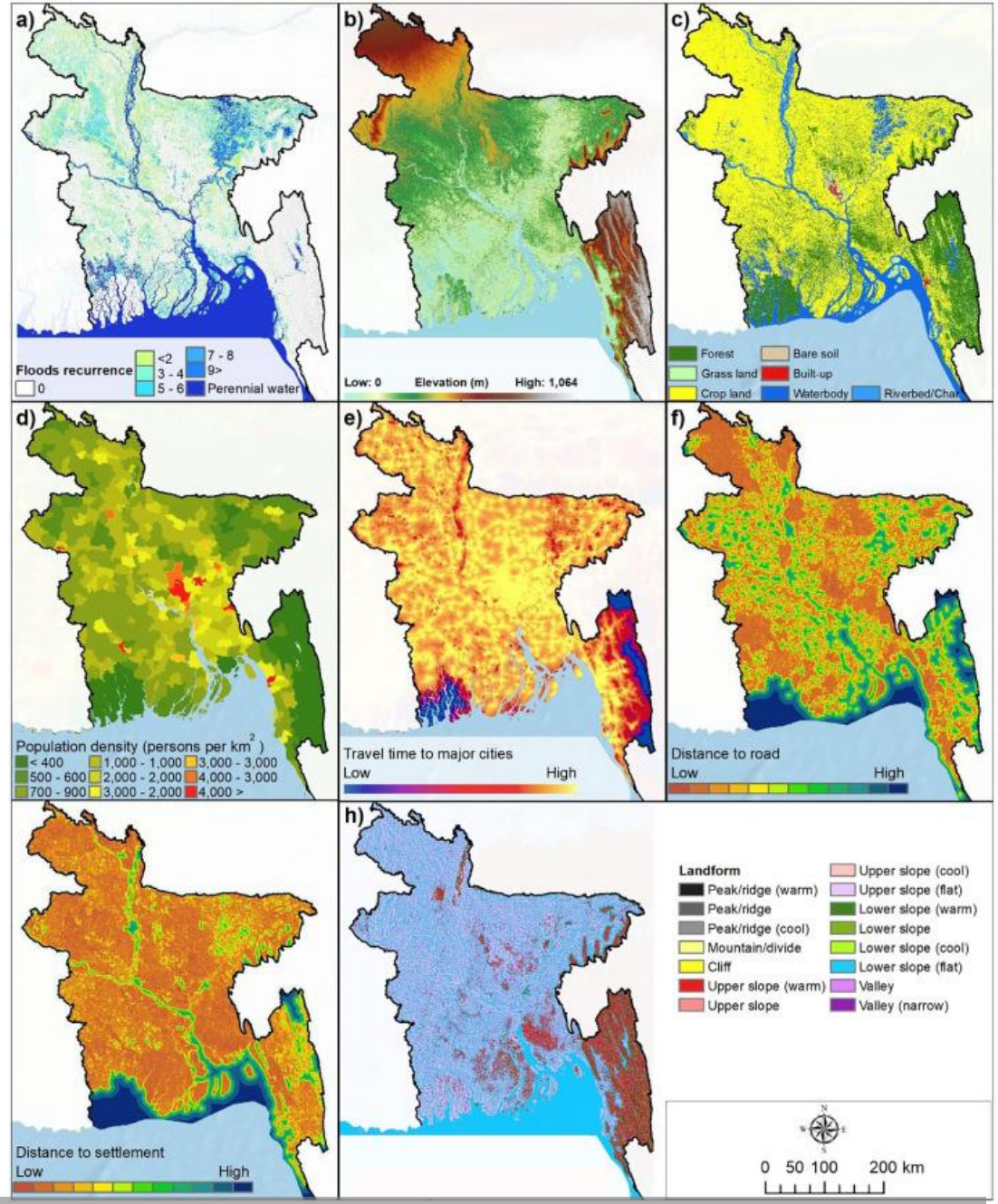
Flood extents of June and August 2017; June, July and August 2018; June, July and August 2019; and July 2020 of Bangladesh.



Flood recession and rise areas of Bangladesh between (e) April and June, (f) June and August.

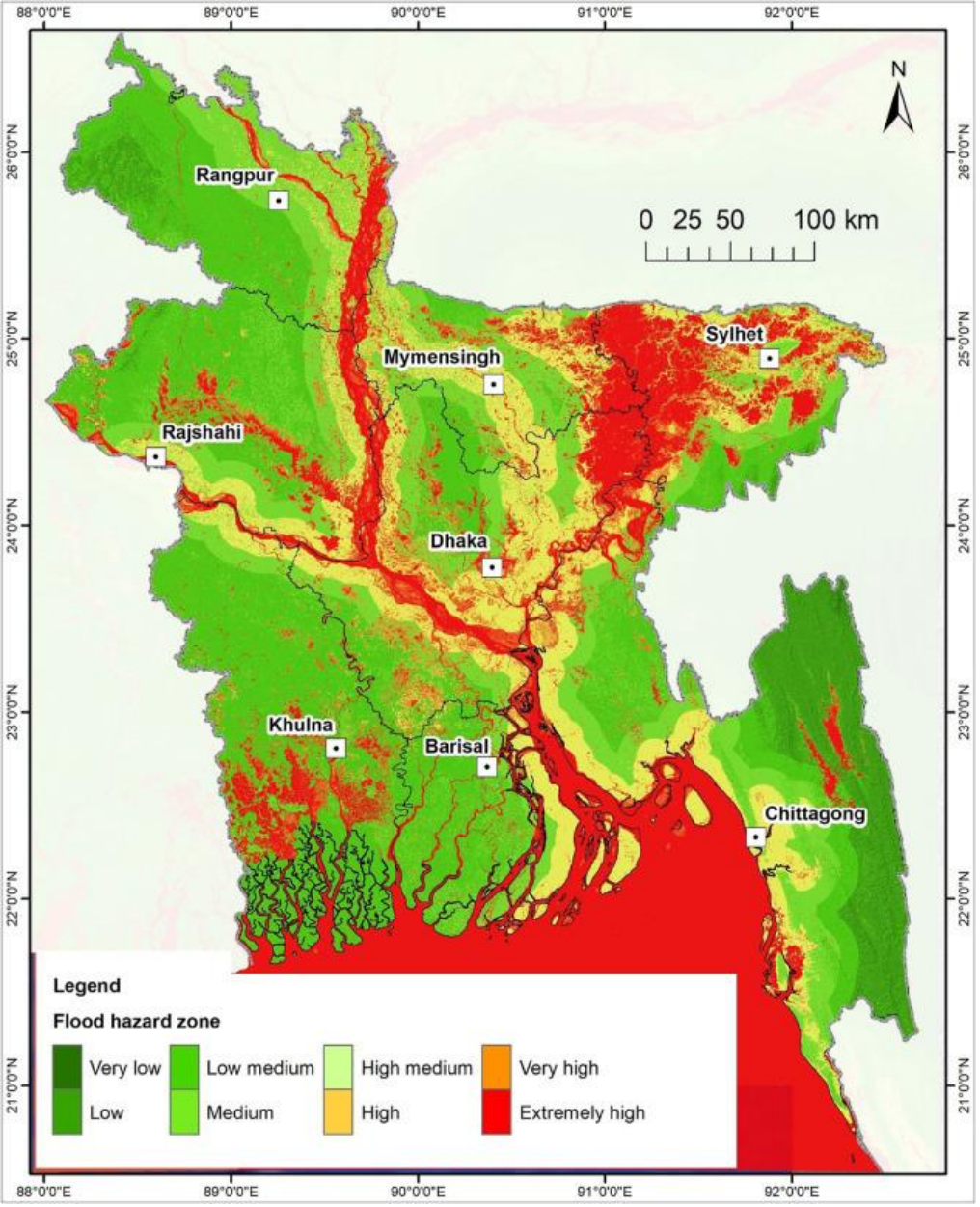
Main methodological steps followed for the flood emergency suitability mapping using different factors associated with flood shelters.



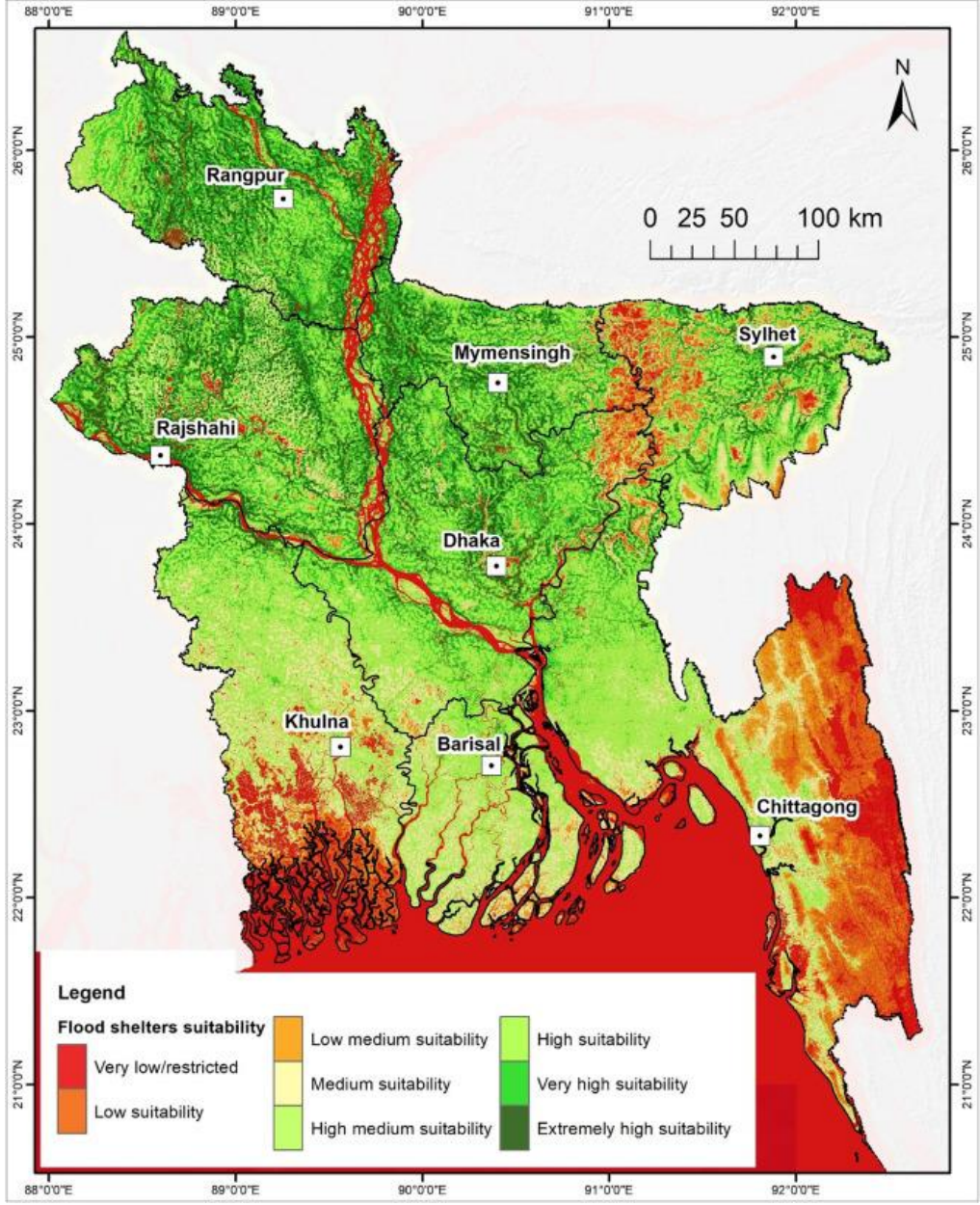


GIS layers used for the flood suitability mapping

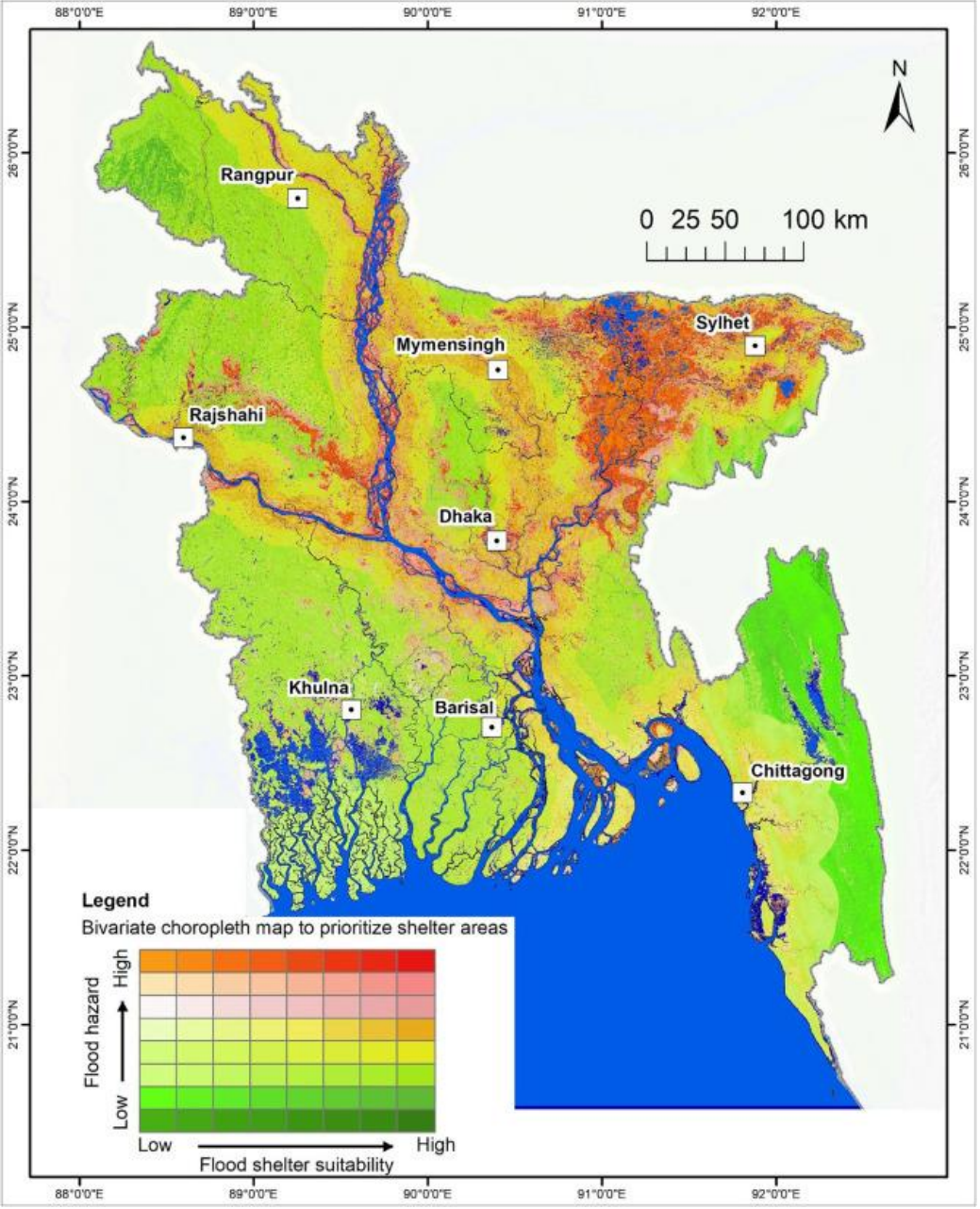
Picture of typical inundation area of Bangladesh, (a, b, c) The village in Jabalpur district inundated by the 2020 floodwaters. d) An aerial photo of rural settlements enclosed by floodwaters during 2017.



Flood hazard map of Bangladesh



Flood shelter suitability map of Bangladesh

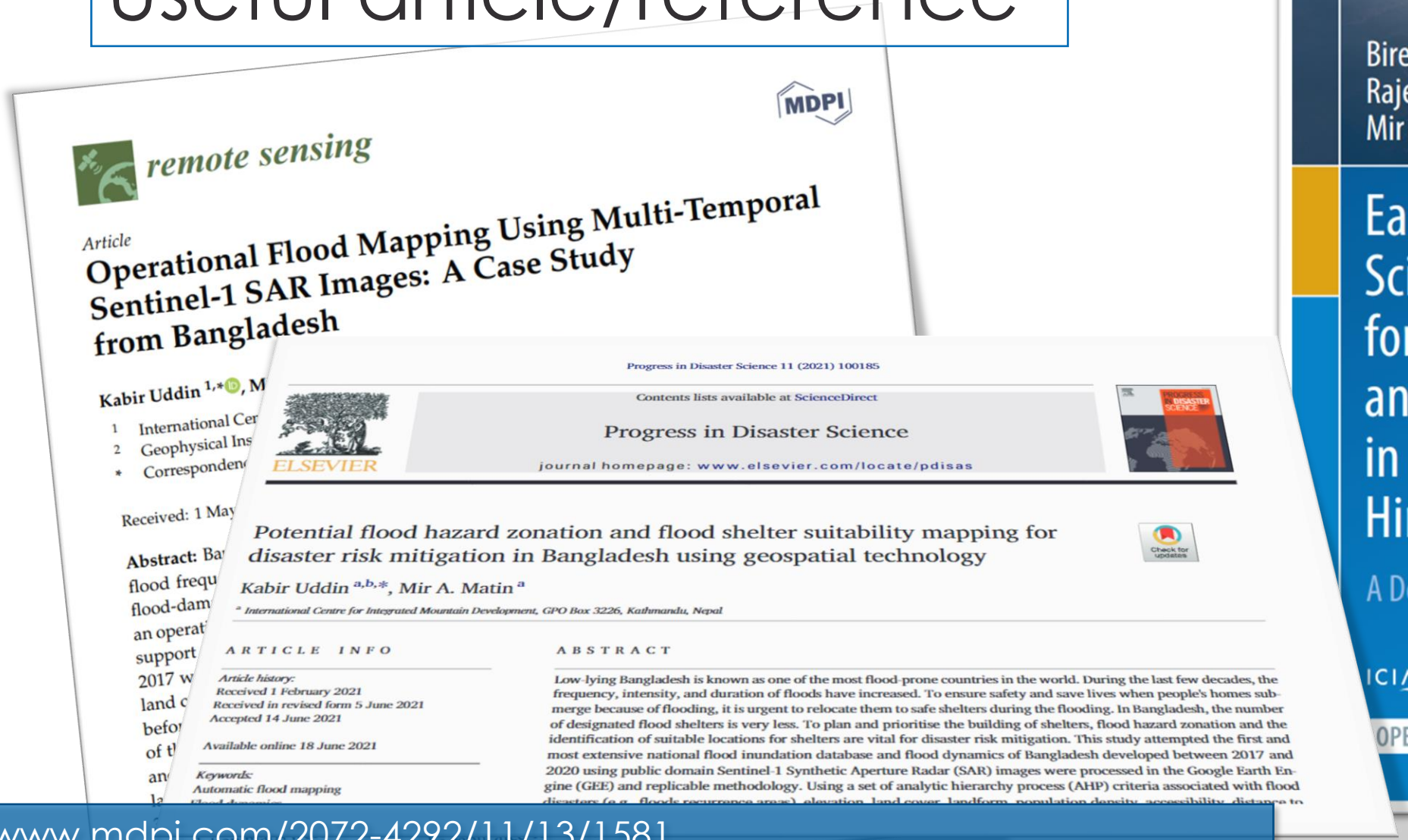


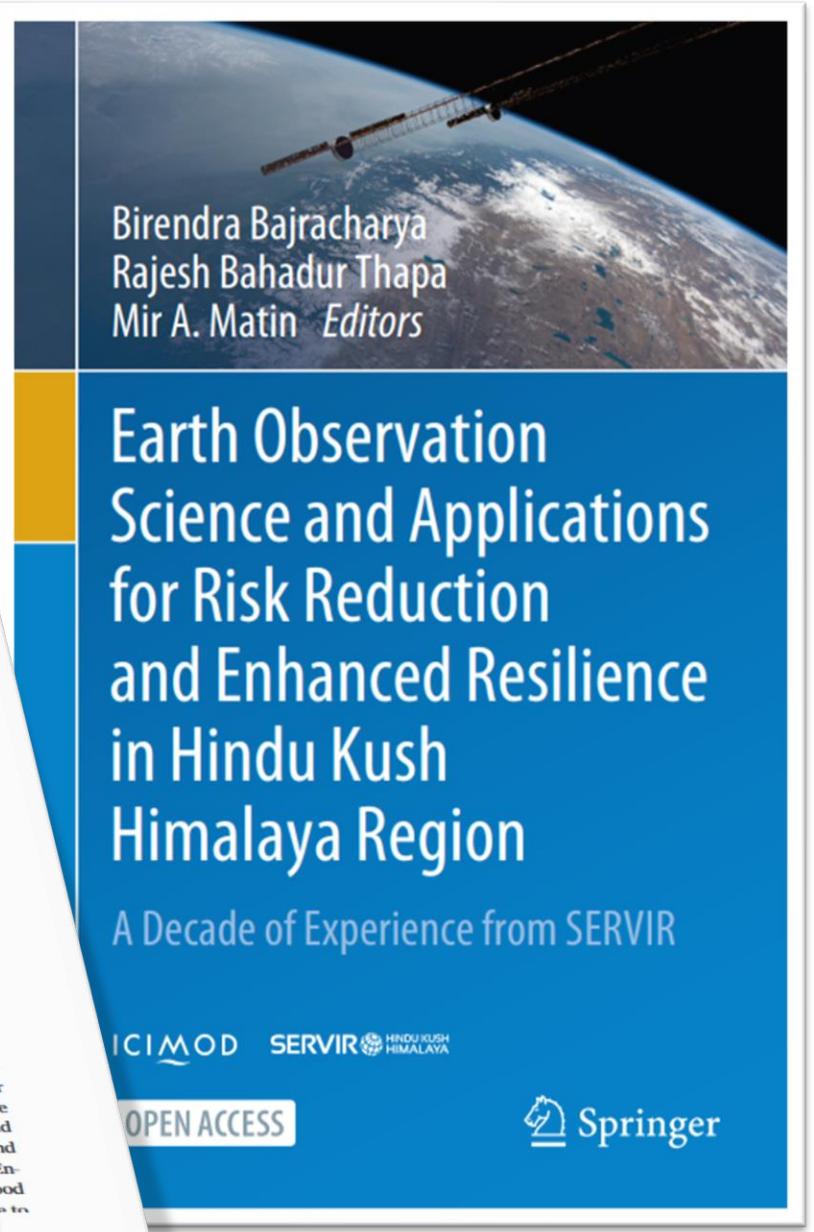
Priority area for flood shelter construction based on the bivariate choropleth analysis using flood hazard and flood shelter suitability maps in Bangladesh

Aerial photo shows flood-affected houses in Faridpur, Bangladesh, (Photo credit: Xinhua)

People take shelter at Shialhar Government Primary School in Gowainghat, Sylhet (Photo credit: Dhaka Tribune)

Useful article/reference





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Thank you

Let's protect the pulse.