Earth observation applications at ICIMOD

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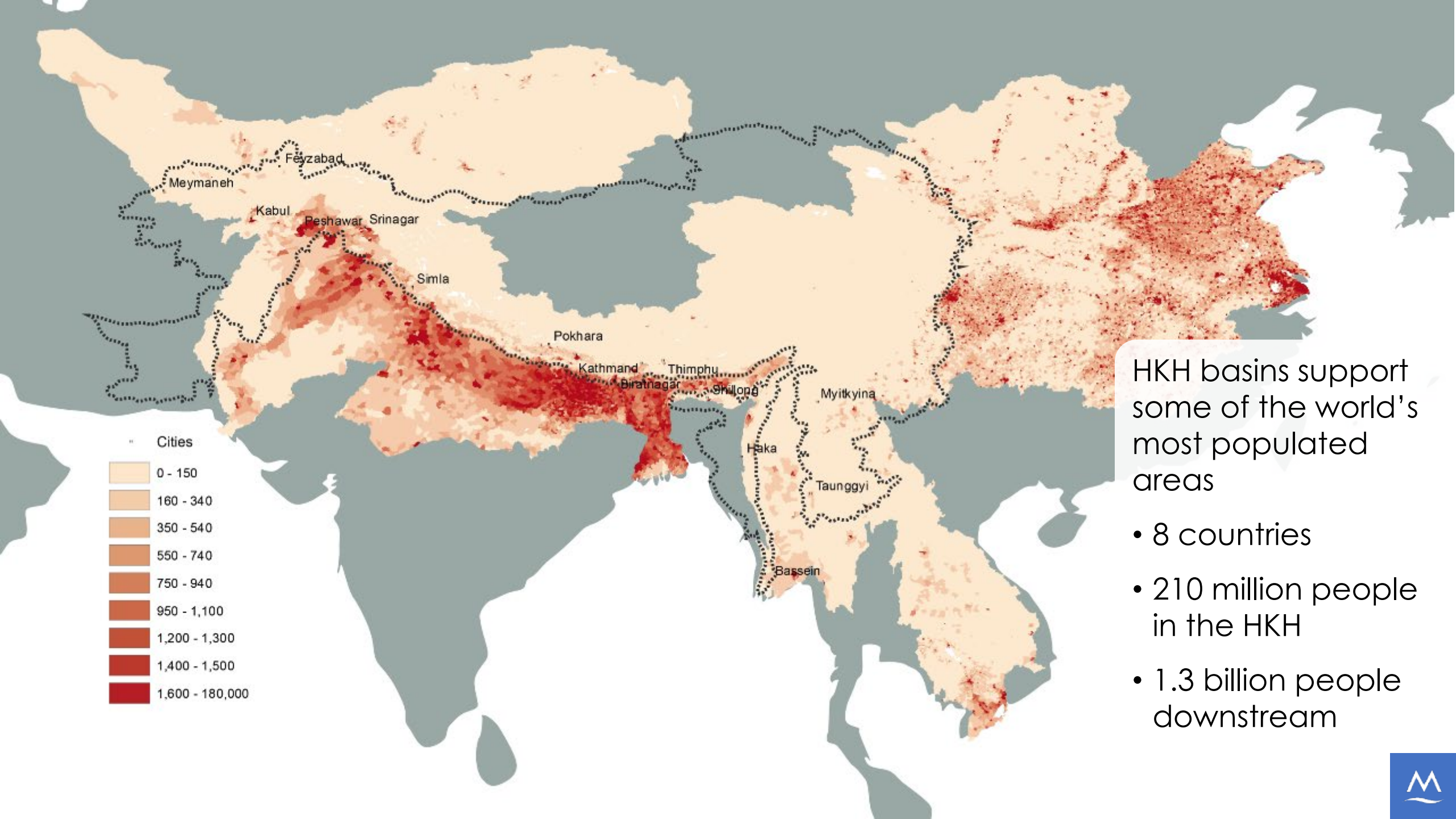
International Centre for Integrated Mountain Development (ICIMOD)

A regional mountain knowledge, learning, and enabling centre devoted to sustainable mountain development for mountains and people

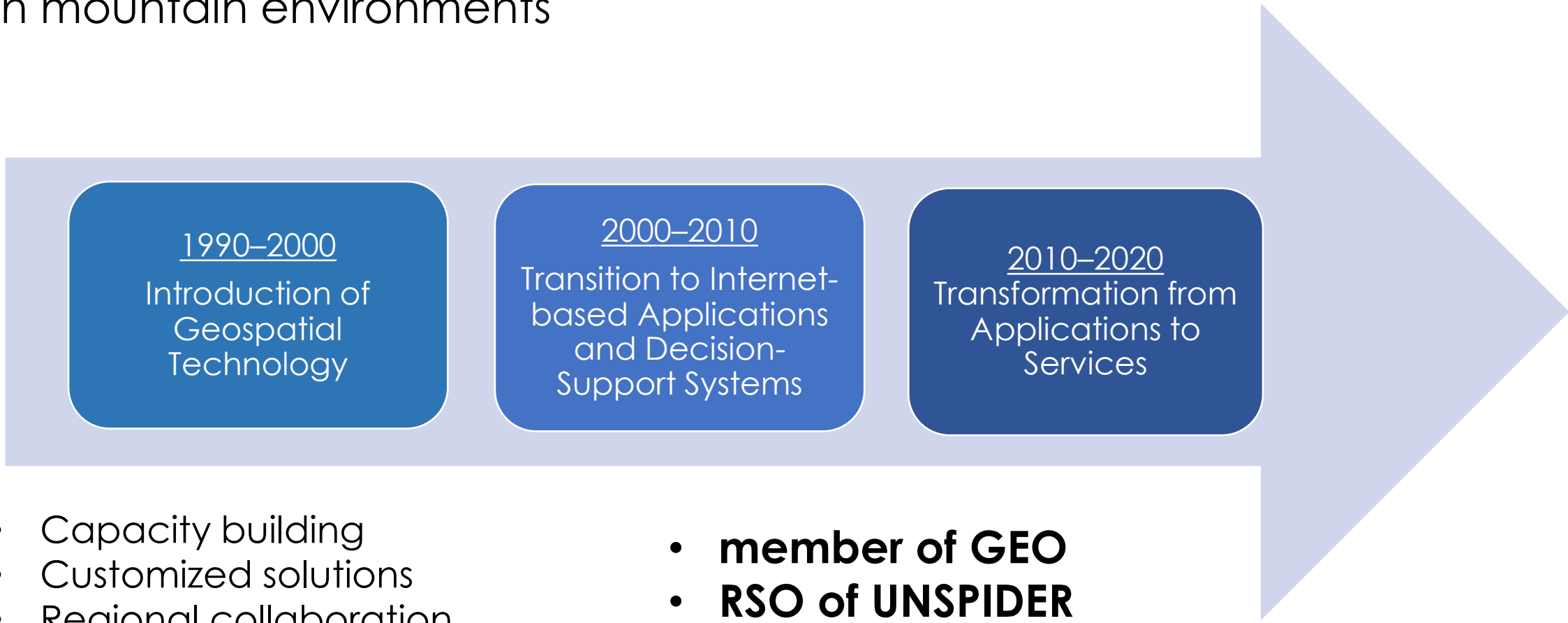


HKH basins support some of the world's most populated areas

- 8 countries
- 210 million people in the HKH
- 1.3 billion people downstream

EO Applications in the HKH

ICIMOD established Mountain Environment Regional Information System (MENRIS) in 1990 to promote the use of GIS and RS applications focusing on mountain environments



- Capacity building
- Customized solutions
- Regional collaboration

- **member of GEO**
- **RSO of UNSPIDER**

ICIMOD as a regional hub of SERVIR

SERVIR HINDU KUSH HIMALAYA

Thematic Priorities

Agriculture and food security

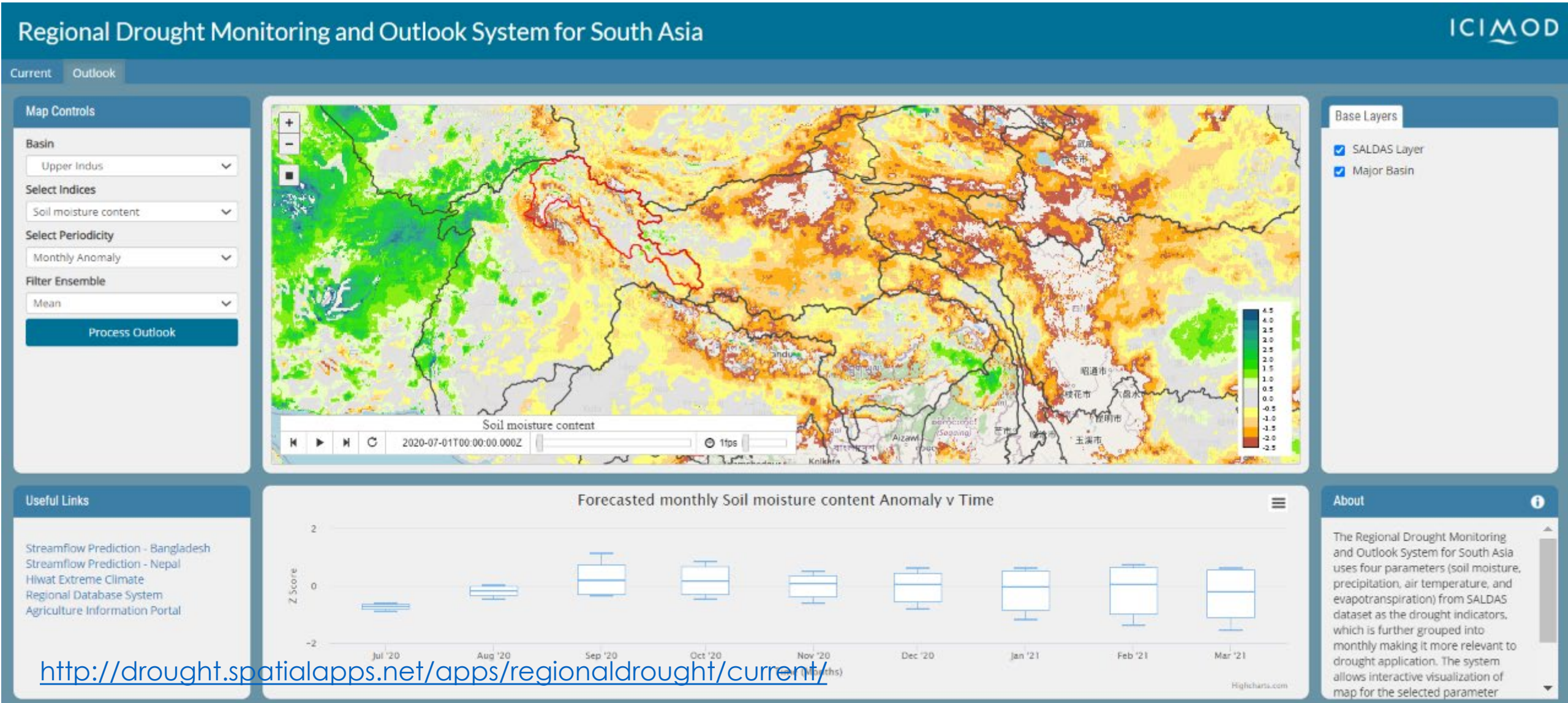
LULC and Ecosystems

Water resources and hydro-climatic disasters

Weather and climate

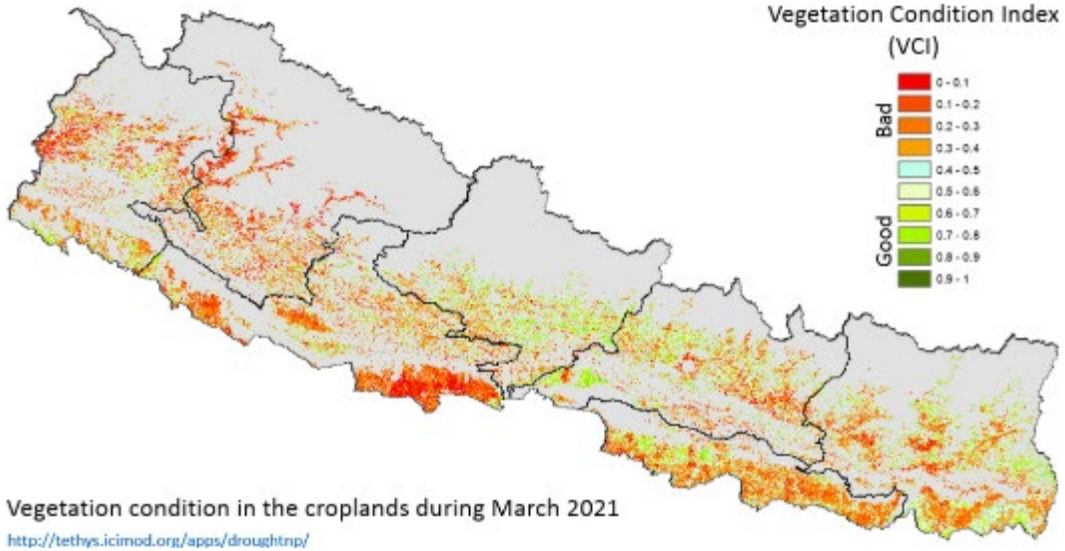
Agriculture and Food Security

- Drought Monitoring and Outlook



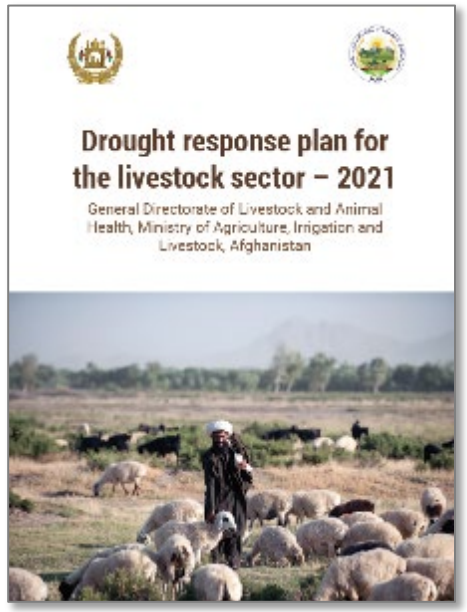
http://drought.spatialapps.net/apps/regionaldrought/current/

Drought monitoring and early warning

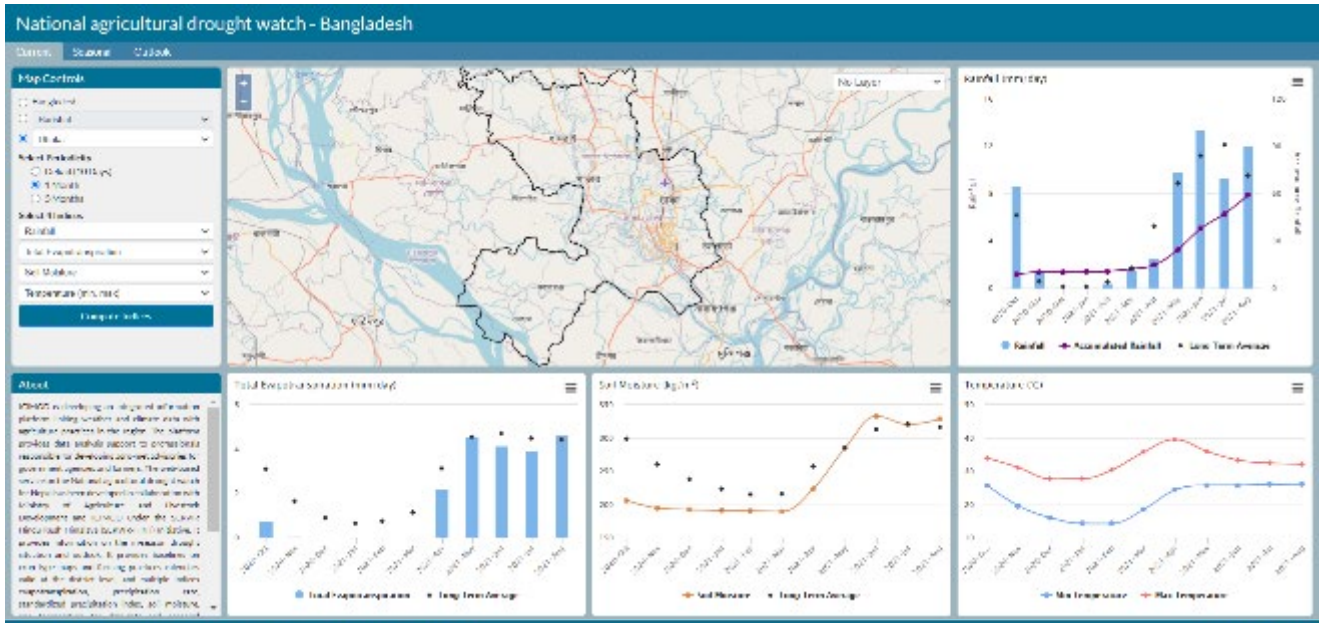


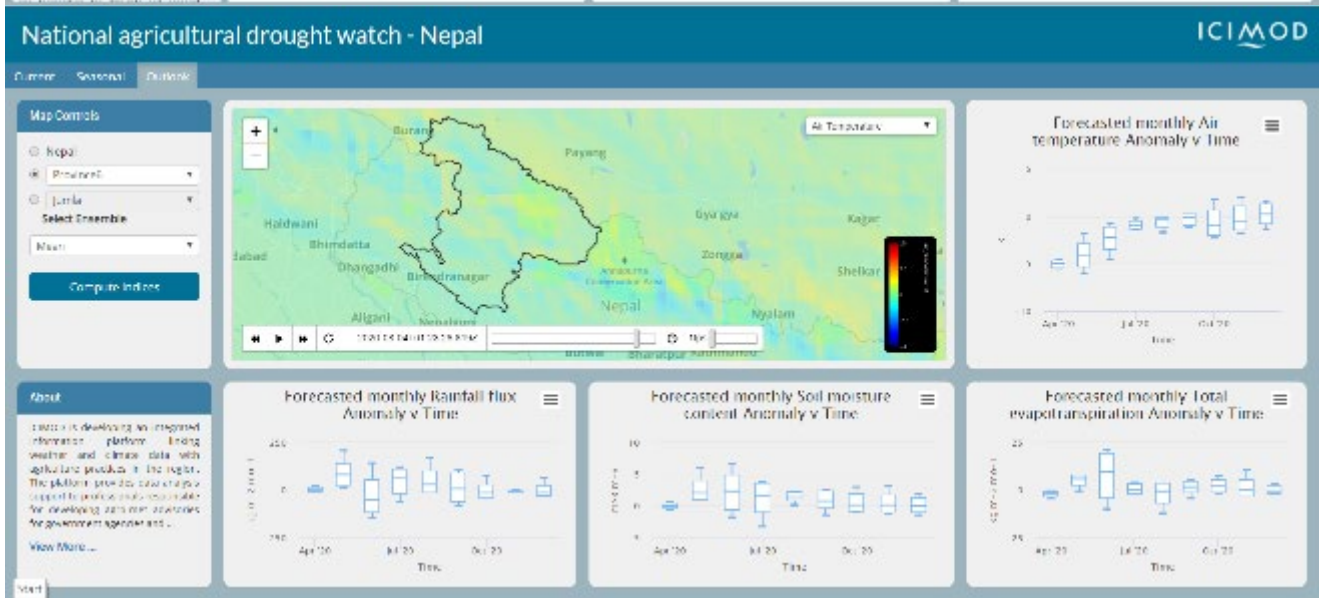
Vegetation condition in the croplands during March 2021

http://tethys.icimod.org/apps/droughtnp/



Declaration of national drought emergency Presidential office; Rangelands Directorate used for farmer aid assistance planning



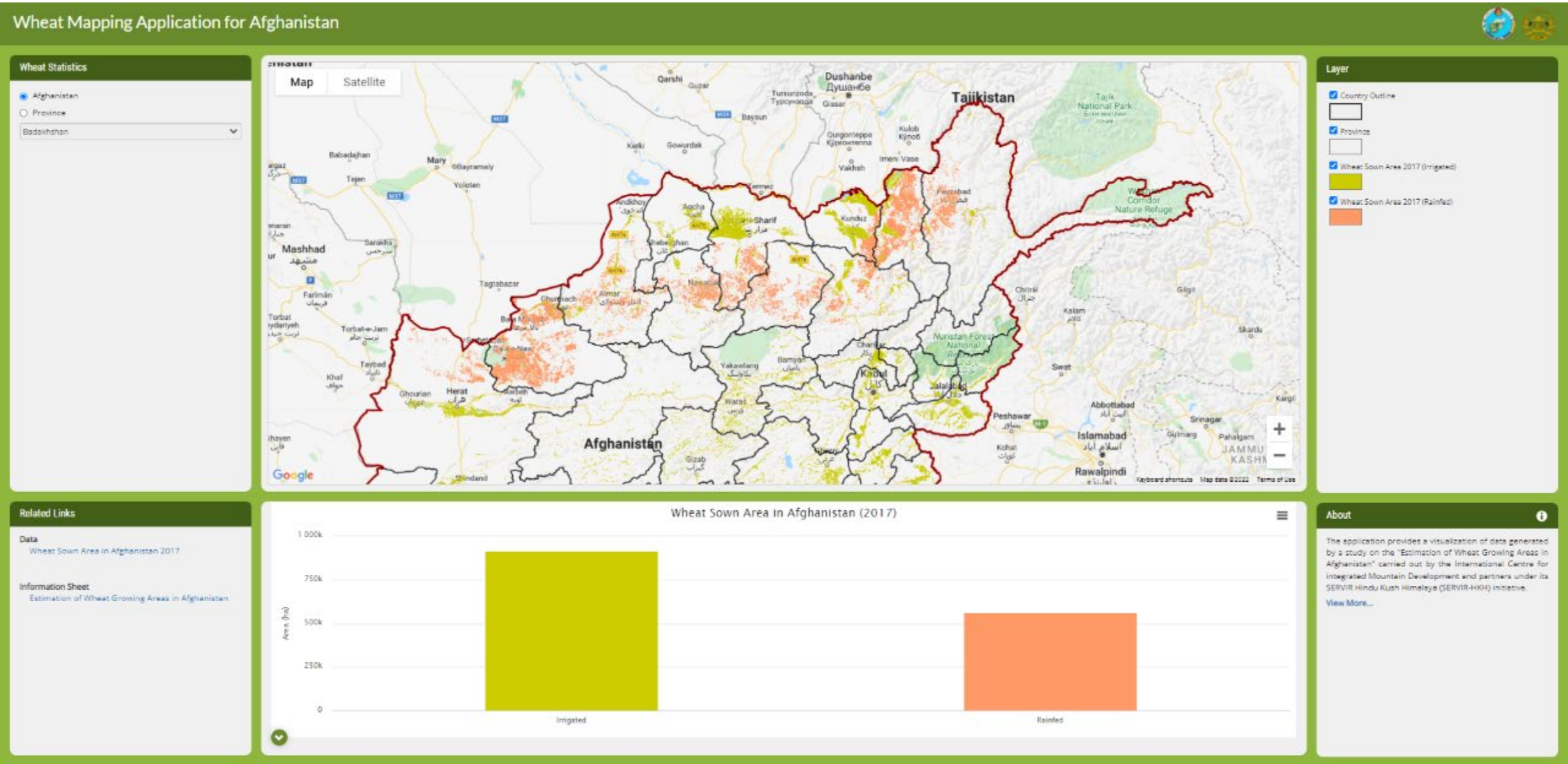


In-season crop area mapping

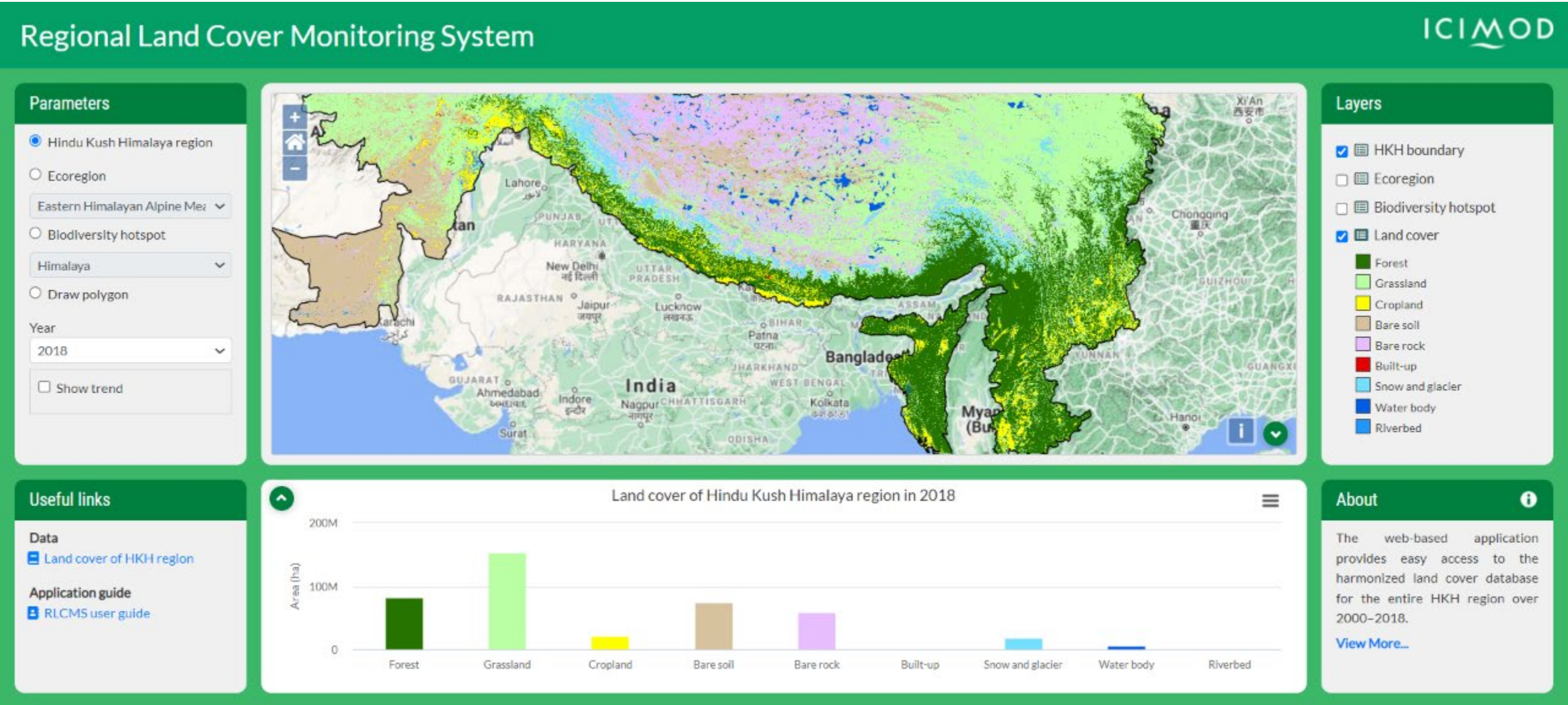
- Crop area mapping of rice area in Terai region completed with MoALD
- GeoFairy mobile app for field data
- Methodology development for yield estimation

Rice area in Terai districts of Nepal

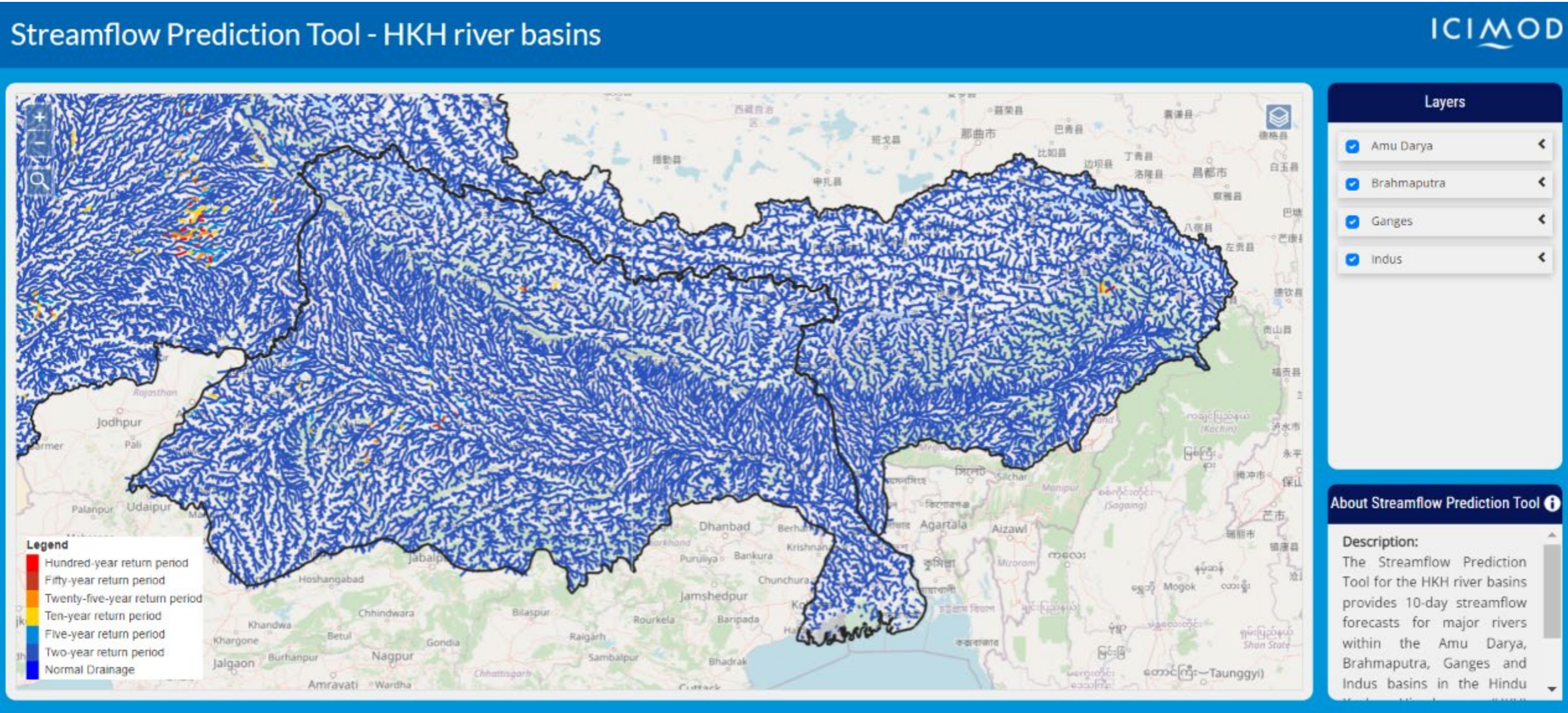
Wheat mapping in Afghanistan



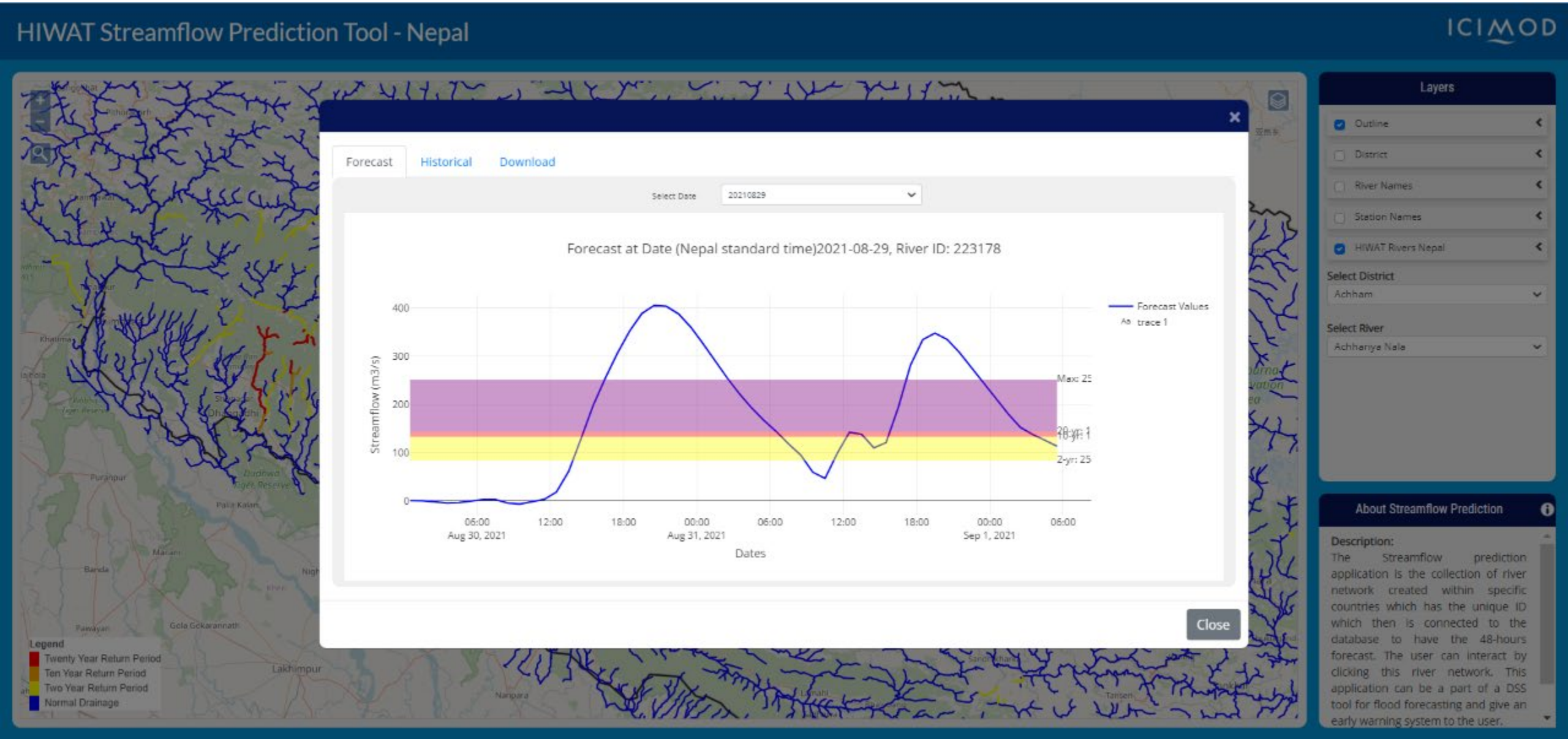
Land cover monitoring system



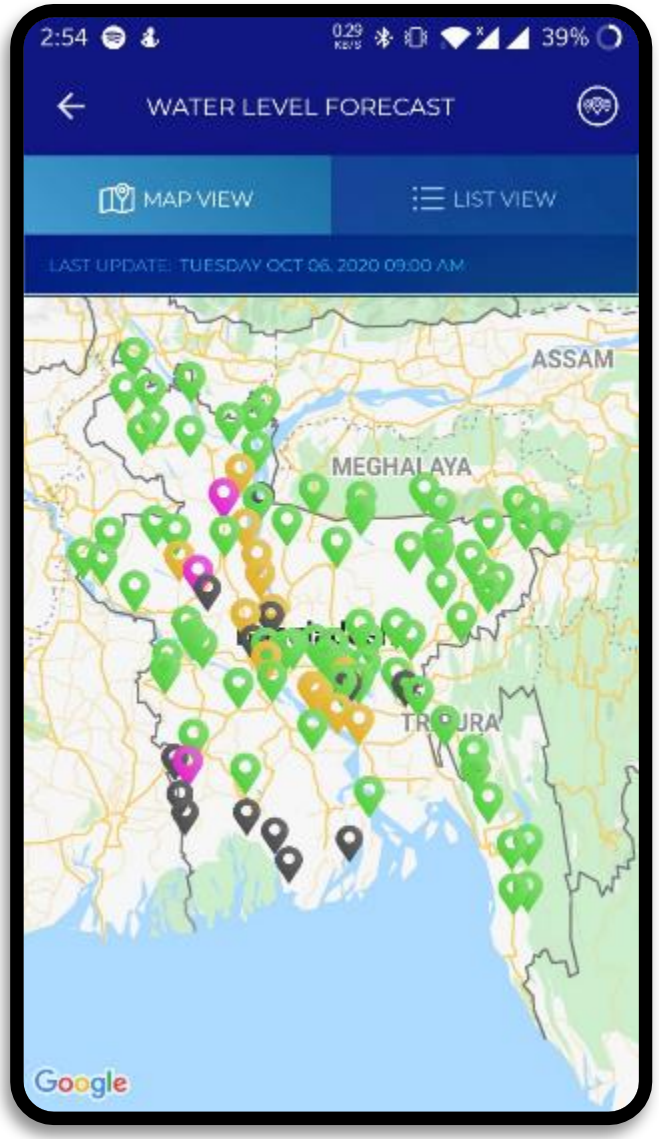
Improving flood forecasting and early warning



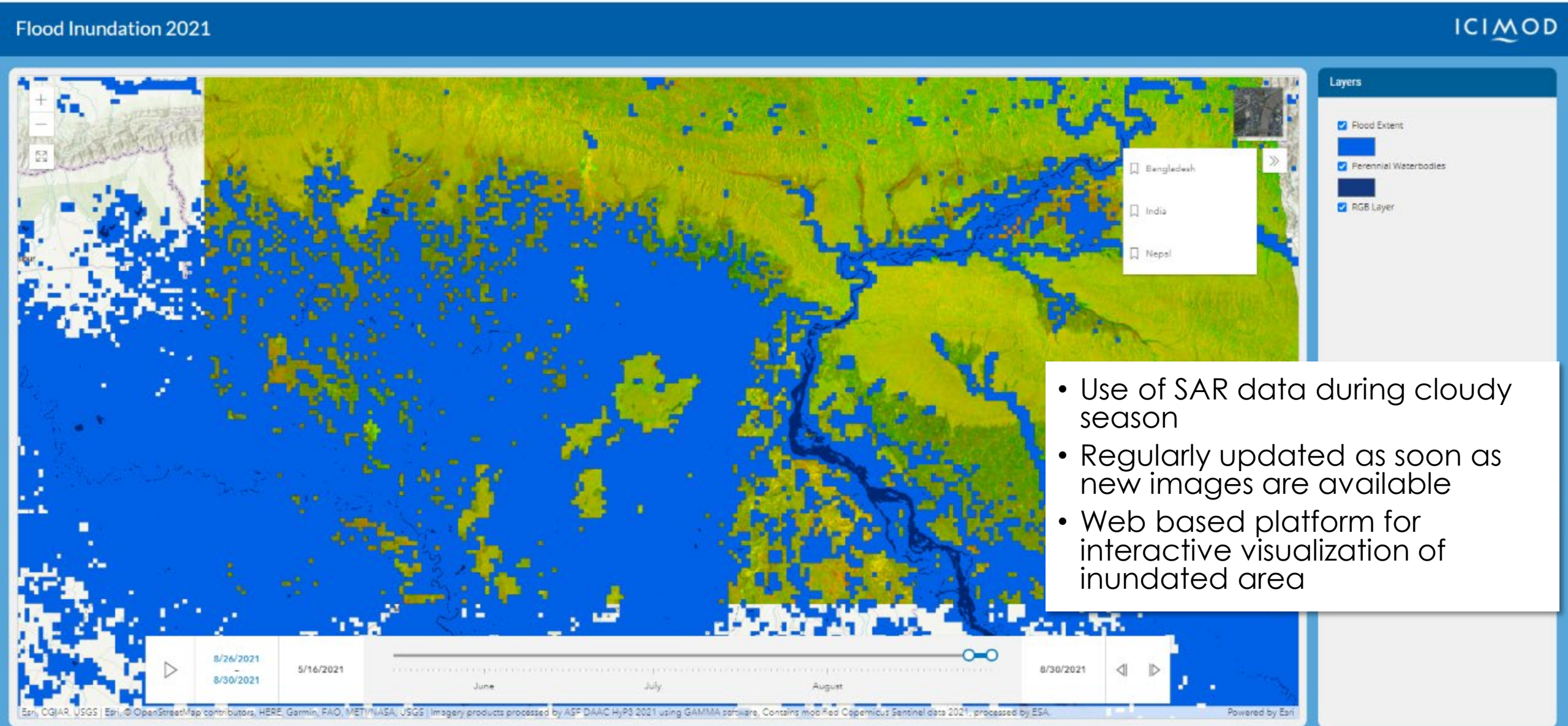
Improving flood forecasting and early warning



Mobile app for flood early warning



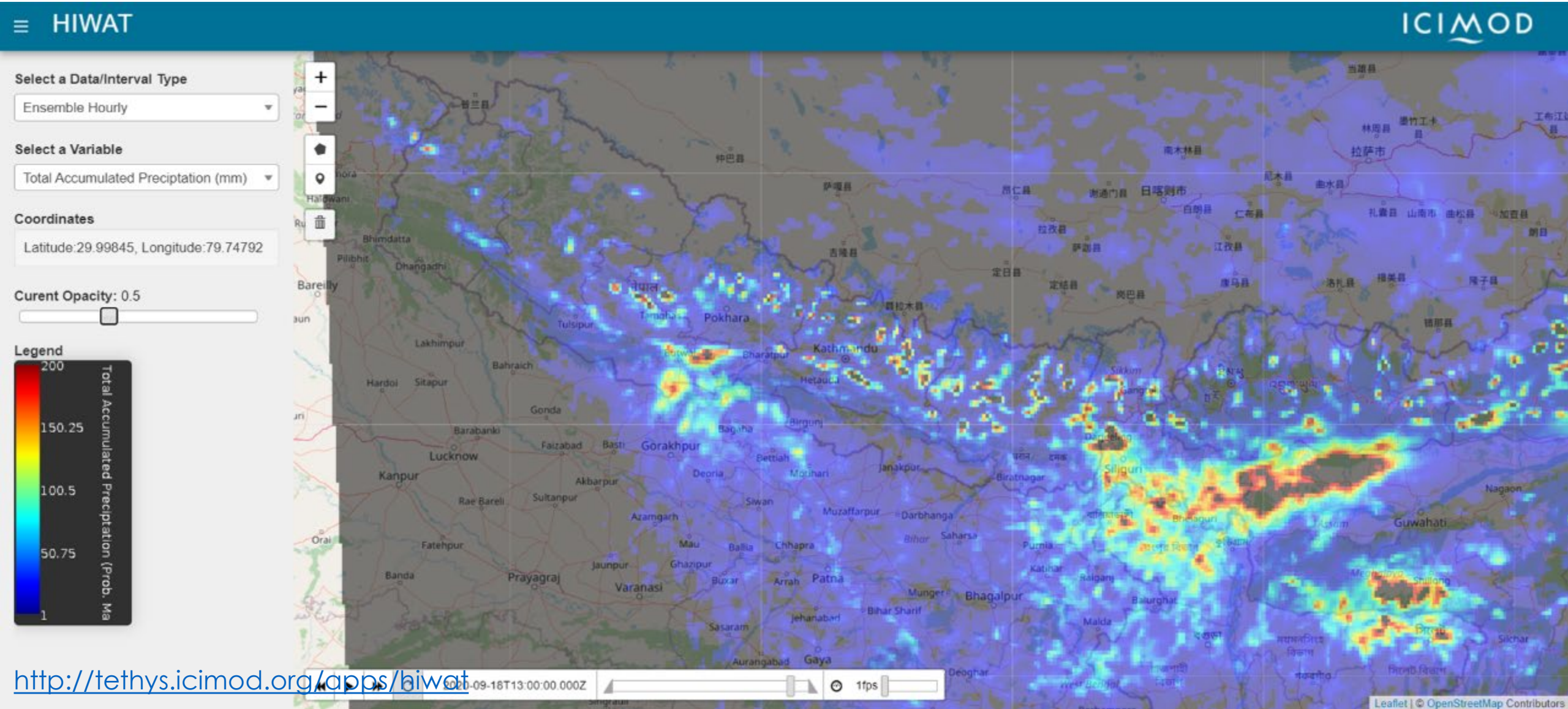
Flood inundation monitoring



- Use of SAR data during cloudy season
- Regularly updated as soon as new images are available
- Web based platform for interactive visualization of inundated area

Weather and climate

- High Impact Weather Assessment Tool (HIWAT)

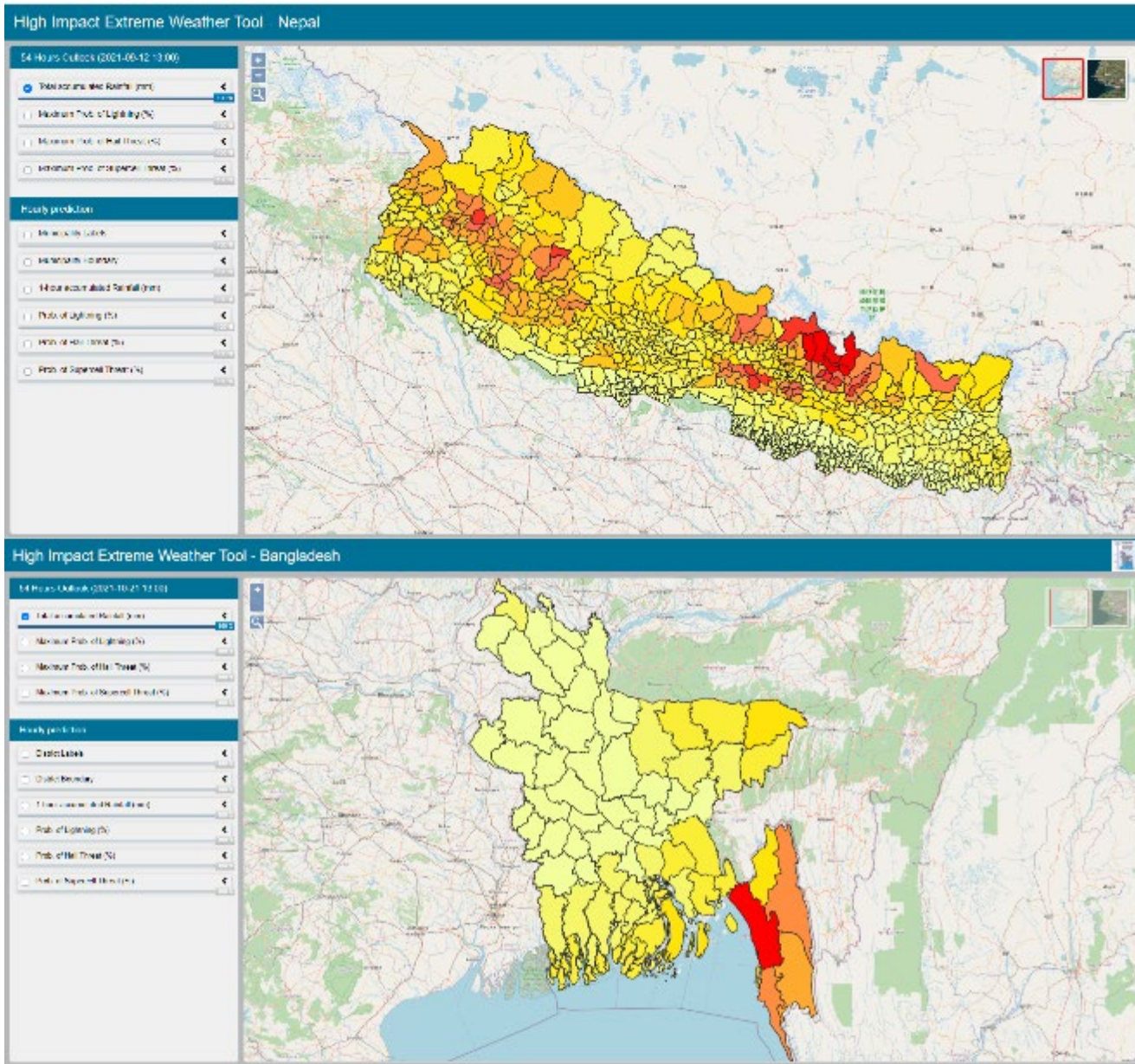


http://tethys.icimod.org/apps/hiwat

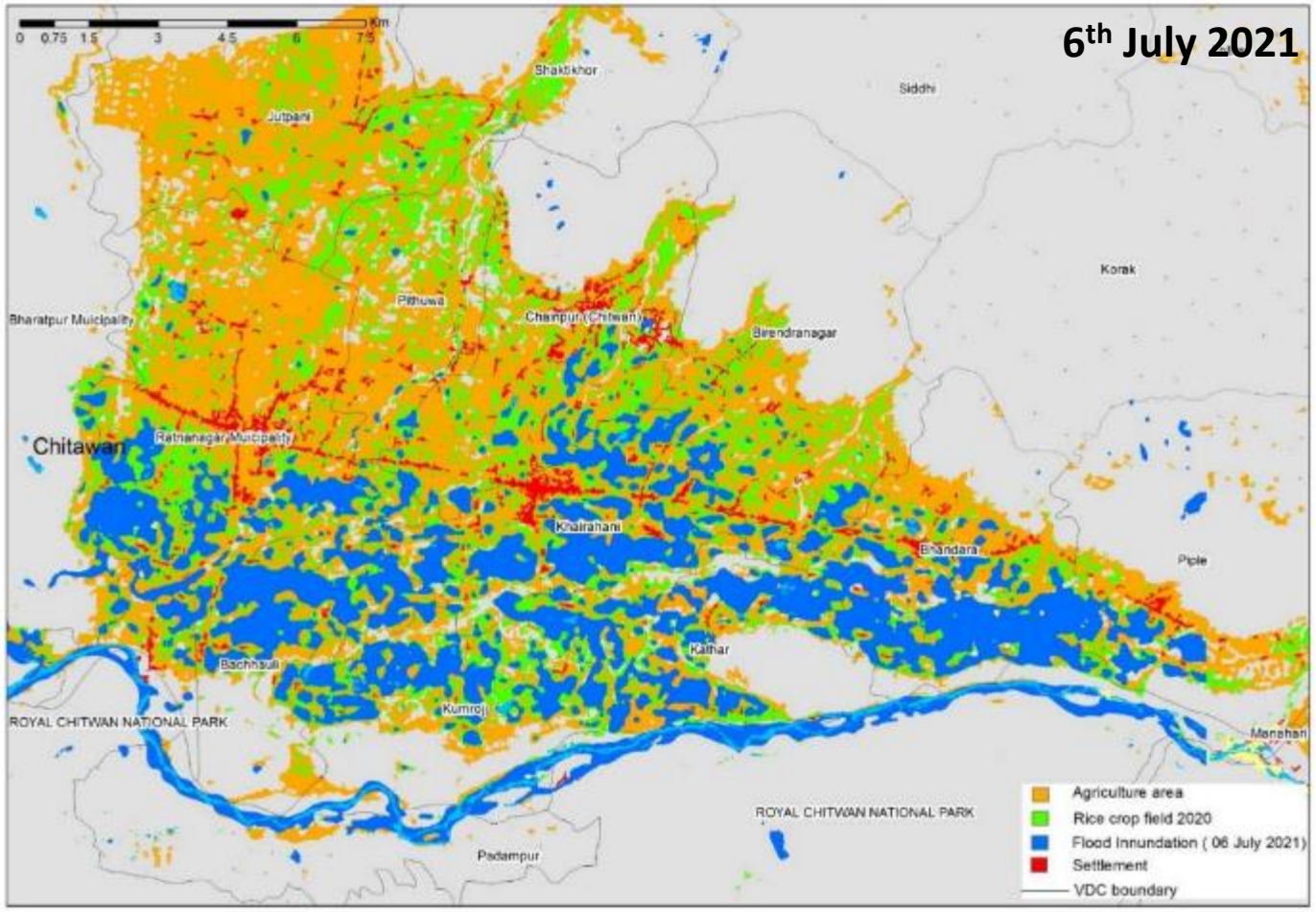
Visualization for local use

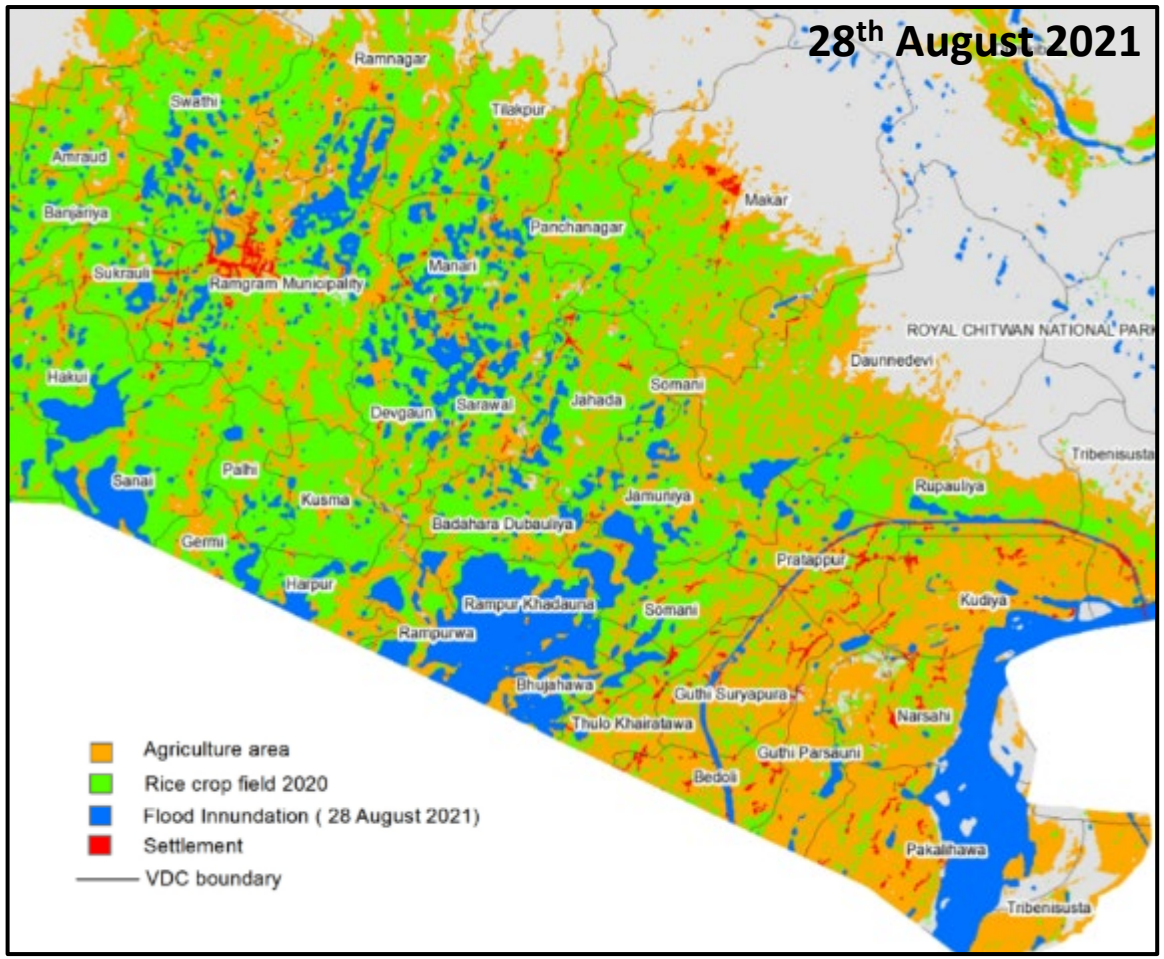
Prediction for next 54 hours

- Rainfall
- Lightening
- Hail
- Wind
- Supercell storms



Rapid response mapping for flood inundation in croplands

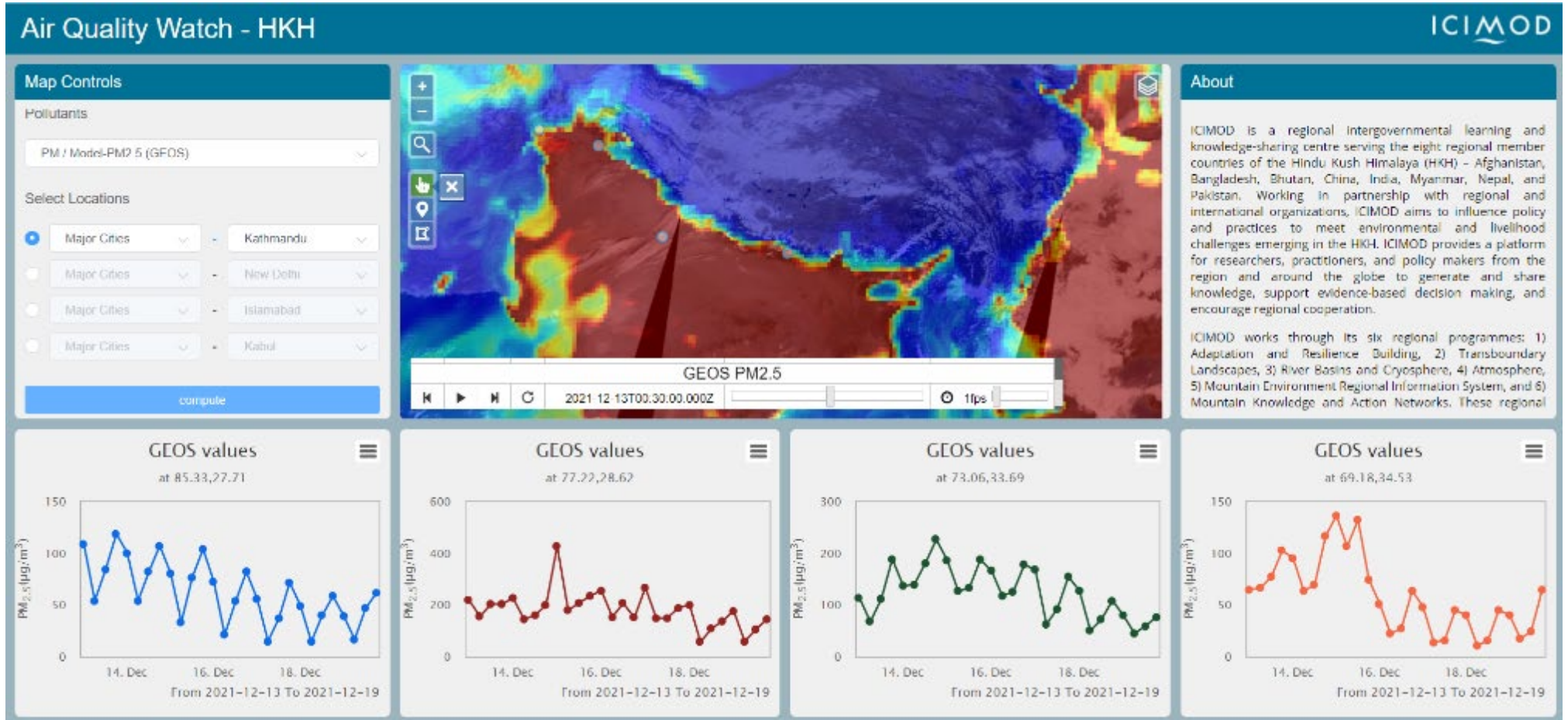




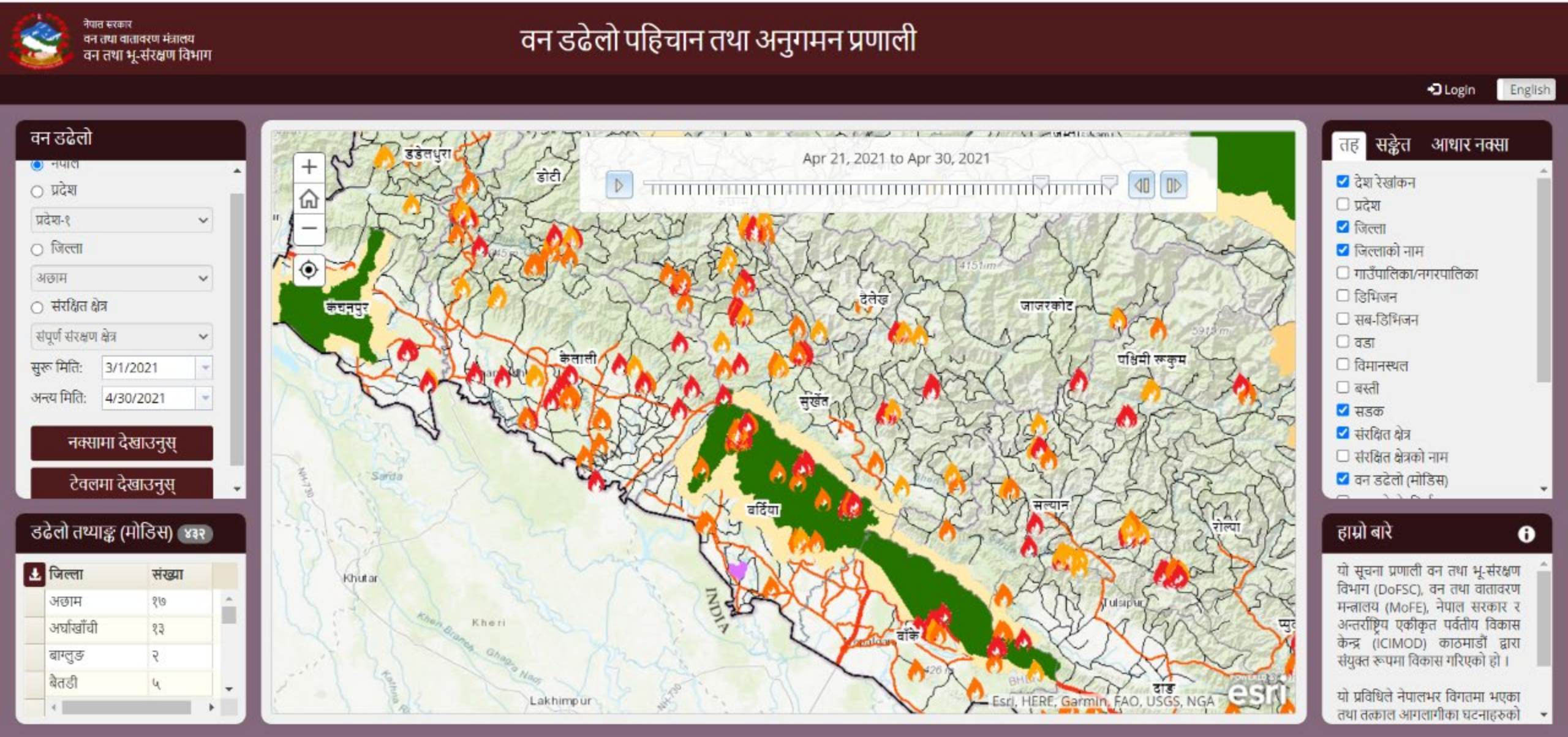
Air quality monitoring and management

- Innovative air quality products using models, satellite data, and monitoring stations for dust, AOD and trace gases

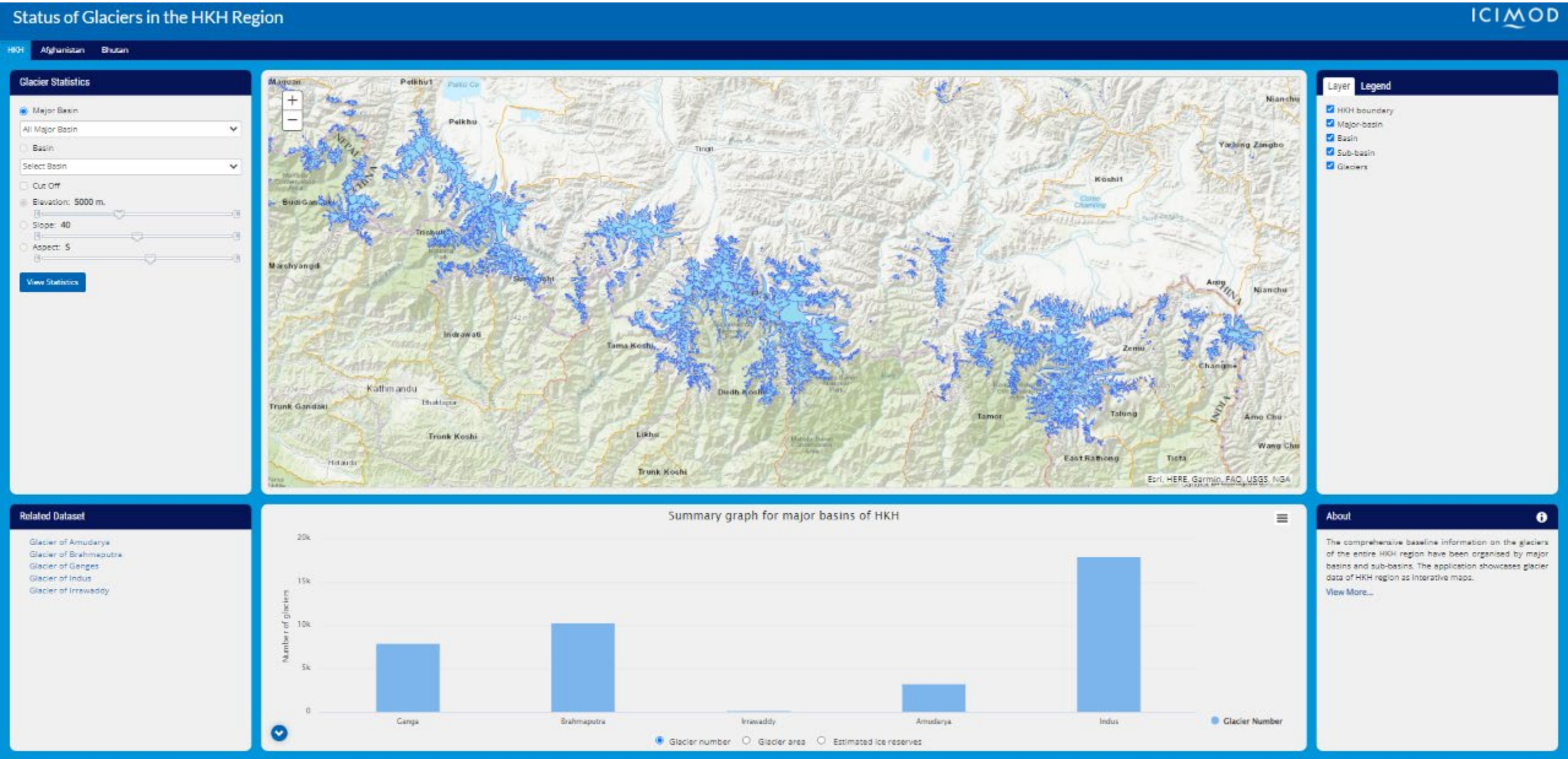
  http://smog.icimod.org/apps/airquality/ (Hosted in ICIMOD)



Forest fire monitoring system



Glacier mapping of the HKH region



Glacier and glacial lake dynamics

Capacity building

- Courses designed on specific applications/ services
- Different types of trainings
  - Structured Training
  - On the Job Training
  - Training of Trainers
  - Policy dialogs

Training for REDD IC, April 2021

Training for Armed Police Force, 31 Aug 2021

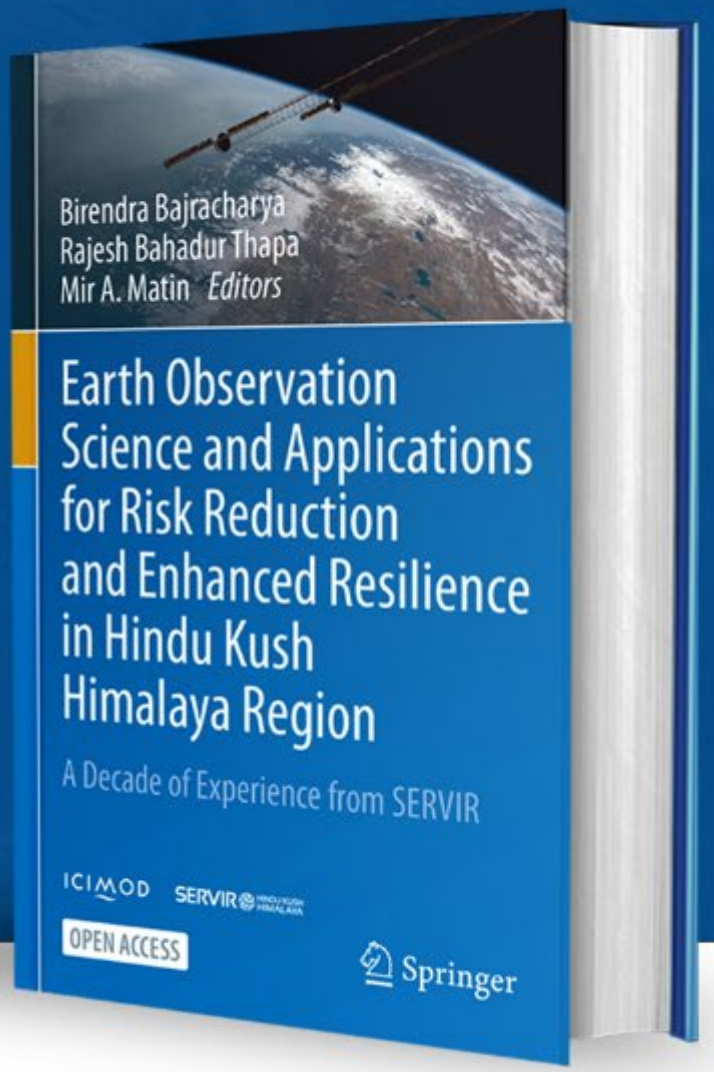
Capacity building

Participants in different work environments during the training

Knowledge products

Earth Observation Science and Applications for Risk Reduction and Enhanced Resilience in Hindu Kush Himalaya Region

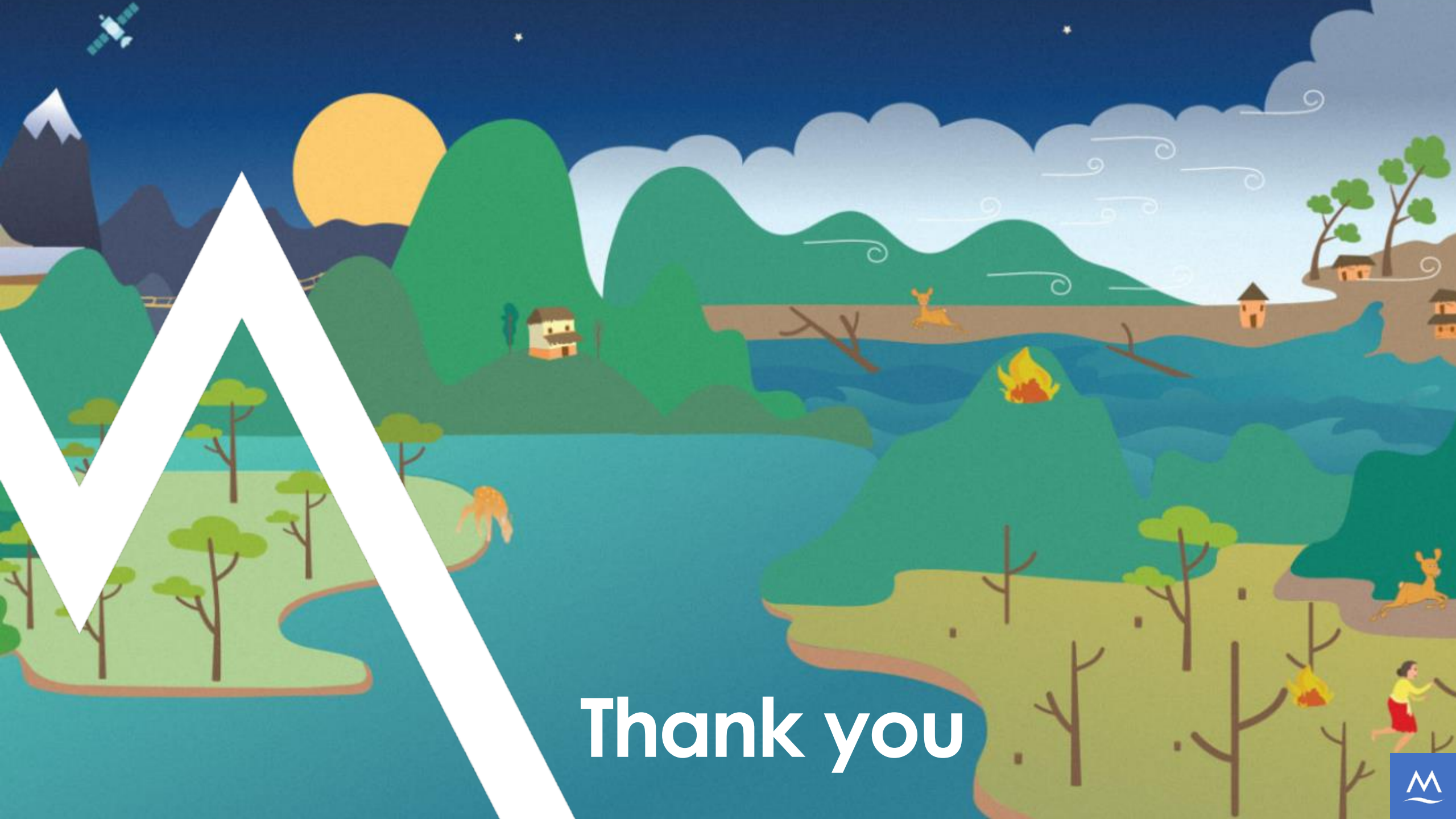
A Decade of Experience from SERVIR



USAID FROM THE AMERICAN PEOPLE NASA ICIMOD SERVIR HKH

Conclusion

- Opportunities for applications of EO in the HKH region are highly influenced by global trends and priorities set of nations
- Unprecedented growth on EO applications for environmental monitoring and climate change due to temporal and geographic coverage of satellites and advancements in computing facilities
- Satellite data are becoming easily accessible (e.g. Landsat, Sentinel)
- Platforms like Group on Earth Observation (GEO) are promoting space applications for societal benefits and monitoring SDG indicators
- More countries in the region are initiating space applications and growing opportunities for collaboration on transboundary issues, technology exchange, and capacity building


Thank you