

SERVIR's efforts on application of EO and Geospatial Technologies for DRR in the HKH



Birendra Bajracharya
Chief of Party
SERVIR-HKH, ICIMOD

What we have been reading these days

Natural disasters and extreme weather + South and Central Asia

August 2020



Pakistan floods: at least 90 killed in monsoon rains

26 Aug 2020



Monsoon rains driven by high winds bring flooding misery to Mumbai

6 Aug 2020

July 2020



'A critical situation': Bangladesh in crisis as monsoon floods follow super-cyclone

Despite flood planning efforts hundreds have been killed and millions hit as third of land is submerged by non-stop rain

24 Jul 2020



Flooding in Assam and Nepal kills hundreds and displaces millions

Hurried evacuation of millions of residents will increase coronavirus cases, officials say

20 Jul 2020

The New York Times

Dozens Feared Dead as Nepal Landslides Wipe Out Homes

Many in the region had only just rebuilt homes that were damaged by a powerful 2015 earthquake. The country is also facing an economic crisis brought on by the coronavirus pandemic.



Many more were still missing after heavy rains led to landslides in the hilly Sindhupalchok district of Nepal over the weekend. Niroj Chaoulagain/Agence France-Presse — Getty Images

<https://www.theguardian.com/world/natural-disasters+south-and-central-asia>

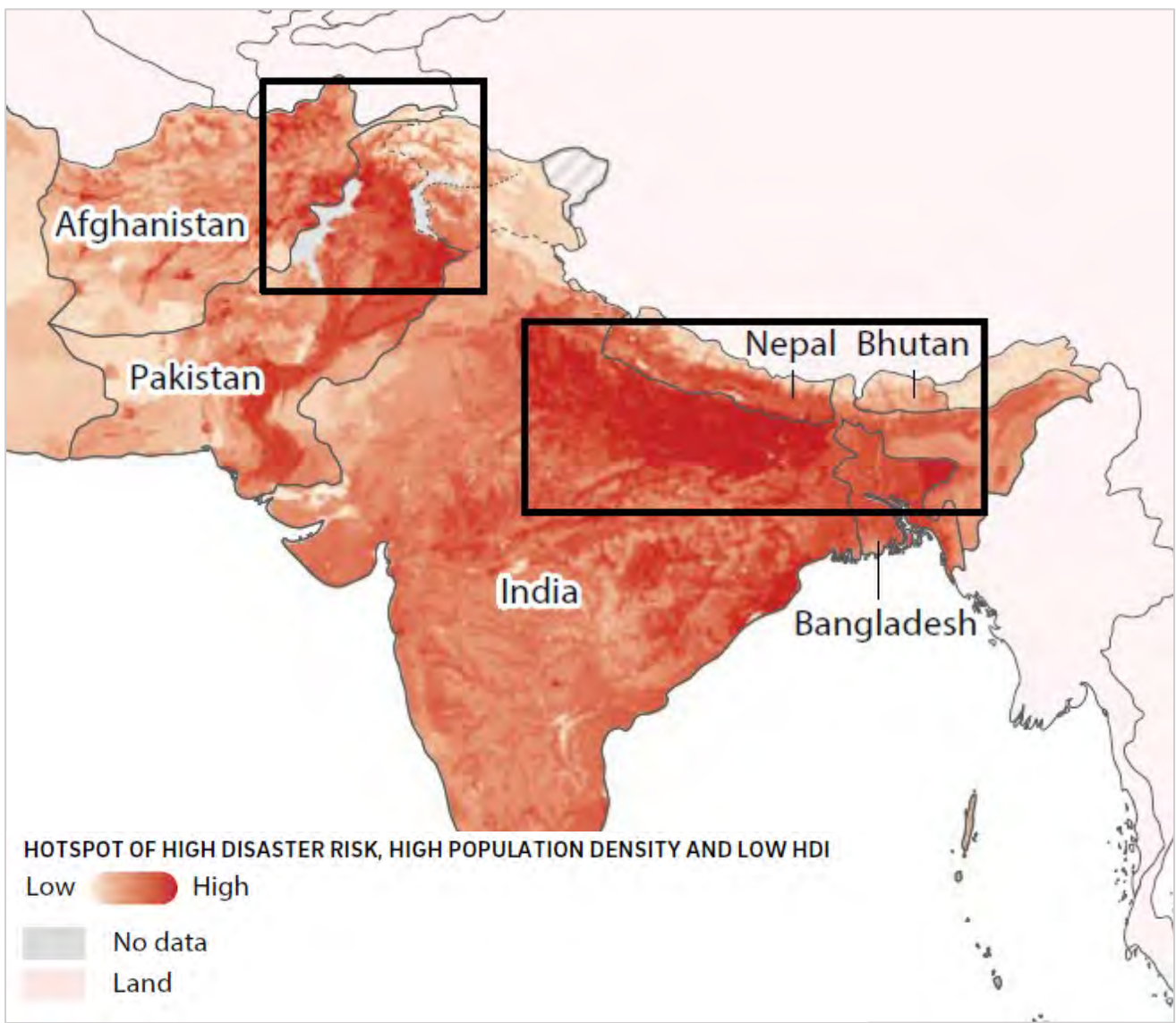


Disaster in Asia Pacific Region



- Average annual economic loss of \$675 billion
- Increase in the number of people affected who require immediate assistance during a period of emergency
- Number of deaths from climate-related events is decreasing, probably due to advances in technology, as well as a growing experience and expertise for more effective early warning systems

Disaster in Asia Pacific Region: South Asia



HOTSPOT 1

TRANSBOUNDARY RIVER BASINS

Flood and drought prone areas, South and South-East Asia

Population exposure	Very high (mostly poor)
Economic stock exposure	High
Infrastructure: energy	Low
Infrastructure: transport	Moderate
Infrastructure: ICT	Low

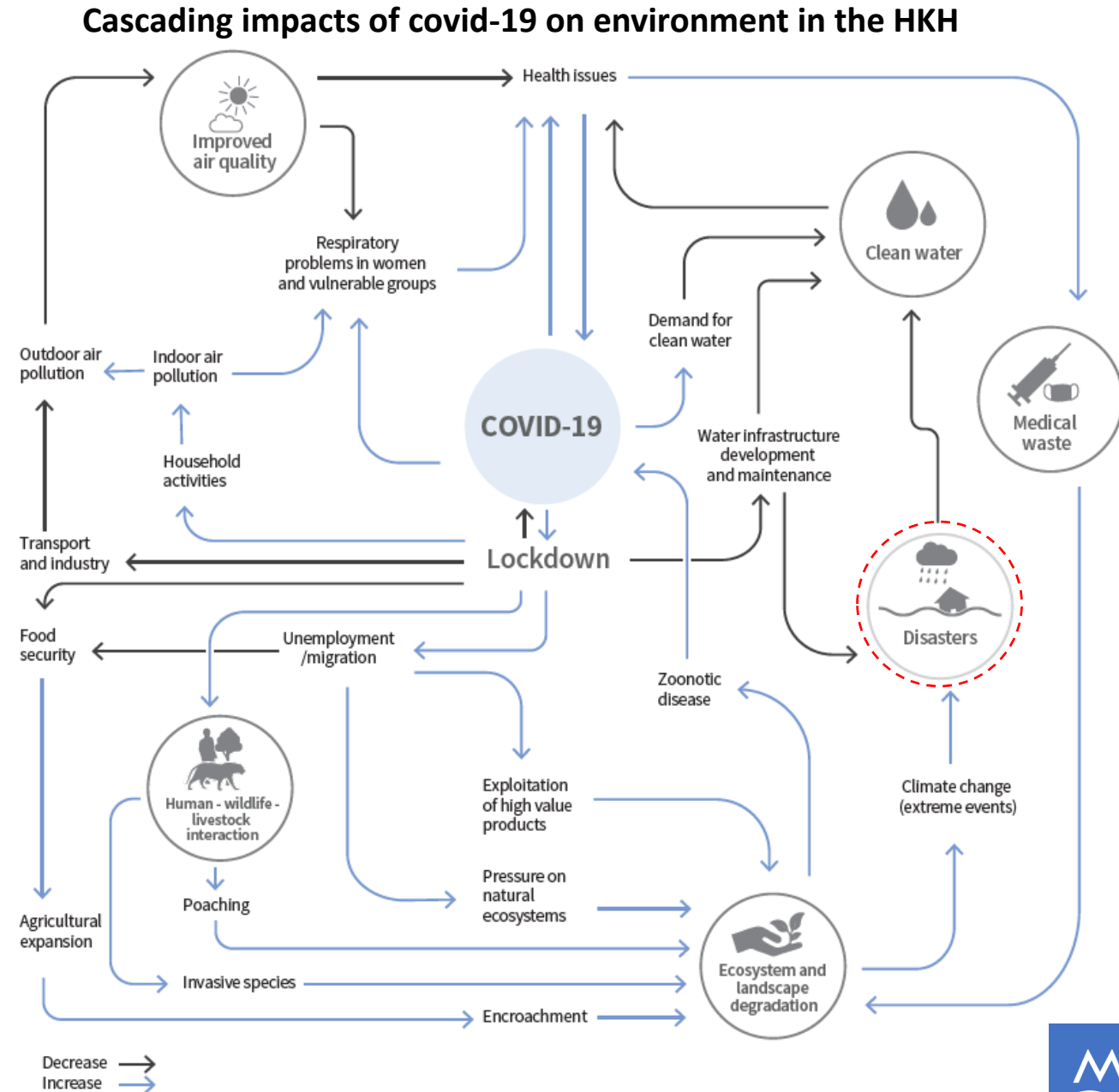
Hindu Kush Himalaya region



Source of
**10 major Asian
river systems**

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

Covid-19 Scenario



A partnership of NASA, USAID, and leading regional organizations, SERVIR develops innovative solutions using Earth observation and Geospatial technologies to improve livelihoods and foster self-reliance in Asia, Africa, and the Americas.



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USAID
FROM THE AMERICAN PEOPLE



adpc



CIAT

ICIMOD



RCMRD

Thematic priorities



improve food security



improve water resource management and preparedness for hydro-climatic disasters



improve sustainable land use for reduced greenhouse gas emissions



improve resilience to climate shocks and stresses



improve air quality monitoring and management



Geographic focus:

Afghanistan, Bangladesh, Myanmar, Nepal and Pakistan

SERVIR-HKH disaster related initiatives

Floods:

- Flood forecasting and early warning
- High impact weather assessment tool
- Inundation mapping

Drought

- Drought monitoring and seasonal outlook

Water and Hydro-climatic Disasters

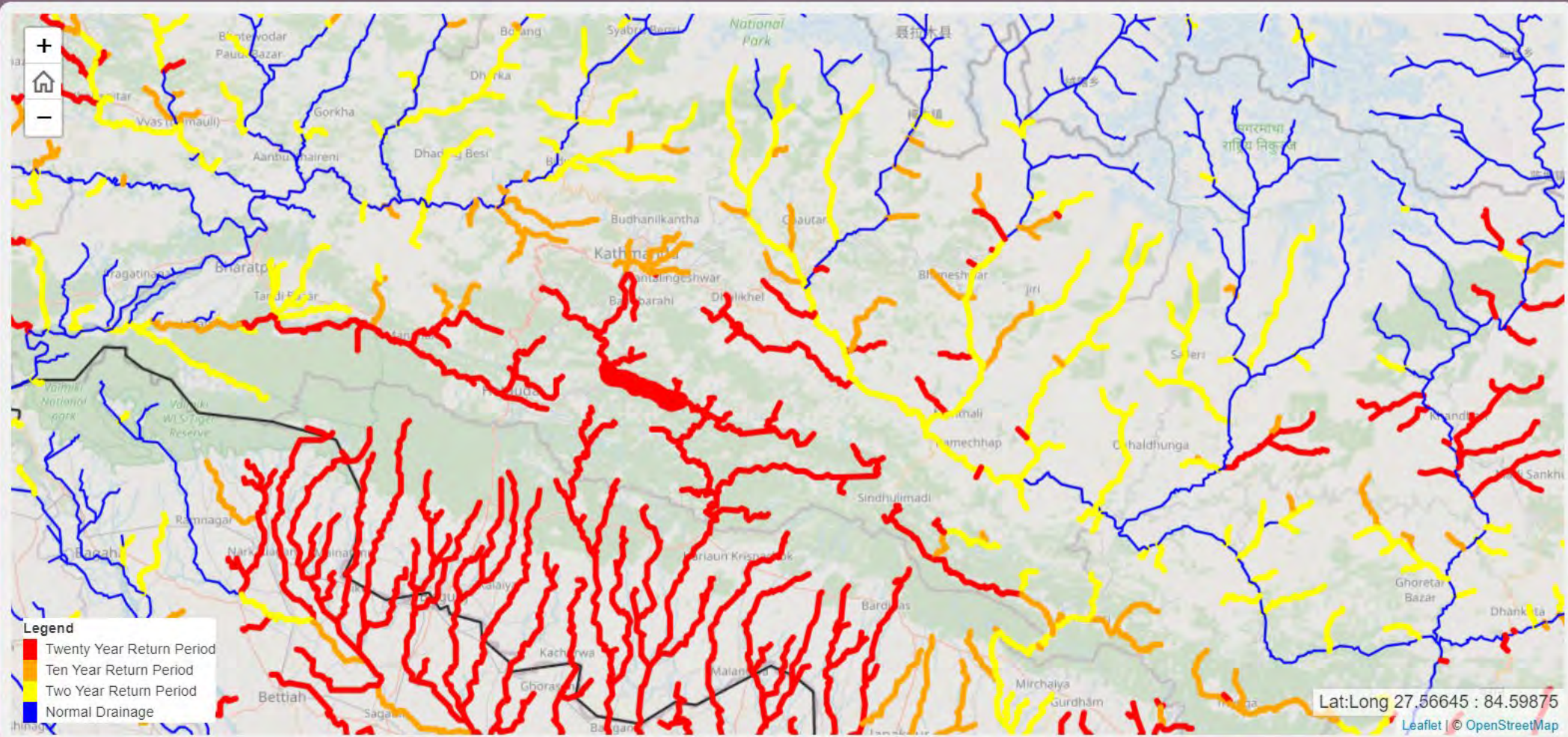


Enhancing Flood Early Warning

Co-development with Brigham Young University

ECMWF Streamflow Prediction Tool - Regional

ICIMOD



Base Layers Legend

☒ HKH Outline

About Streamflow Prediction **i**

Description:

The Streamflow prediction application is the collection of river network created within specific countries which has the unique ID which then is connected to the database to have the 15-day forecast. The user can

Enhancing Flood Early Warning

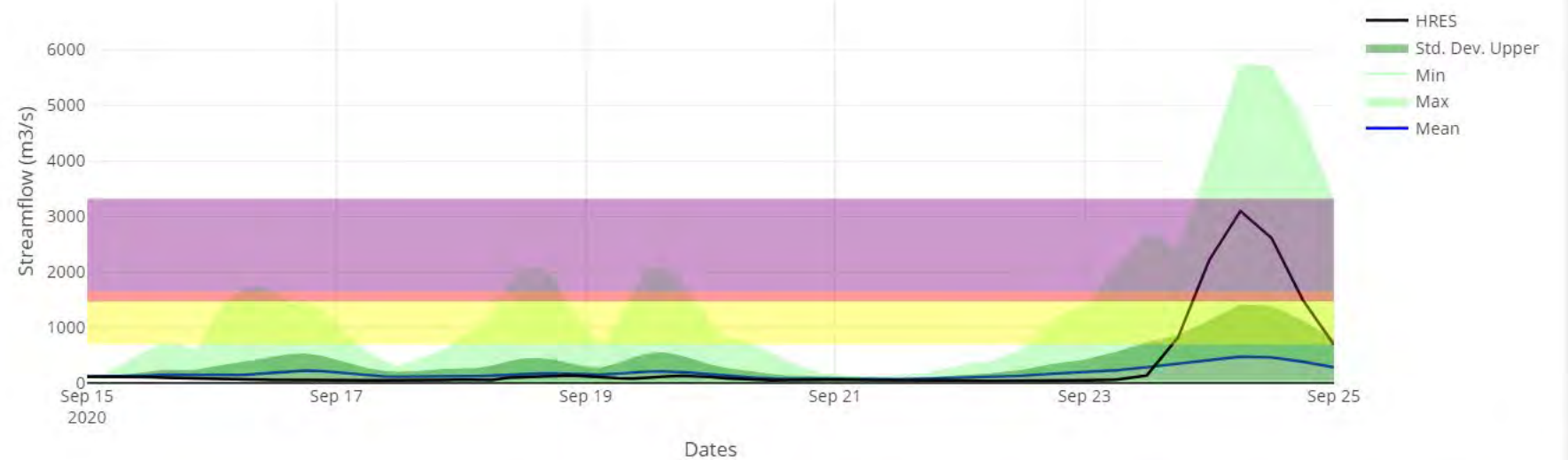
ECMWF Stream



Forecast

Downloads

Forecast at Date (Time Zone: UTC) 2020-09-15, River ID: 36168



Dates	9-15	9-16	9-17	9-18	9-19	9-20	9-21	9-22	9-23	9-24	9-25
Percent Exceedance (2-yr)	2	10	8	2	10	4	0	2	16	20	12
Percent Exceedance (10-yr)	0	4	0	2	2	0	0	0	6	14	2
Percent Exceedance (20-yr)	0	2	0	2	2	0	0	0	6	8	2

Close

ICIMOD

se Layers

Legend

HKH Outline

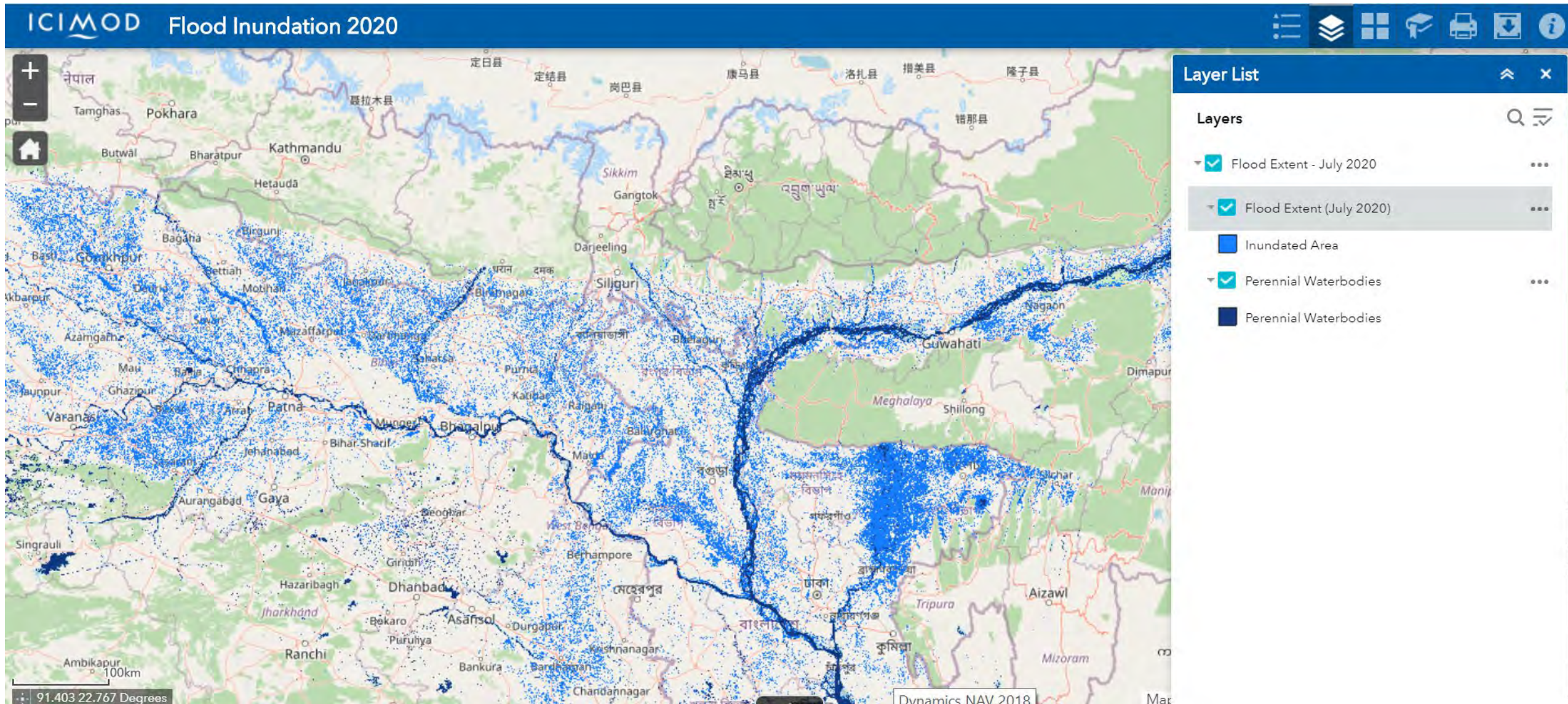
out Streamflow Prediction

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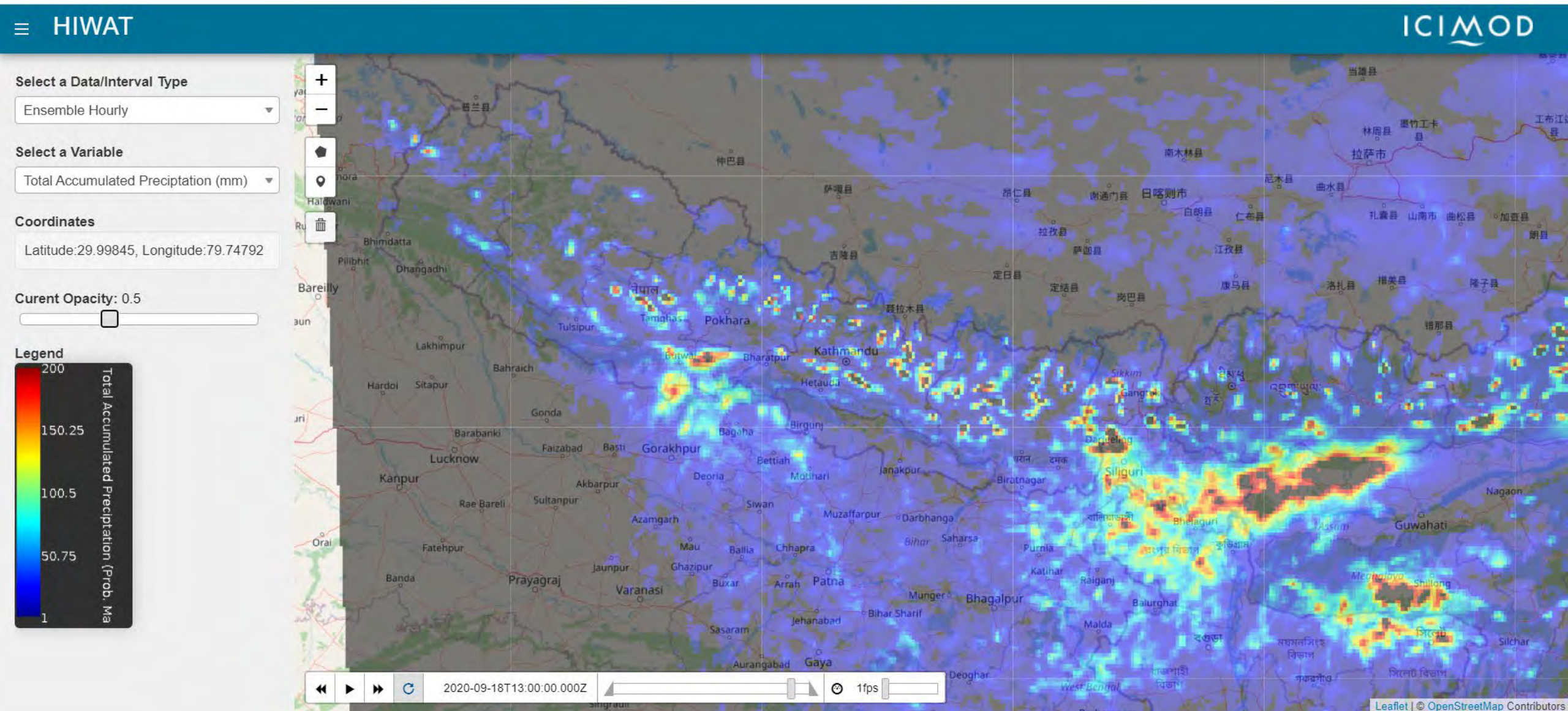
Flood inundation mapping

Co-development with University of Alaska Fairbanks



High Impact Weather Assessment Tool

Co-development with NASA-MFSC and implemented on NASA Socrates system



Reaching out to communities

- On-line applications developed on Tethys to visualize the forecasts
- A mobile app for disseminating Flood early warning in Bangladesh
- Integration with hydrodynamic modeling in Bangladesh

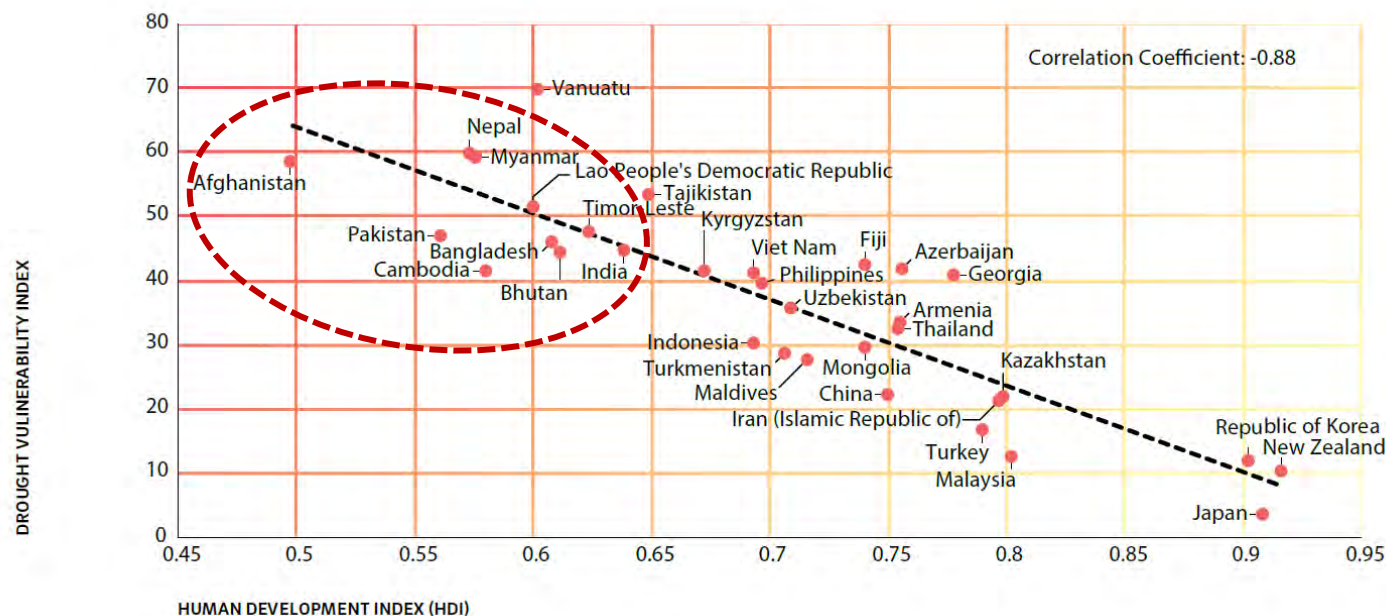


Regional Drought Monitoring

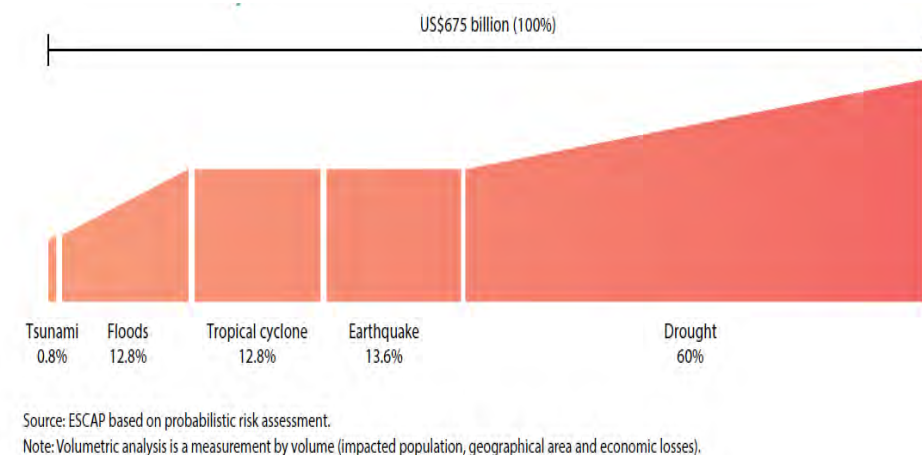


Drought in the HKH

Influence of drought vulnerability on human development index



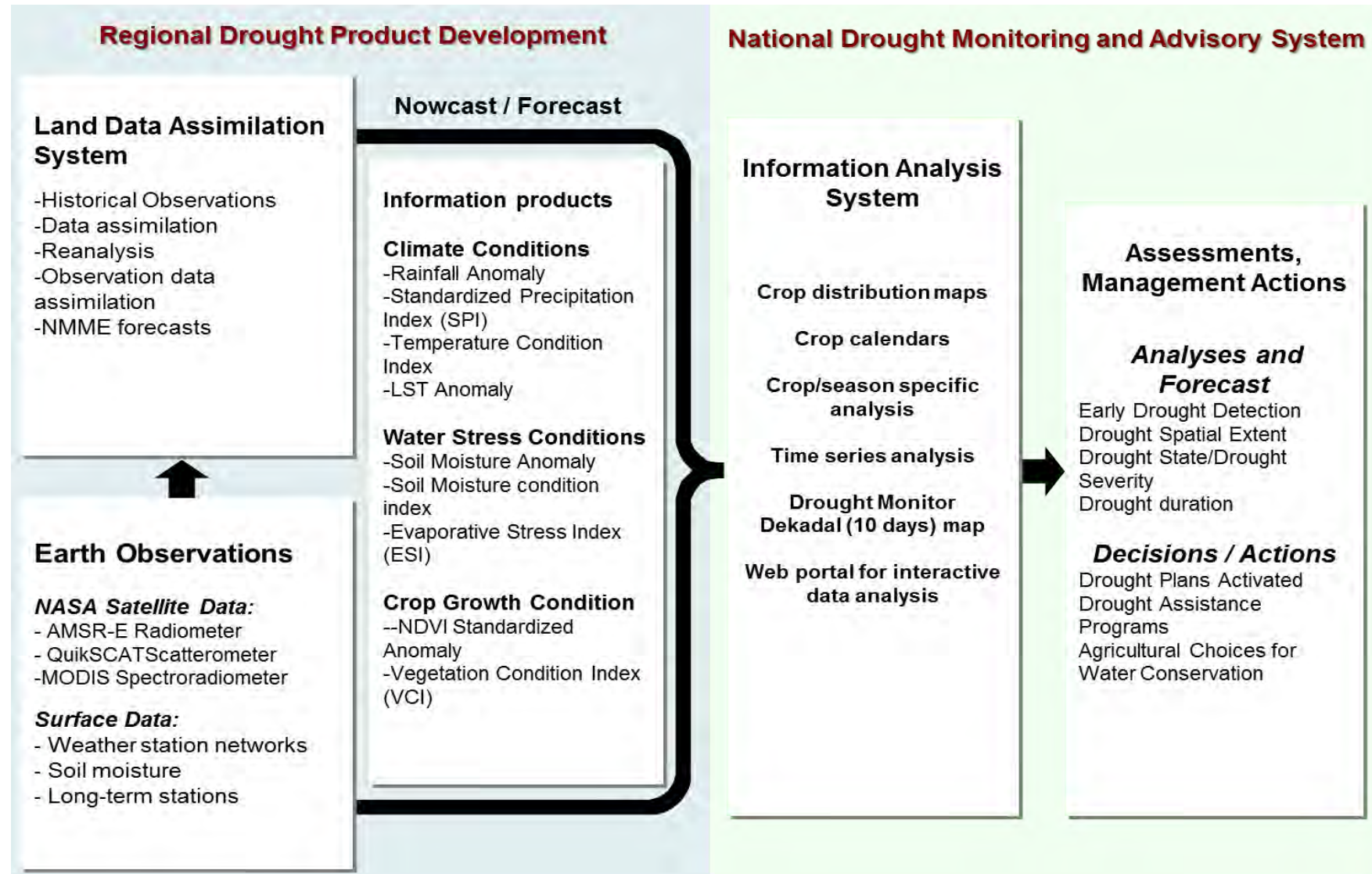
Asia-Pacific regional riskscape (average annual losses)



UNESCAP (2019) The Disaster Riskscape Across Asia-Pacific, Pathways for Resilience, Inclusion and Empowerment, Asia-Pacific Disaster Report 2019



Framework of Drought Monitoring and Outlook System



Regional Drought Monitoring and Outlook

Co-development with John Hopkins University

Regional Drought Monitoring and Outlook System for South Asia

ICIMOD

Current Outlook

Map Controls

Basin

Brahmaputra

Select Indices

Soil moisture content

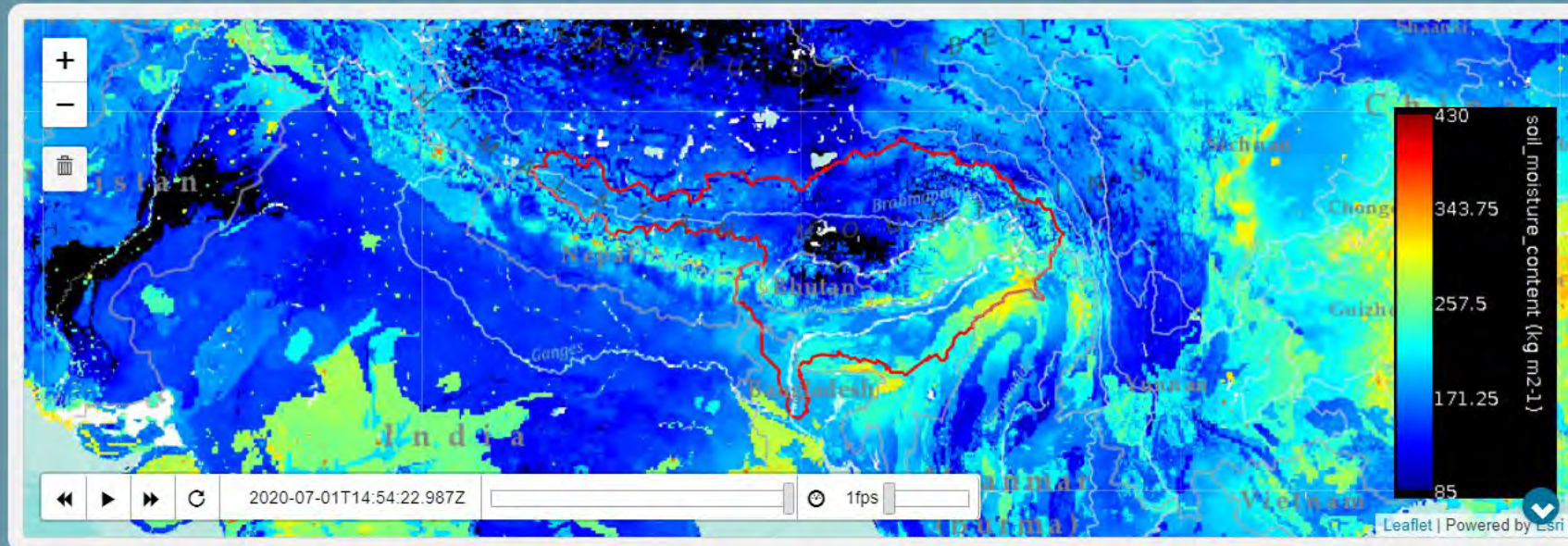
Select Periodicity

Monthly Anomaly

Select Year

2020

Get Current Average

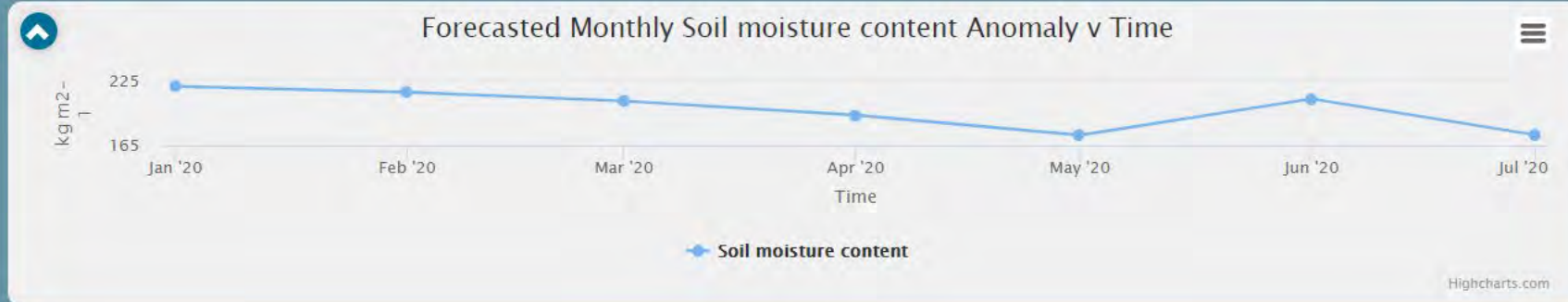


Base Layers

- ☒ SALDAS Layer
- ☒ Major Basin

Useful Links

[Streamflow Prediction - Bangladesh](#)
[Streamflow Prediction - Nepal](#)
[Hiwat Extreme Climate](#)
[Regional Database System](#)
[Agriculture Information Portal](#)



About

National drought monitoring system used five parameters (soil moisture, precipitation, air temperature, evapotranspiration and standard precipitation index) from SALDAS dataset as the drought indicators, which is

National Drought Monitoring and Outlook

National agricultural drought watch - Nepal



Current Seasonal Outlook

Map Controls

☐ Nepal

☒ Province2

☐ Dolpa

Select Sowing Year

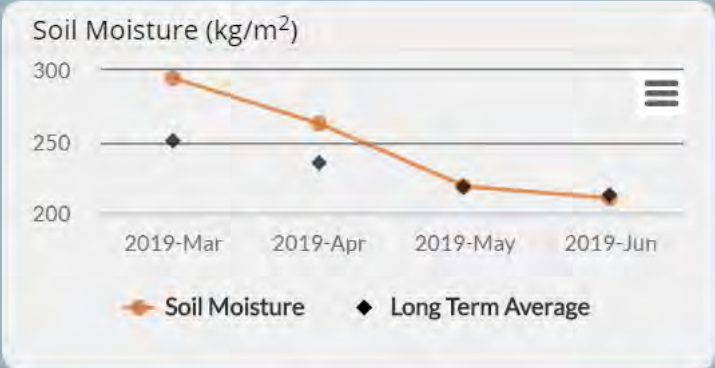
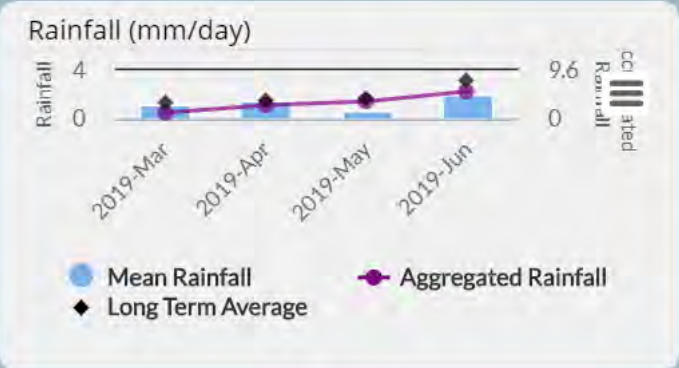
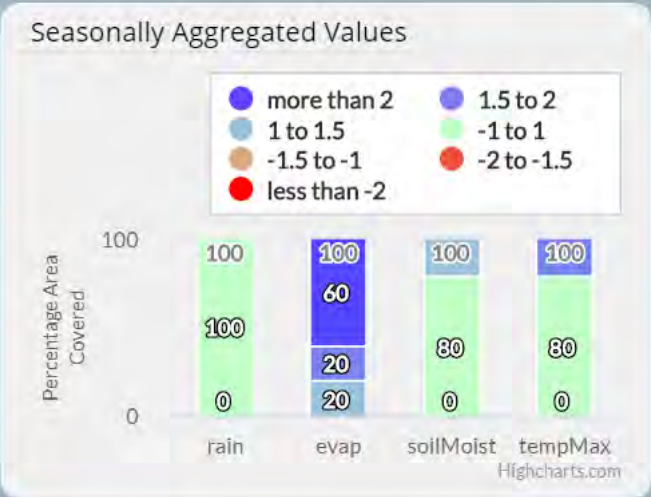
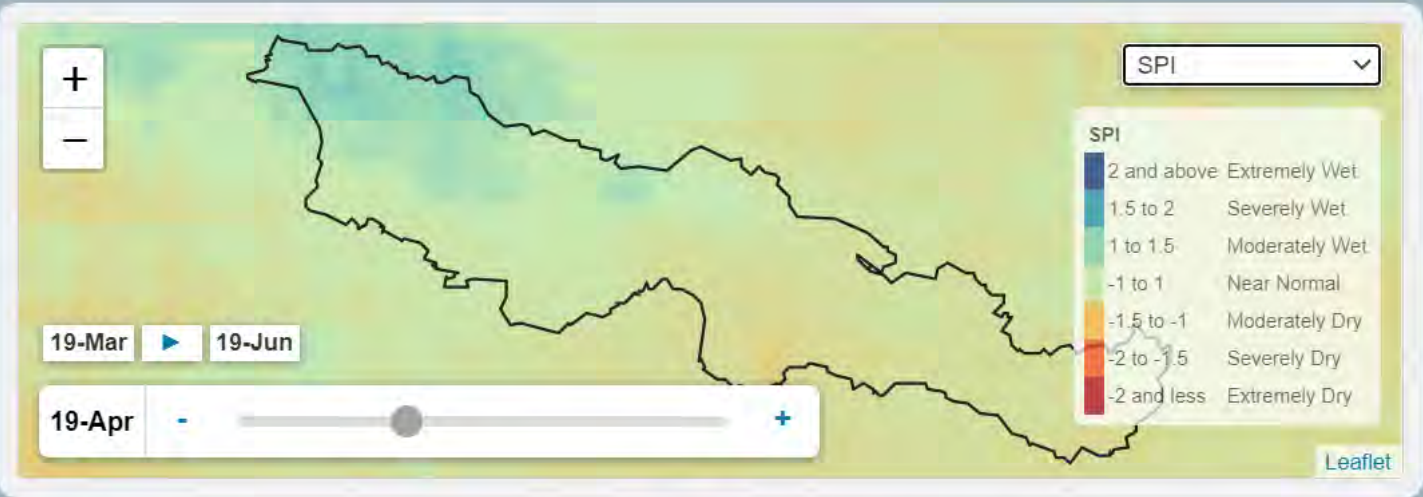
2020

Select Date Range

01/20208/2020

About

ICIMOD is developing an integrated information platform linking weather and climate data with agriculture practices in the region. The platform provides data analysis



Capacity building

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

Looking to the skies: Women in Pakistan learn to integrate geospatial information technology into their fields

08 Sep 2020



Empowering women in geospatial information technology – Pakistan
14–17 July 2020

26 selected women from Pakistan successfully completed the "Empowering women in GIT – Pakistan" training remotely during the COVID-19 pandemic

Download training material from bit.ly/womenGITPak

servir.icimod.org

USAID NASA ICI MOD SERVIR-HIKH

Capacity building

“Connecting space to village”

- Training of school teachers
- Refresher training
- Supporting small projects



SERVIR  HINDU KUSH
HIMALAYA

ABOUT

THEMATIC FOCUS

SCIENCE APPLICATIONS

CAPACITY BUILDING

FOCUS IN AFGHANISTAN

A bearer of tidings: Teacher uses ICIMOD science application to help avert disaster in Dhading, Nepal

25 Aug 2020



Ongoing remediation work in Dhading in the aftermath of the floods. (Photo received courtesy of Parashu Ram Ghimire, Information Officer, Benighat Rural Municipality.)

Conclusion

- More people and infrastructure are at risk of exposure to increasing frequency and intensity of natural hazards in the HKH
- Advancement in science and technology has created more opportunities to improve early warning and disaster preparedness
- Communication mechanisms to disseminate right information at right time is crucial
- Capacity building at local levels can make a big difference in saving lives and properties
- More extensive and effective regional cooperation by sharing data, information, and scientific and indigenous knowledge needed for disaster risk reduction practices



Thank you