



**24<sup>th</sup> session of ICC on RESAP  
18-19 August 2020**

# **Space Applications for Bhutan**

## **Ministry of Information and Communications, Bhutan**



# Outline

- ❖ Space Applications Currently used in Bhutan
- ❖ Possible use of Space Application in Bhutan
- ❖ Challenges in Implementation
- ❖ National Space Policy
- ❖ Request to UNESCAP
- ❖ Good Practices in combating covid-19 and lessons learnt



# Space Application Currently used in Bhutan

- ❖ Disaster risk reduction and resilience
  - VSAT network for emergency communications using SAS<sup>1</sup> transponder
    - 80 VSAT installed across the country for emergency communications



*VSAT terminal installed  
in one of the remote sites*



*SAS hub station antenna*

<sup>1</sup>SAS - South Asia Satellite, launched by India in 2017.





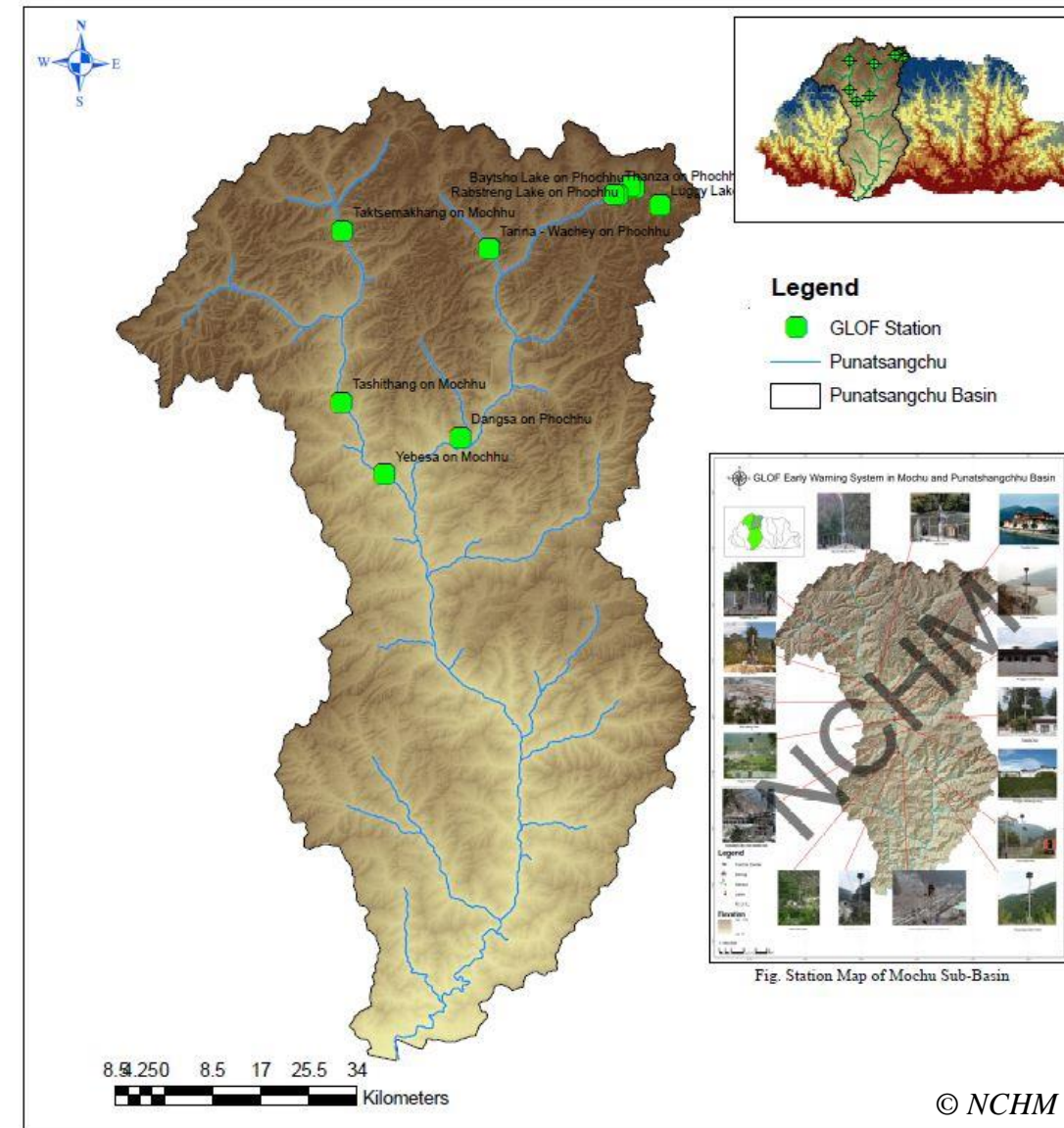
# Space Application Currently used in Bhutan

- ❖ Disaster risk reduction and resilience
  - GLOF EWS<sup>2</sup> using Iridium constellation
    - About 17 GLOF stations installed
    - 25 potentially dangerous lakes



*Potentially Dangerous Lakes of Bhutan*

© NCHM

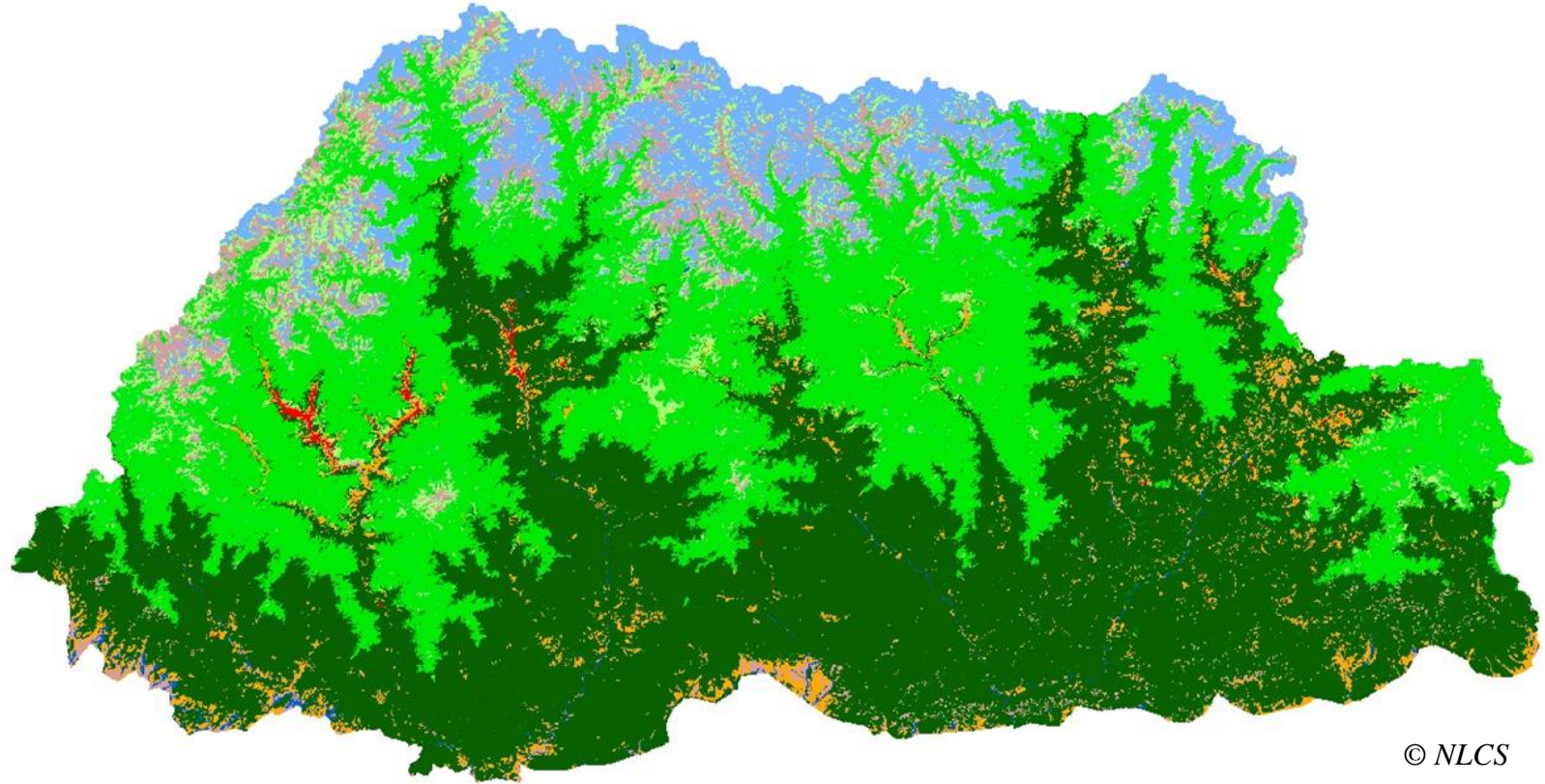


*GLOF stations in Punatsangchu Basin*

<sup>1</sup>GLOF EWS - Glacier Lake Outburst Flood Early Warning

# Space Application Currently used in Bhutan

- ❖ Management of natural resources
  - Free Satellite data for Mapping of Land, Forest, etc.
    - 71% of Bhutan covered with Forest
    - 43% under protected area



*Land cover map developed using Landsat data (30m)*



# Space Application Currently used in Bhutan

## ❖ Connectivity

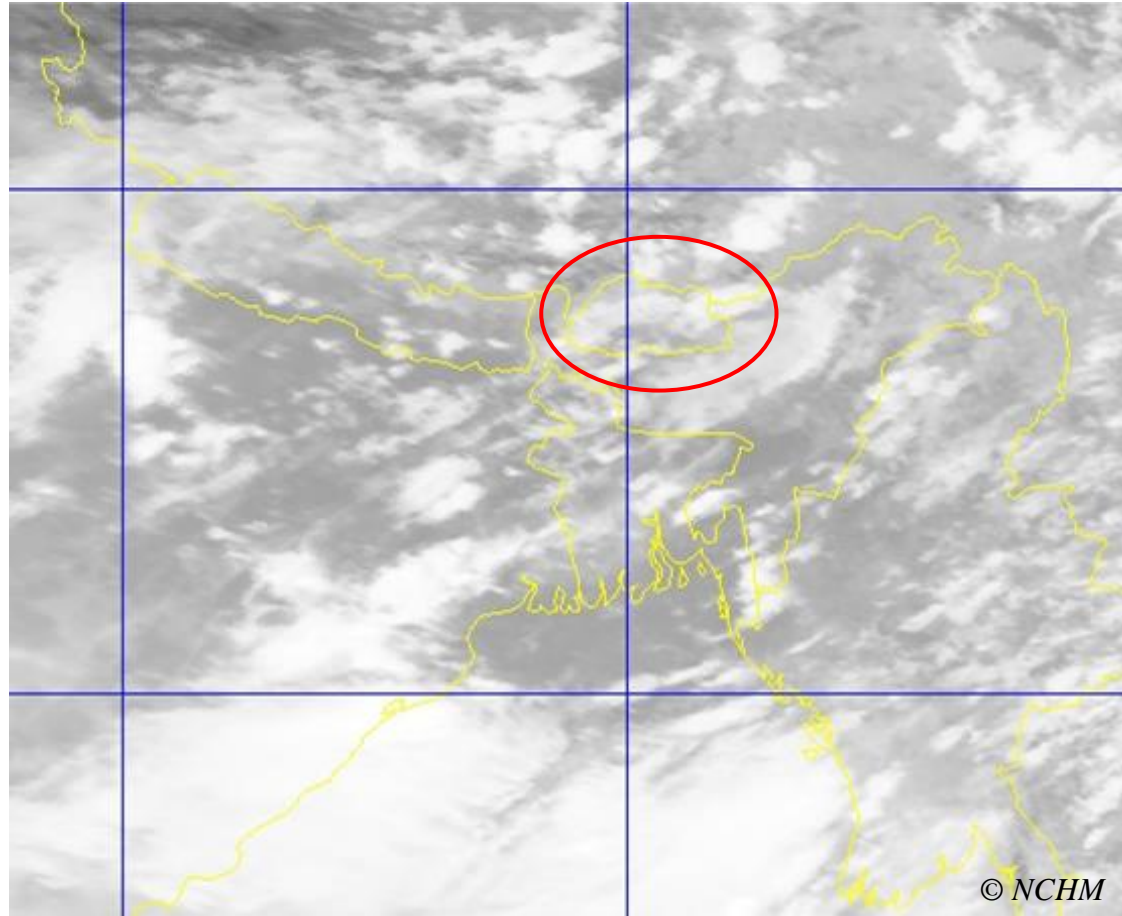
- Redundant link for telecom operators using VSAT and SAS transponder
  - 2 Operators
  - redundant link between 3 regions of the country
- Connectivity to Off-grid areas
  - 3 off-grid areas
  - basic internet connectivity - 512 Kbps
  - National TV(2) and Radio(4) channels





# Space Application Currently used in Bhutan

- ❖ Climate change
  - Weather forecast using data from Himawari satellite



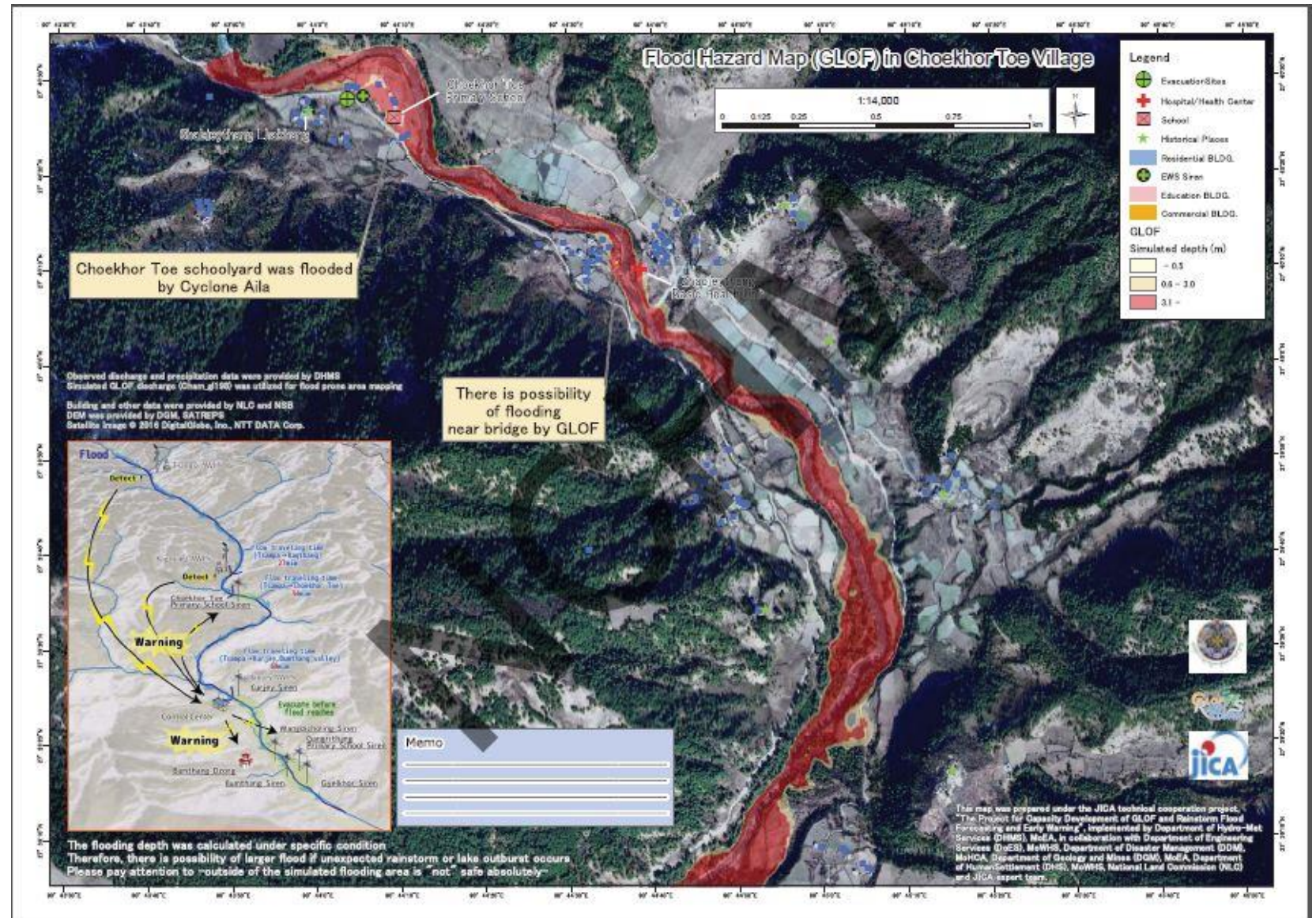
*Infrared image from Himawari Satellite*



# Possible use of Space Application in Bhutan

- ❖ Disaster risk reduction and resilience
  - Risk assessment for Landslides and Floods using satellite images

*Flood Hazard Map of Choekhor Toe Village*





# Possible use of Space Application in Bhutan

- ❖ Management of natural resources
  - Mapping mines, forests, surface water using satellite images
- ❖ Connectivity for the 2030 Agenda for Sustainable Development
  - Urban Planning using satellite images
- ❖ Social Development
  - Telemedicine services for off-grid areas and other remote locations
- ❖ Energy
  - Hydropower, solar and wind potential analysis using satellite images
- ❖ Climate change
  - Data collection from automatic weather station using satellite



# Challenges in Implementation of the Plan

- ❖ Lack of Capacity
  - Data processing and analyzing of satellite images/data
- ❖ Lack of Satellite Data
  - Resolution of Free Satellite images not good enough
- ❖ High cost
  - higher resolution data
  - Satellite communications services



# National Space Policy

- ❖ Currently in process of developing a Space Policy
  - Finalizing the Concept Note
- ❖ Parallely, internal Space Strategy document in being developed for national space program





# Priority Requirements

- ❖ TA on Policy development
- ❖ Capacity development on Remote sensing
- ❖ Satellite images from Advanced space faring nations



# Good practice in combating covid-19 and lessons learnt

- ❖ Quarantine every individual entering the country
- ❖ Vigorous Testing especially in high risk areas
- ❖ Use technologies
  - Use Contact Tracing App
  - Use Social Media to disseminate information to the public
  - Enable Work-from-Home Policy
  - Activate eLearning



# THANK YOU

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