Drafting Committee for the '*Asia-Pacific Plan of Action for Space Applications for Sustainable Development (2018-2030)*

'BHUTAN'

Bangkok, Thailand
31 May - 1 June 2018

First Satellite of Bhutan: Bhutan - 1

Bhutan - 1

- Developed as research work of our masters students at Kyutech as fulfillment of their degree.
- BIRDS-2 project Kyushu Institute of Technology.
- Scheduled to be launched to ISS on SpaceX rocket on June 28, 2018
- 1U CubeSat.
  - 10 cm x 10 cm x 10 cm
  - About 1.2 kg

Missions

- Camera Mission
- Magnetic Field Measurement
- Single Event Latchup (SEL)
- GPS Chip Technology Demonstration

Country Practices based on Priority Themes and Targeted Actions

For the Geo-Spatial analysis using GIS, Bhutan has the Bhutan GeoSpatial Portal (http://geo.gov.bt/) developed to conduct statistical analysis and other analytics.

Bhutan uses the following satellite applications with respect to Geo-Spatial uses:

1. **Bhutan Data Viewer** : An interactive web mapping application to view geospatial data arranged in various thematic areas.
2. **Bhutan Cadastral Mapping :** Web mapping application for locating land parcels in a given district on plot id information
3. **Glacier Dynamics in Bhutan Himalaya :** Interactive mapping of the glacier dynamics.

Country Practices based on Priority Themes and Targeted Actions

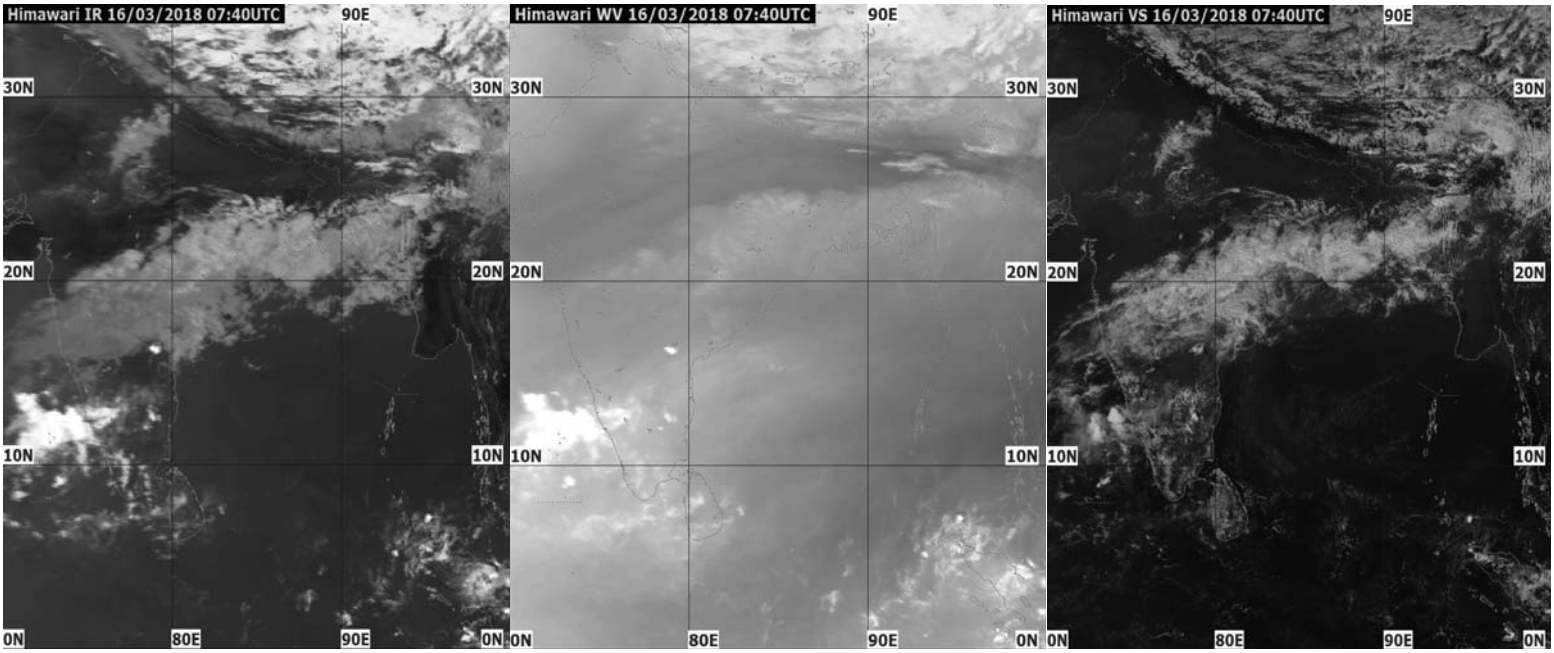
4. **Topographic Base map View.**
5. **Land Cover Dynamics in Bhutan.**
6. **Forest Fire Detection & Monitoring in Bhutan**

Utilization of Satellite in National Center for Hydrology & Meteorology

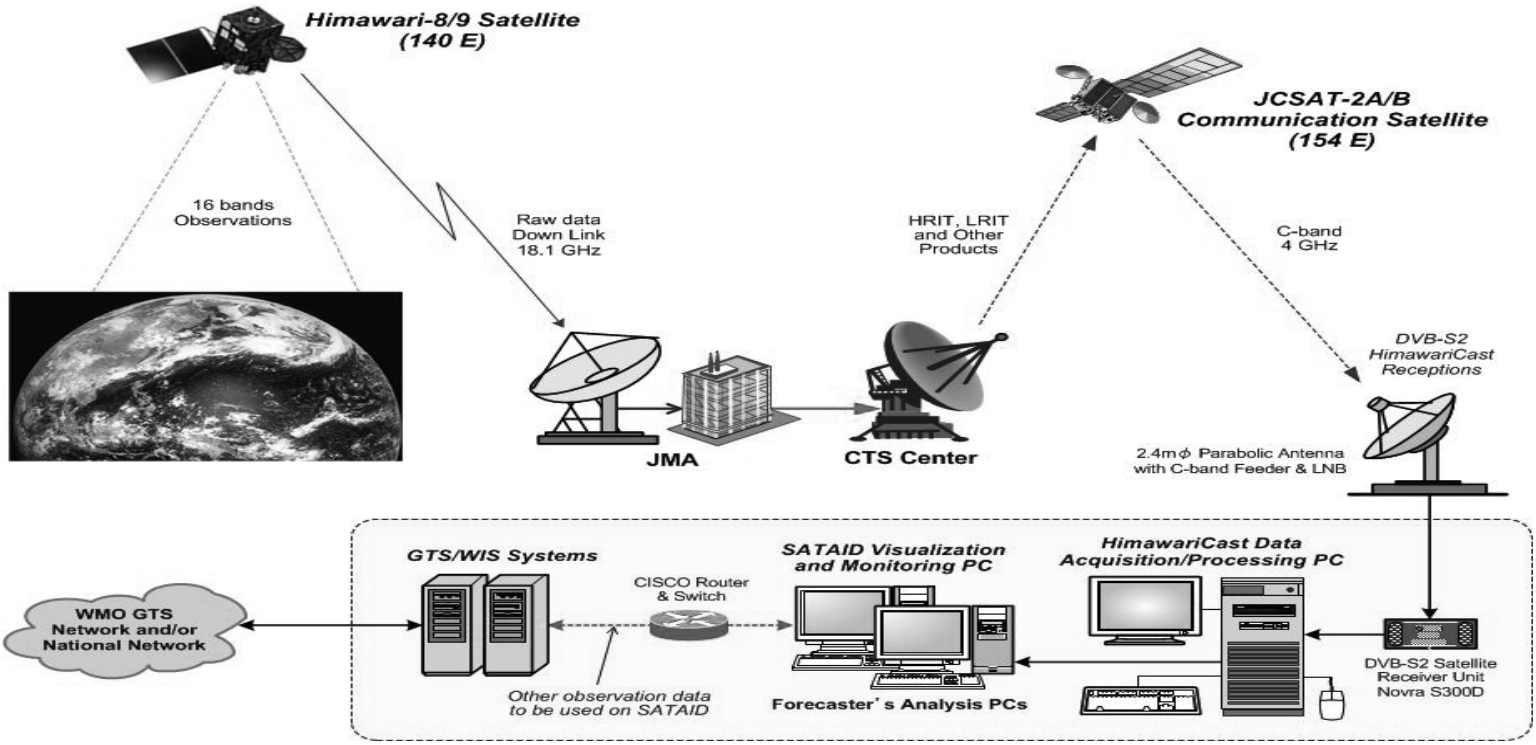
1. Weather Forecast

Himawari(“sunflower”)-8 in National Weather and Flood Warning center(NWFWC).

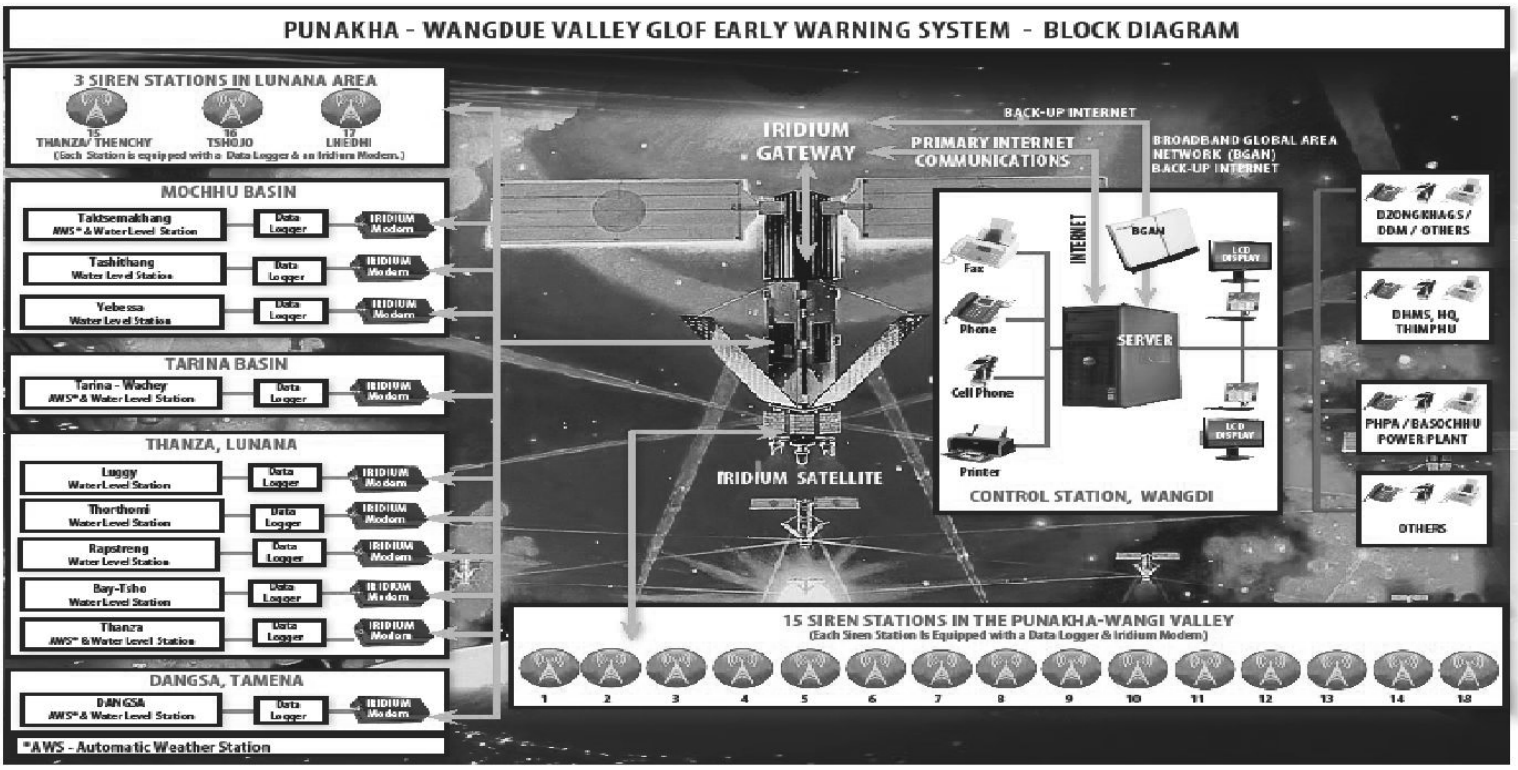
Examples of Infrared, Watervapor and Visible channel images.

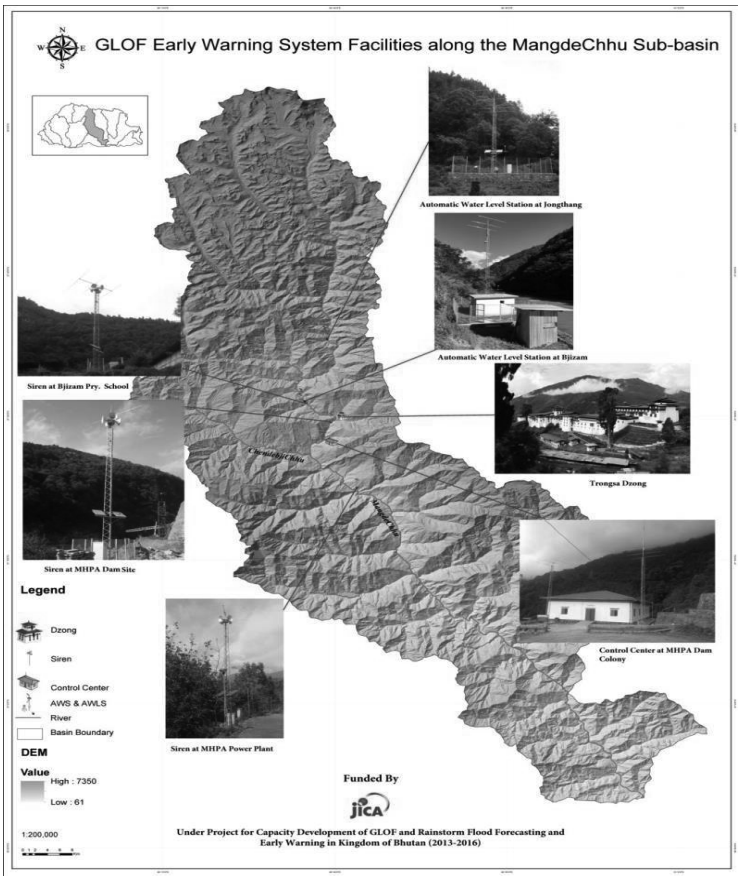


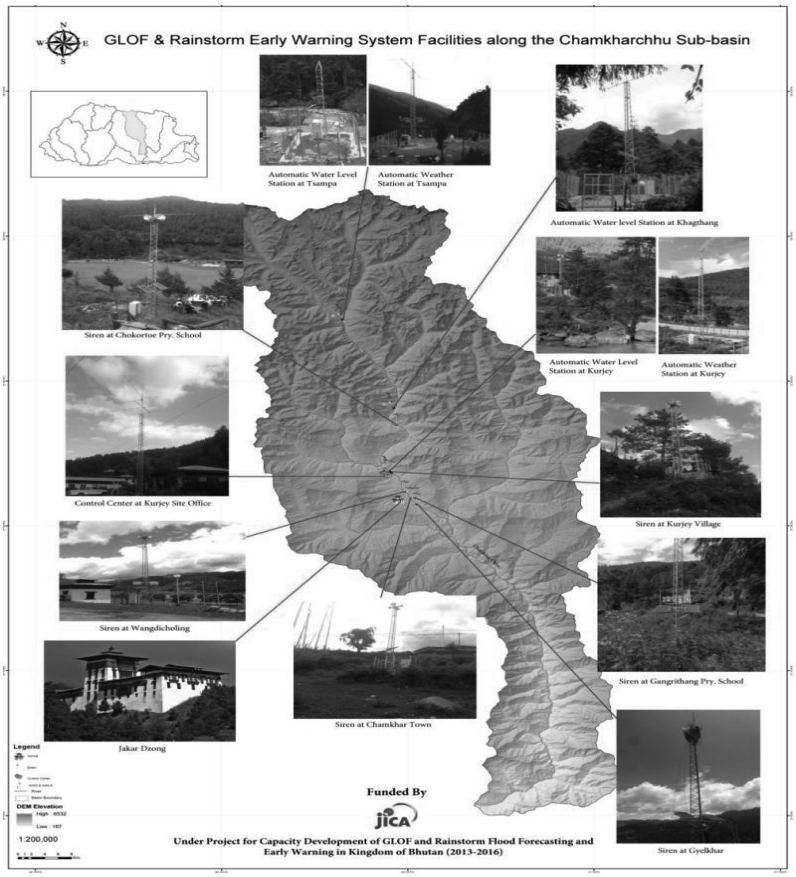
2. Data transfer

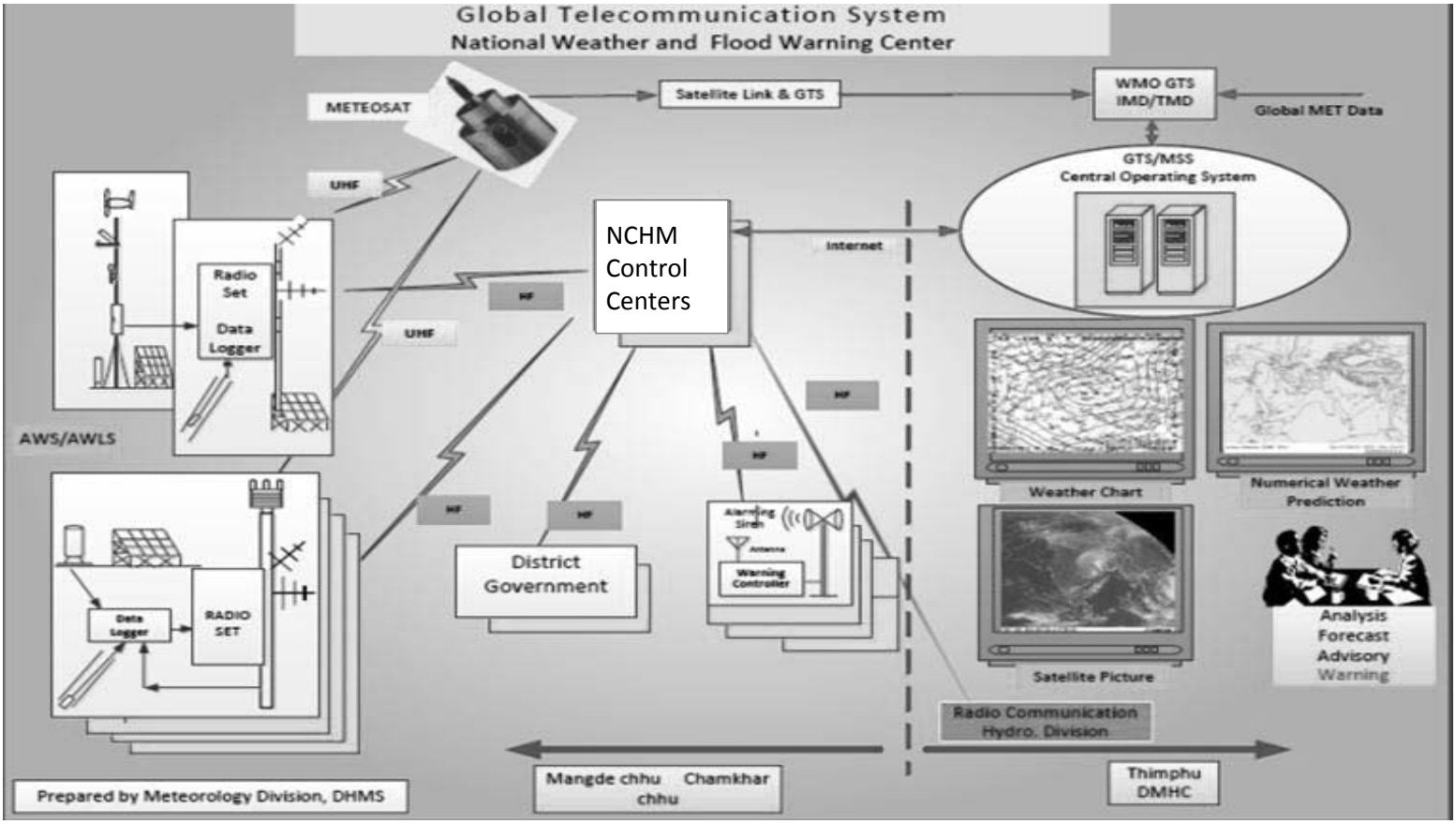


3. GLOF Early Warning System









Country Practices based on Priority Themes and Targeted Actions

- *Social development : Bhutan does not use any satellite applications in the Health and Education Sector. (do we have plans to use the applications in Health and Education sector?- what are the constraints?)*

Disaster Risk Reduction and Resilience: The Department of Disaster Management currently uses Satellite Phones at places where the terrestrial network is unavailable. They also use VHF analogue walkie talkies.

Reference document: Regional Road Map for Implementing the 2030 Agenda for Stainable Development in Asia and the Pacific

Country Practices based on Priority Themes and Targeted Actions

Climate Change : The National Center for Hydrology & Meteorology (NCHM) uses satellite for the following applications:

1. Remote Sensing for Data Collection and Data Transmission.
2. Use a global satellite i.e Himawari-8 Satellite in National Weather and Flood Warning Center.
3. Use of Meteosat - An European Union Satellite for the communication from the field to the head office.
4. They also use Iridium Satellite for the communication and data collection.

Country Practices based on Priority Themes and Targeted Actions

Energy: The Department of Renewable Energy gets the local data from NCHM and the global data from National Renewable Energy Laboratory (NREL) who gets the data from satellite.

They use these datas for analysis and feasibility studies.

Country Practices based on Priority Themes and Targeted Actions

Management of Natural Resources : The Forest Resources & Management Division, Ministry of Agriculture & Forest uses Geographic Information System (GIS) to design, plan, analyze, manage and present spatial and geographic data.

Country Practices based on Priority Themes and Targeted Actions

Connectivity : The Department IT and Telecom, Ministry of Information & Communications will use South Asia Satellite (SAS)/ GSAT-9 to receive the two national tv channels at the remote places of the country.

They will also use the SAS to provide the internet to the places devoid of terrestrial services.

(Acknowledge India's support in space technology. SAS- what are the other benefits we could avail from SAS besides internet and BBS)

Country Needs based on Priority Themes and Targeted Actions

- **<u>Research and knowledge sharing:</u>**
  - To promote the use of space applications, we need basic satellite background training. We should also know the various satellite applications that can be used in different agencies for various purposes.

(support of ISRO in capacity building- we could mention the areas where ISRO support is not available)

- **<u>Capacity building and technical support:</u>**
  - Training on operation of ground station, frequency coordination & spectrum management.

Country Challenges

- Lack of competency & capacity.
- Limited/lack of fundings.
- Dependency on stakeholders.


Himawari VS 09/06/2016 22:06UTC
Thank you for
your kind attention