Kingdom of Bhutan

1

Session 3.3

Country report

Bhutan

Phuntsho NAMGYAL

National Center for Hydrology and Meteorology

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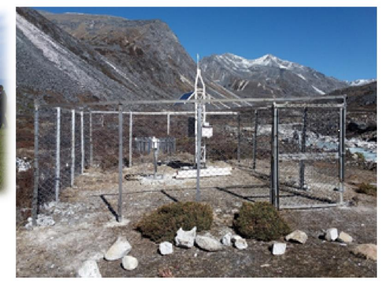
1. Observation system overview

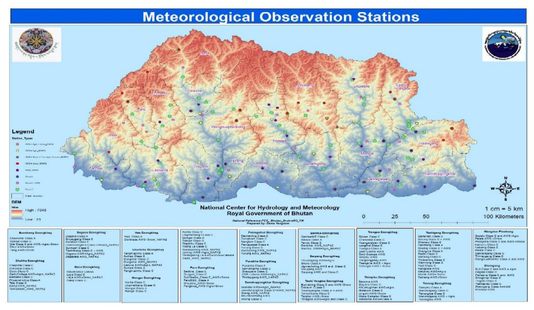
Surface Observation
Manual Met Station – 78
Automatic Weather Station - 80
Cyrosphere Observation –
Hydrological Network – 84
GLOF/Flood Early Warning System – 3 valleys



Upper air Observation
Wind Profiler – 1

Observation for civil aviation
AOWS –

Weather Radar Observation – *None*
Geostationary Satellite Observation – None



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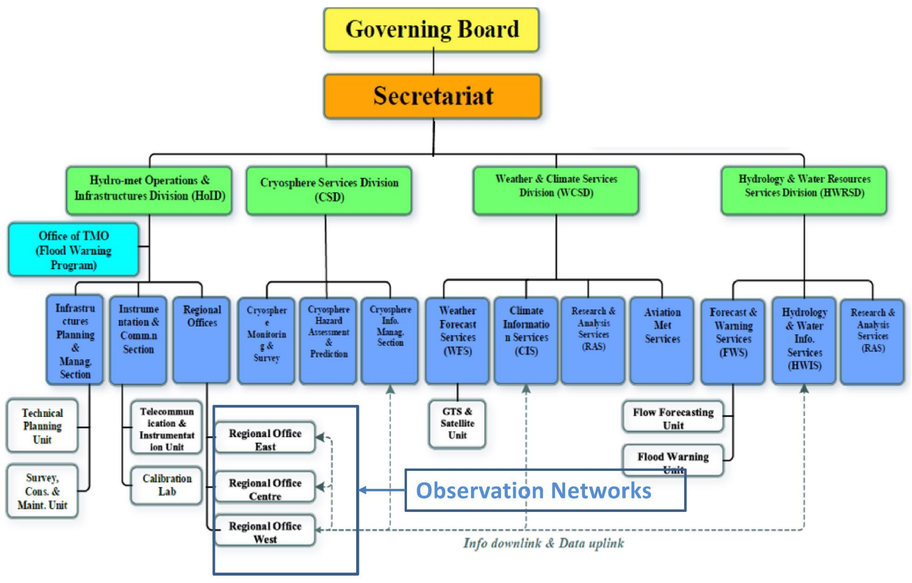
2. Observational organization structure



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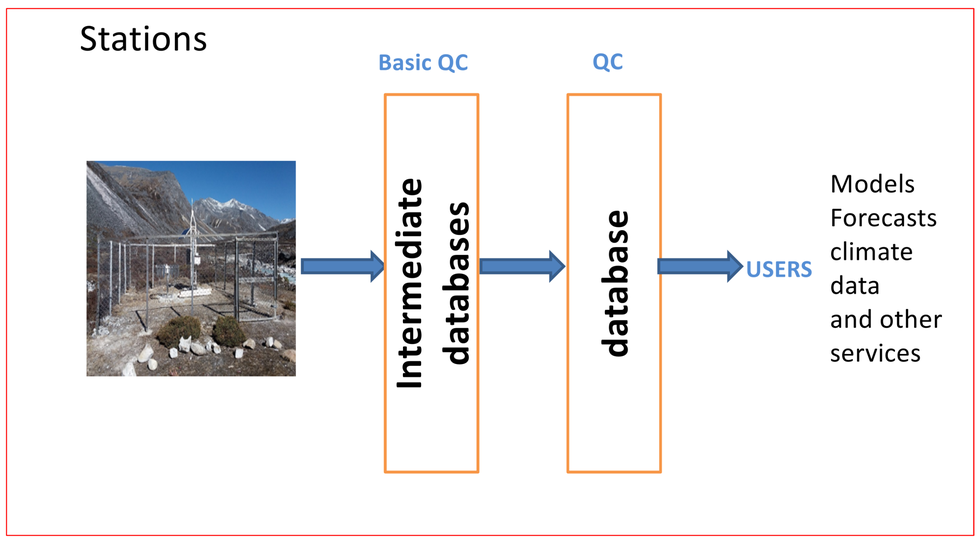
3. Quality management of observation data



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4. Integrated use of observation data

- We are planning to install weather radar
- Planning to use rainfall data with soil data to give information on landslides
- Currently we use data from manual and automatic weather stations only integration
- Rainfall data with water level information to come out with inundation mapping

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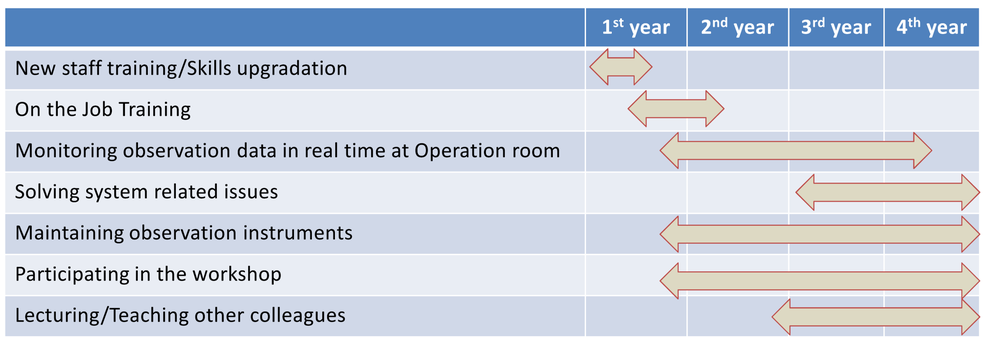
5. Observer/expert training timeline



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6. Plan for developing products

FY	2018	2019	2020	2021	2022	2023-2027
	Phase - 1		Phase - 2			Phase - 3
Provision of materials and trainings for users	• Learn more about WIGOS and related activities • Attend workshops and trainings provided by WIGOS circle • Learn about product specification / observational network requirements etc from WRCs • Make plans to have better linkages /collaboration with other RA-II members and WRC		• Engage in collaborative works with other members • Plans to standardize products • Provide information and services to user			• Engage in information dissemination and services provision
Forecasting and provision of services to disaster risk reduction	• Improve observational data quality • Have good QC controls in Place • Learn from WIGOS network about QCs/ observational techniques / product generation etc		• Issue better quality forecasts • Provide longer range forecasts and outlooks • Develop flood hazard maps • Develop landslide maps			• Develop flash flood guidance • Provide more accurate 7 days forecasts • More flood hazard maps

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7. Expectation for this workshop

- To have common and proper understanding about WIGOS and its activities
- Learn from WRCs regarding the services that can be availed by the members
- Learn key issues on WDQMS, OCAR and other related forums of WMO
- To source material and knowledge for lecturing to technicians, engineers in my office
- Making meaningful and firm relationships between participants to exchange useful information after the workshop