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VIET NAM

## Status of quality management in rainfall observation

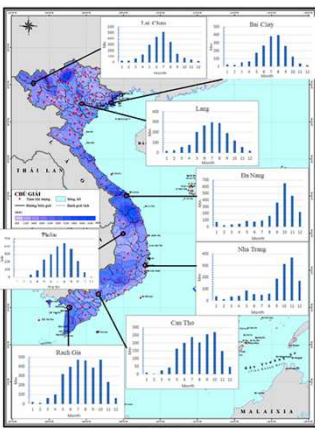
Le Xuan Duc

Do Thi Tam Khanh

Country report in RAIL WIGOS workshop on quality management of observation held in Tokyo, March 2018

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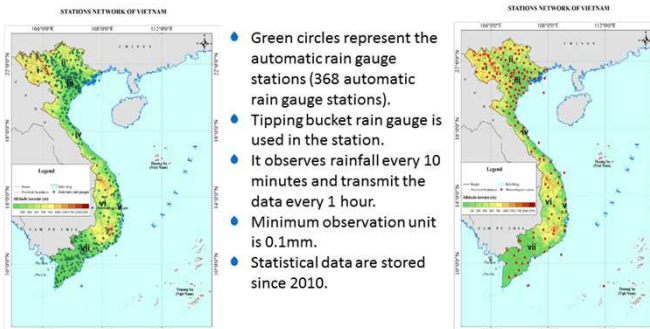
## 2. Annual rainfall map



Rainfall amount annual average from 1985 to 2017 in Viet Nam: 1897.1mm.  
The North of Viet Nam: 1798.8mm.  
The Middle of Viet Nam: 2118.7mm  
The South of Viet Nam: 1875.1mm

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#### 4. Rain gauge network



- Red circles represent the manned rain gauge stations ( 370 the manned rain gauge stations)
- Observers read the rainfall value every 12 hour and report the data once a day.
- Minimum observation unit is 0.5mm.
- Statistical data are stored since October 1990.

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## 6. Quality management

With automatic rain gauge stations:

- Equipment is calibrated every year (must be before rainy season)
- Rain gauge inspection twice a year
- The observation data transfer to the operation central to check the accuracy. If any error appear, we'll plan to fix this.
- Training course for the observer and the technical staff once a year

With manned rain gauge stations:

- Daily check by the observer.
- Equipment is calibrated every year (must be before rainy season).

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## 1. Challenges in rainfall observation

- Lack of the skilled experts for the maintenance to keep the accuracy of rainfall observation
- High mountainous terrain is very difficult to install, maintenance, communication infrastructure in these areas has not been developed.
- The rainfall distribution has seasonal variation and different between each regions of the country. It's very difficult to select measuring equipment (For example, in the North of Vietnam, summer is the rainy season with the of rainfall is high and strong intensity, but winter the amount of rainfall is very small - drizzle).
- Automatic rain gauge network is low density (368 stations), real time data transmission.
- Lack of annual budget for new station installation and maintenance.

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### 3. Major recent rainfall-related disaster

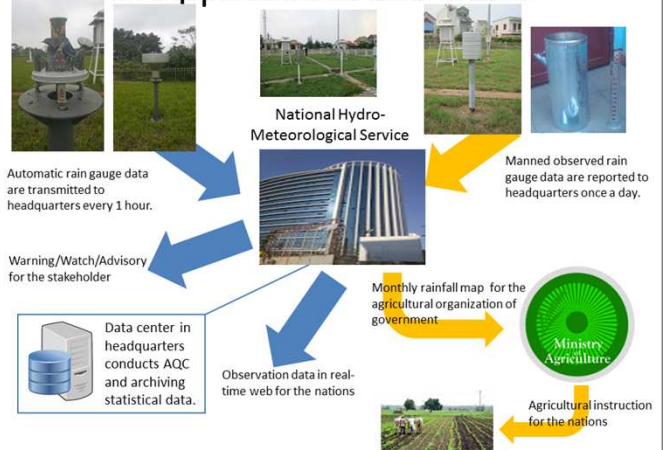
## Heavy rain in Quang Ninh 2015

- From 2015Jul25 to 2015Aug3
- Heavy rains and subsequent floods
- Northeast of Viet Nam (Quang Ninh province)
- Max over 400mm rainfall in 24hour, total amount over 1600mm in 10days
- 17 people killed, over 3700 houses destroyed, 4.000 hectares of rice and other crops, 1.200 hectares of aquaculture destroyed ...



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## 5. Applications and users



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## 7. Expectation for this workshop

- Knowing how to adopt quality management
- Getting some skills of quality control for observation data
- Getting some materials for lecturing about quality management in my office
- Making firm relationships between participants to exchange useful information after the workshop.

