Meeting report

Red River Delta: issues and initiatives

August 1, 2017

Colophon

Delta Alliance Wing — Vietnam Red River

Publication date — August 10, 2017
Address — Hanoi, Vietnam

Contents

1. General information

On August 1, 2017, the Red River Delta Wing organised a meeting to discuss about issues causing decrease of water level in the Red River and measures that can be likely applied to solve the problem.

Subject of the Meeting: Red River Delta: issues and initiatives

Objective of the Meeting:
- Comprehensively review the issues causing the decrease of water level in the Red River;
- Assess possibility of combining remote sensing and citizen science in solving the problem.

Venue of the Meeting: the Hanoi University of Natural Resources and Environment (HUNRE)

Participants:
- Assoc. Prof. Pham Quy NHAN (HUNRE)
- Dr. Hoang Thi Nguyet MINH (HUNRE)
- Thi Van Le KHOA (HUNRE)
- Assoc. Prof. Bui Nam SACH (IWRP[1])
- Dr. Ha Thanh LAN (IWRP)
- Dr. Dao Trong TU (CEWAREC[2])
- Lecturers and students of Faculty of Water Resources, HUNRE

The meeting included presentations from Assoc. Prof. Nhan, Assoc. Prof. Sach, Dr. Tu and Mr. Khoa. After the introduction of Assoc. Prof. Nhan about the Wing and future plans, Dr. Tu provided information regarding operation of hydropower dams in the upstream area and impacts to downstream. He highlighted the decrease of the river bed due to sediment blocked in the upstream reservoirs, and bed erosion caused by hungry water (water with sediment load smaller than equilibrium). Assoc. Prof. Sach presented the state of irrigation works in the area and proposed measures to ensure the water security in the area. Finally, Mr. Khoa concluded the meeting with his research proposal of combining remote sensing and citizen in monitoring activities in the Red River delta.

2. Issue and initiative

The Red River is an importance water source of many socio-economic activities in the delta. Recently, due to the decrease of water level in the river, pumping stations installed along the river have failed to extract and deliver water to irrigation areas. This state has caused adverse impacts to environment and likelihood of local people.

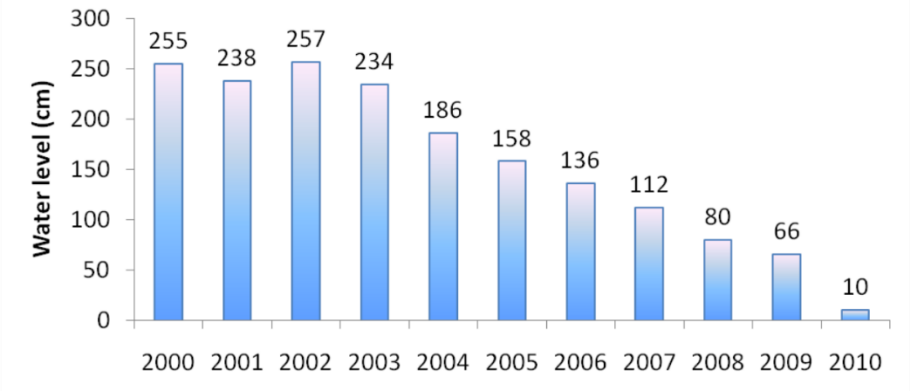

Fig1. *The decline of minimum water level of the Red River at Hanoi station (the station is located in the Red River, this figure is cited from the presentation of Dr. Tu)*

[1] Institute of Water Resources Planning

[2] Center for Sustainable Development of Water Resources and Adaptation to Climate Change

In the last 10 years, water level in the Red River downstream has decreased substantially. The water level of the Red River from December to May has been lower than the average of previous years of about 0.5 to 1.1 meter.

According to Assoc. Prof. Sach and Dr. Tu, the main reason for the drop of the water level in the river is the decrease of river bed. The meeting has specified 2 main issues causing the problem:

(1) Unbalance of sediment in the river: The amount of sediment transferred from upstream was reduced due to reservoirs' storage in the upper area, while the amount of sand exploited downstream is increasing due to pressure on infrastructure in the Red River Delta;

(2) Long regulation of reservoirs: Upstream reservoirs in land of both Vietnam and China, retained a certain amount of water during the flood season and the dry season has altered the downstream flow regime.

Regarding these issues, continuous monitoring of sediment concentration in the river is highlighted for quickly detecting the change and predicting the trend is strongly necessary. In addition to conventional methods for gauging suspended sediment concentration, remote sensing technique is considered to become very potential with support of citizen.

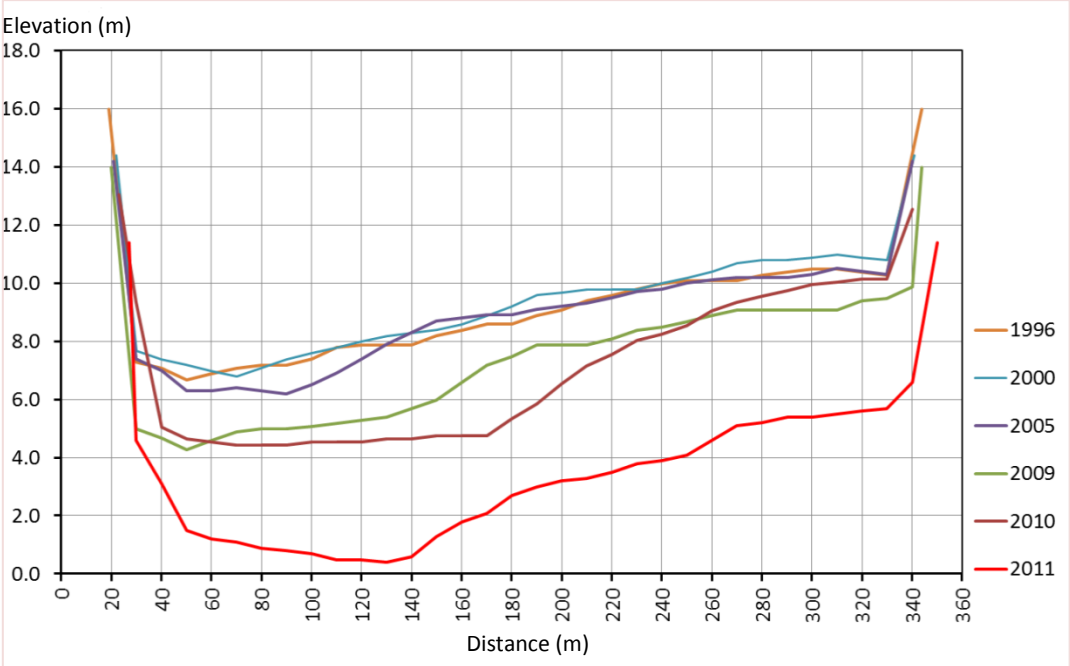

Fig.2: *Changes of cross-section at the Vu Quang hydrological station (the station is located in the Red River, this figure is cited from the presentation of Assoc. Prof. Sach)*

Some applications of remote sensing were introduced in the meeting, including studies of land-cover change, coast/river-line change detection, water quality monitoring (comprising suspended sediment concentration). The meeting has discussed many relevant issues:

(1) Free remote sensing data sources;
(2) Method bringing and maintaining citizen to science studies;
(3) Reliability of data monitored by remote sensing and citizen;
(4) Storage and sharing of data.

3. Conclusions of the meeting

The meeting has been successfully organised with some important remarks:

- The decrease of water level in the Red River delta is mainly caused by shortage of suspended sediment in the water body. This issue is the consequence of long-time regulations of upstream reservoirs located in land of China and Vietnam;
- Combing remote sensing and citizen science (e.g. monitoring by students or other volunteers) is possible and should be implemented in the Red River delta to continuously monitor the suspended sediment concentration. The understanding of suspended sediment concentration in the river is significantly important to figure out the physical relation between suspended sediment and water level;
- Citizen Science has large potential in scientific activities. Many previous researches have proved the success of bringing local people into monitoring natural resources. In the Red River delta, less complex projects should be prioritised to be first implemented to investigate the responsiveness of citizen;
- Within the implementation of the project, an open platform should be built to easily store and share the data.

Some photo's: