The 2nd Symposium on JASTIP Disaster Prevention International Cooperation Research (JASTIP-WP4 Symposium)

Collaborative TLU&DPRI Research to support dam safety in Vietnam

Pham Hong Nga
Thuyloi University, Vietnam

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Outline

- Overview of dam development in Vietnam
- Relate sedimentation problems
- Collaborative research TLU & DPRI

Overview of dam development in Vietnam

Vietnam is located in South - East Asia

- Territory : 331,000 km2 (75%mountainous)
- Subtropical humid monsoon climate
- Population: 90 mil.
- Mean annual rainfall 2,000 mm
  - ➢ 75% in only three months
  - ➢ more than 30% in one peak month
- Total mean annual runoff 880 bil. m^3
  - ➢ ranking 12th in the world
  - ➢ 70% is from outside the border

Overview of dam development in Vietnam

Wet season

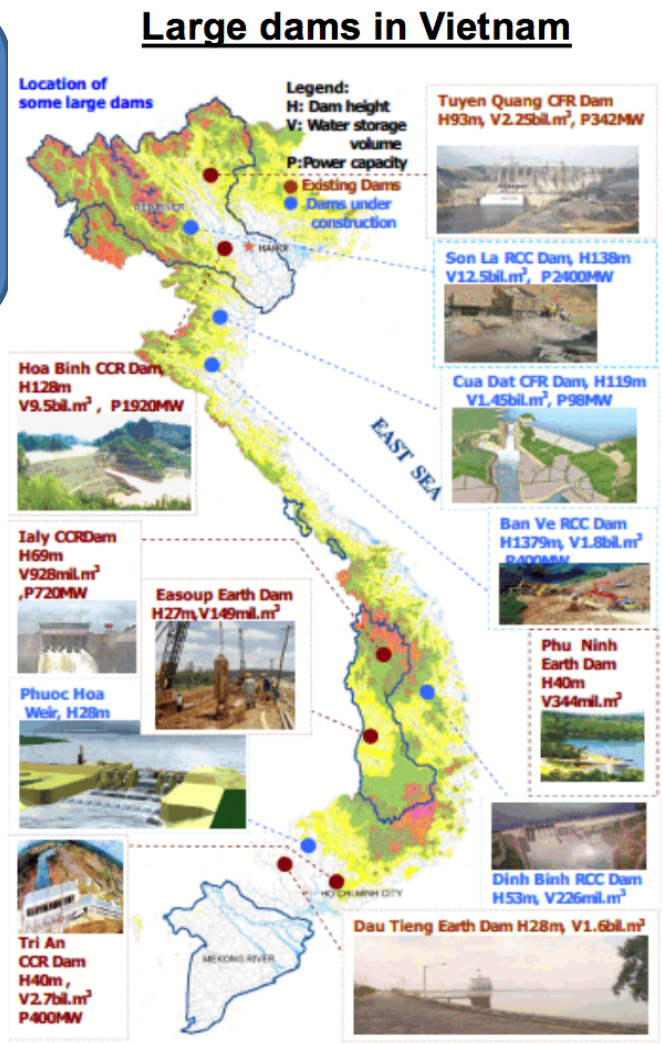
- *rapid flood concentrations*
- *heavy inundation in alluvial plains and deltas involving big cities.*

Dry season

- *water shortages (the minimum flow ~ 1% of annual average)*
- *serious drought*

Flow regulation for agriculture and water supply

Intensive dam development
~**7,000** dams
(~80 large dams)



Sedimentation related problems in Vietnam

DAM

- Outdated design and maintenance
- Lack of regulation on sedimentation discharge; lack of data
- Reservoir filling up to reduce capacity for flood storage and affect dam safety

Sediment transport

- Rivers with high turbidity or high carrying capacity
- "Hungry" river causing serious erosion in downstream
- "Clear" water negatively affecting soil fertility and aquatic ecosystem

Sedimentation related problems in Vietnam

Vietnam UNESCO heritage threatened by erosion as dams stop sedimentation | Society | Thanh Nien Daily

thanhniennews.com/society/vietnam-unesco-heritage-threatened-by-erosion-as-dams-stop-sedimentation-46400.html

An eroded section at the Cua Dai Beach in Hoi An. Photo: Hoang Son

Hydropower dams on the Vu Gia – Thu Bon River system has hindered s
downstream, causing severe erosion that could wipe out a popular beach
experts warn.

"Climate change with a sea-level rise of 30cm is not the only reason for th
of erosion of Cua Dai Beach," Vu Thanh Ca of the Scientific Research Ins
Islands said.

"The major cause is a significant change in sedimentation in the Vu Gia -
system that flows into the East Sea near Cua Dai," Tuoi Tre (Youth) news
him as saying.

Safari

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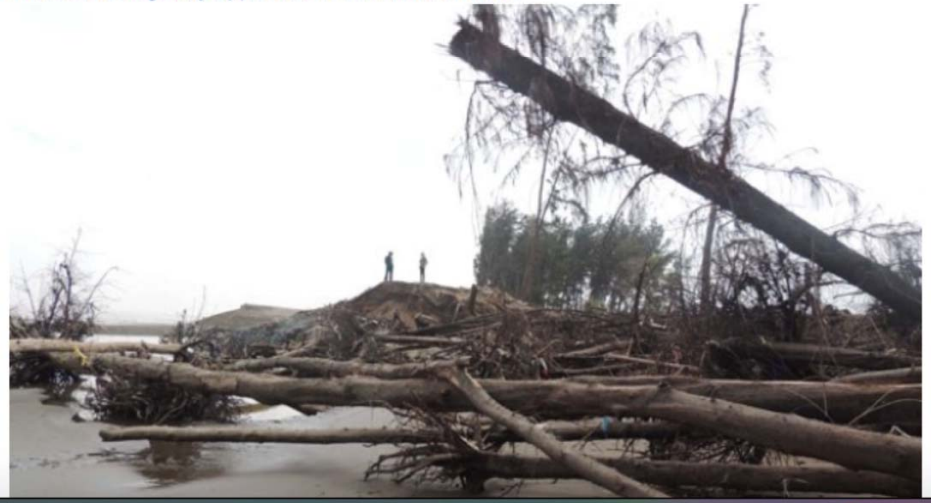
Mekong Delta Loses Half of Silt to Upstream Dams: Scientists | Thanh Nien News

Date: Monday, May 2, 2016

This article originally appeared in *Thanh Nien News*.



Collaborative research TLU&DPRI

- Title: “**Integrated study on sedimentation problems for sustainable reservoir management in Vietnam**”

- **Duration: April 2017 – April 2019**

Collaborative research TLU&DPRI

- **Research objectives**:

✓ To investigate & analyze, evaluate the current situation of sedimentation in the reservoirs in Vietnam;

✓ To develop an indicator for reservoir classification based on sedimentation rate and reservoir longevity;

✓ To propose technical solutions for removing accumulated sediment in reservoirs;

✓ To develop an annual updated accumulated sediment database used for future reservoir sedimentation management in Vietnam.

Collaborative research TLU&DPRI

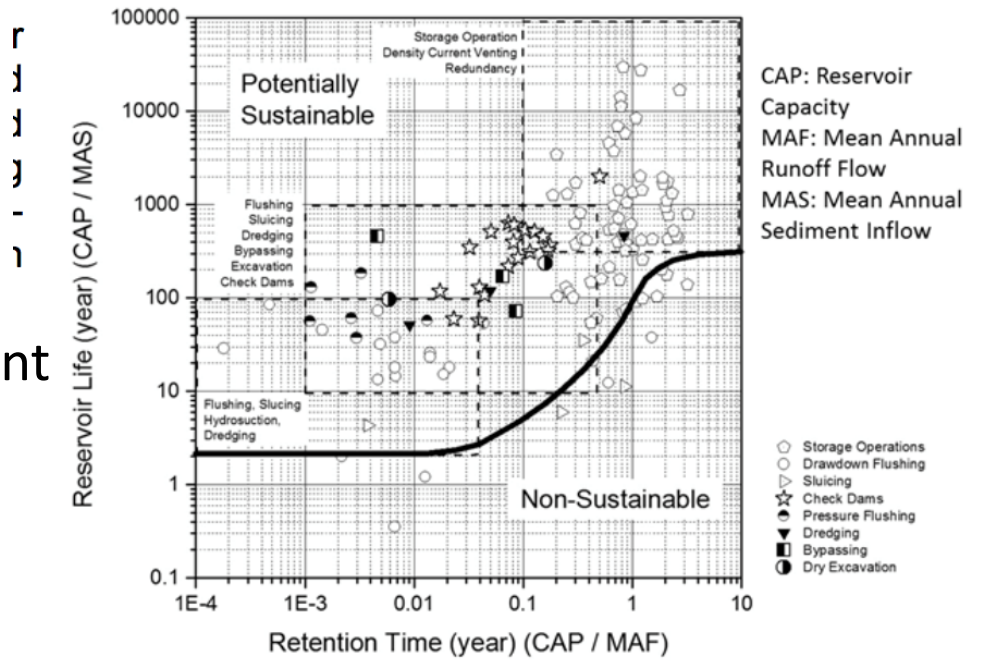
Methodology and approach:

- Literature reviews and available data collection;
- Field survey upstream, inside, and downstream of the selected reservoirs;
- Remote sensing and GIS analysis to investigate the sources and the factors controlling the sediment yield into the reservoirs

- Integrated approach evaluation to catchment management that will reduce eroded soil surface and sediment accumulation in the reservoir;

- SWAT modeling to calculate sediment dry bulk density, trap efficiency, sediment yield and deposition position.

ICOLD Diagram for reservoir sedimentation management



Collaborative research TLU&DPRI

- **Expected outcomes and significance:**

✓ A framework of database will be developed

✓ Based on the findings about technical/social problems of sedimentation in the reservoirs in Vietnam and lessons learned from Japan, the project will propose future in-depth researches to investigate relevant measures to effective sedimentation management toward sustainable dam development.

✓ The collaboration between DPRI and TLU will be further enhanced.


Thank you