

## Questions and Answers in the PIANC Asian Seminar 2023 (Webinar)

### Questions to Dr. Yasuyuki Nakagawa

#### Question 1

I would like to know which instrument you use to measure bulk density.

#### Answer 1

For the density measurements, we have used an in-situ device based on the tuning fork principle, the Mud Bug, which is the product of Hydramotion CO.

#### Question 2

While it may be challenging task, is there any effective solution to prevent siltation of navigation channel by investigation of spatial distribution and sedimentation depth of the fluid mud?

#### Answer 2

Getting the information on the spatial distribution of soft muddy bed including the bulk density, you could select and design more effectively any counter measures to find out the better place, for example, to locate the submerged dike.

#### Question 3

About water injection dredging, could it be carried out by using any dredger (by attaching an equipment) or there is special dredger for this purpose?

#### Answer 3

For the water injection dredging, you need special vessel equipped with the pumping system.

#### Question 4

Do you have any idea to move or shift the sediment settlement area from one place to another?

#### Answer 4

Control of the current field with any dike or other structure could be a potential countermeasure for move or shift the sediment on order for the sediments not to settle inside the navigation channels. Another concept is, if soft muddy environment, that you can make the sediments fluidized by using any device like the water injection and the sediments may transport as density flow into deeper site out of channel.

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### Questions to Dr. Aloysius Bagyo Widagdo

#### Question 1

For Asahan river (case 1), at the first bend, was further analysis done on the flow velocity before and after implementation?

#### Answer 1

Unfortunately, flow velocity analysis was only carried out before the proposed dredging implementation. Therefore, the flow velocity at the bend after implementation is not available. But I think it can be estimated by comparing the wet area of the channel cross-section between them.

#### Question 2

For Asahan river (case 1), would it be harder for vessels to navigate the smoother bend due to the higher flow velocity?

#### Answer 2

In general, the higher the speed of the current, the more difficult it is for the vessel to navigate. As long as the increase in current speed is still within the current tolerance limits, the vessel can navigate properly. However, the smoother bend is better than the first bend, because it is easier to maneuver the vessel.

#### Question 3

For Jelitik river mouth (case 2), I am wondering if you or your government has already worked to evaluate the benefit of the construction of the jetty. Was it financially feasible? If you haven't done the evaluation yet, do you have a plan to do the evaluation in the future?

#### Answer 3

At this stage, a financial feasibility assessment has not been carried out. Recommendations from research have been proposed, and only from an engineering point of view. Feasibility study is required when study results are to be followed up.

#### Question 4

Would like to know what are the main driven forces in affecting the sedimentation/erosion for access channel of Jelitik river? Is the modelling conducted for morphological changes has coupled both wind-generated waves and tidal currents during the course of simulation?

#### Answer 4

The main driven forces that create the sedimentation of the Jelitik river access channel are waves and currents. However, lead mining activities in sea waters must be considered because they can change the bathymetry and bed sediment conditions. In the simulation with MIKE21 using the sand transport module, coupled forces of waves as well as hydrodynamics are included.

#### Question 5

Do you have any idea to move or shift the sediment settlement area from one place to another?

#### Answer 5

The most common way to move sediment deposits from one side of the access channel to the other side is sand bypassing. However, for more specific cases of sediment transfer from one place to another, further studies need to be carried out.

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## Questions to Dr. Nguyen Viet Thanh

Question 1

Do you have an equipment to minimize siltation?

Answer 1

To minimize the siltation, the MOT invested in constructing two jetties-protected Duyen Hai harbor basins in 2017. However, due to the fluid mud in the siltation is still a problem in the navigation channel.

Question 2

How is the long-term trend of the sediment discharge, relating to the fact of dam construction as you explained?

Answer 2

As you know, many dams are in the upper part of the Mekong River basin, and the dam operation controls the discharges. Therefore, it is very difficult to find the trend of the sediment discharge. I found on the internet that Cambodia will be invested in a new dredging channel connecting the main Mekong River to the Thai Lan Bay. If this project comes true, the sediment discharges from the upper part of Mekong River will significantly reduce.

Question 3

What are the main external forces of sediment transport in the target area? Do you have seasonal variability?

Answer 3

Previous studies indicated that the back siltation in the navigation channel at Dinh An estuary is due to the low current velocity of the secondary ocean circulation, which often occurs in the curvature segments of the channel. Suspended sediment also settles in the channel due to decreased current velocity and sediment transport capacity when flow passes through the channel. The changes in hydrodynamic conditions are responsible for the most severe siltation in the curvature segments of the navigation channel.

Question 4

Bassac River and Quan Chanh Bo Channel can be used to reduce the congestion of Cho Gao canal. What are obstacles to the use of the Bassac River?

Answer 4

The channel to the Bassac River plays an important part in developing the Mekong River Delta. If the channel depth is deep enough, the larger vessel can be entrancing the Can Tho port, reducing the congestion of the Cho Gao canal.

The main obstacles are as follows:

- The channel in Dinh An estuary is unstable, with mobility and high back siltation due to the dynamic of the offshore crescent bars.
- Fluid mud appeared in the new navigation channel to the Quan Chanh Bo channel.
- No congestion is channel segment in the Duyen Hai harbor basin and Dai An mouth with high siltation from 2017.

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### Questions to Dr. Nguyen Viet Thanh

#### Question 5

I have heard that the Vietnam government has dredged the Quan Chanh Bo channel connecting Bassac River to the sea. Could you tell me the draft of the Quan Chanh Bo channel.

#### Answer 5

The new navigation channel for heavy tonnage vessels to the Hau River (Bassac River) has a dredging level is -6.5 m (Chart Datum), and the channel width ranges from 85 to 95m, allowing the vessel 10,000 DWT (full load) and 20,000 DWT (half load) enter the Can Tho Port.

#### Question 6

Do you have any idea to move or shift the sedimentation area from one place to another?

#### Answer 6

The existing jetties effectively reduce sedimentation in the navigation channel to Bassac River and Duyen Hai Port. The main reason is that fluid mud appeared in this area. Most of the countermeasures to control the fluid mud are still not effective. I think dredging some large deep holes near the navigation channel to trap the fluid mud may be a significant method.

On the other hand, our country calls the investors from abroad to invest in building the Tran De port in Soc Trang province. The Tran De port is located offshore with water depth about 15-20 m, and it is far from the coast of Soc Trang province, about 20 km. Tran De Port is to develop into a special deep-water seaport as a gateway of the Mekong River Delta. The seaport will be capable of berthing vessels with a capacity of between 100,000 and 160,000 DWT.