



Living Polders: Dynamic Polder Management for Sustainable Livelihoods, Applied to Bangladesh

Field Visit to Beel Pakhimara and Laboratory Analysis: Water Sample Collection, Soil and Water Sample Analysis (Seventh Field Visit)

Conducted during: 7 to 18 April, 2018



**Institute of Water and Flood management (IWFM)
Bangladesh University of Engineering and Technology (BUET)**

General Information

Project Name: Living Polders: Dynamic Polder Management for Sustainable Livelihoods, Applied to Bangladesh

Date of Visit: 7 to 18 April, 2018

Visited Places

- Khulna University Laboratory (7 to 10 April)
- Tala Upazila in Shatkhira (7 April)
- Kobadak River, Neap Tide Sampling, Shatkhira (8 April)
- Kobadak River, Spring Tide Sampling, Shatkhira (17 April)
- Khulna University (18 April)

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Introduction

For monitoring the sediment load in the Kobadak River over the year in different seasons, this field was organized to collect pre-monsoon season water samples.

This field visit was aimed

- (i) to collect water samples during spring and neap tide from Kobadak River and inside the Pakhimara Beel and
- (ii) to do laboratory analysis of the collected soil and water sample in Khulna University.

Description

Water Sample Collection and Land Level Change Monitoring inside Beel: After the reconnaissance survey and equipment setup in beel and river on 7 April, on the next day we have collected water samples in Kobadak River at one point and six points inside the beel.

Neap and Spring tide samples were collected on 8 April and 17 April, respectively, for 15 hours in each tidal cycle at one hour interval from 8.00 AM to 10.00 PM. To find out the vertical distribution of the sediment along in the river samples were collected at varied depth, 0.2, 0.6 and 0.8 of water height from water surface. In the beel, to get the sediment load distribution in different canal, samples were collected at 0.6 of water depth from the surface. Sampling location for spring is 22.667825, 89.261784 and for neap is 22.667911, 89.261521 in the Kobadak river.

Six points inside beel are-

- | | | |
|-------------------------|-------------------------|-------------------------|
| A) 22.672363, 89.253537 | B) 22.671679, 89.253449 | C) 22.671158, 89.254485 |
| D) 22.668870, 89.253830 | E) 22.672346, 89.249669 | F) 22.676808, 89.247870 |

In both cycles, we have collected 268 water samples in total.

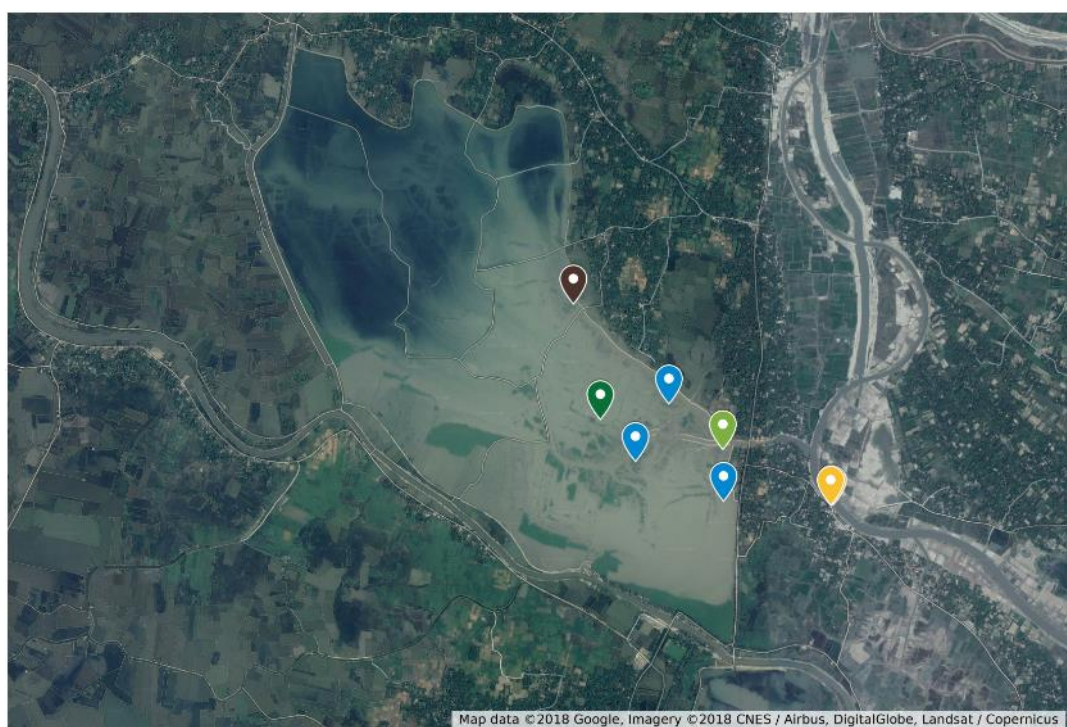


Figure: Location of the sample collection points (Satellite image courtesy: Google)

To monitor the sedimentation and land level change inside the beel, there were 6 poles posted and referenced with PWD datum previously. In the first 3 points nearer the link canal mouth the sedimentation height was about 2 to 2.5 cm. The E point has faced most 3 cm and rest are less than 1 cm reading.

Laboratory analysis: On 7 April, after arriving in Khulna University, with the help of Ms. Morjina, Ms. Nureza explored Laboratories Namely ‘Soil, Water and Air Research Lab’ and ‘Environmental Microbiology Lab’ and understood their facilities, present condition of the collected soil and water samples, parameters to be analyzed etc. About 12 water samples were analyzed to measure Chloride anion.

The next two days I prepared about 21 soil samples for acid digestion (by Nitric acid and Perchloric acid) and after digesting the soils, 50 ml of each samples were prepared adding distilled water for further analysis.

On 9 April, 6 soil samples were also prepared for textural analysis by hydrometer method. These samples were kept overnight and on the next day, we made 1000 ml solution and took into a cylinder. The samples were mixed properly for 10 minutes and we started taking readings at fixed intervals (10 sec, 30 sec, 1 min,....., 8 hours, 12 hours etc.).

Mr. Nazim has done hydrometer test of some of his water samples for grain size distribution and settling velocity.

Discussion

The cross dam on the Kobadak River was constructed on 9 April which was previously planned to construct at 19 March. Due to the construction the Tidal prism has changed significantly.

Though no settlement observed this time, settlement of monitoring pole will lead us to get wrong data. So it is important update reference levels each time before collecting sediment deposition data.

Concluding Remarks

All the events have gone as planned. The samples collected from Kobadak River and Beel were sent to Khulna University for laboratory analysis. Images of the field visit were uploaded to the archive link: <https://tinyurl.com/7thvisitLP>

Photos



Image 1: Flow velocity measurement at Kobadak River



Image 2: Sediment deposition inside the beel.



Image 3: Cross dam construction in Kobadak River



Image 4: Cross dam construction in Kobadak River



Image 5: Cross dam construction in Kobadak River



Image 6: Hydrometer tests to determine soil texture



Image 7: Sample preparation for testing

Annex

Field Visit Plan

Date	Descriptions	Remarks
6 th April Friday	Leaving for Khulna	
7 th April Saturday	Arriving Khulna, equipment testing , Leaving for Tala, Managing boats, Equipment set up	
8 th April Sunday	Neap tide Sampling	
9 th April Monday	Leaving for Khulna, Laboratory analysis	
10 th April Wednesday	Laboratory analysis and Leaving for Dhaka	
16 th April Saturday	Arriving Khulna, Leaving for Tala, Equipment set up	
17 th April Sunday	Spring tide sampling	
18 th April Monday	Leaving for Khulna	

Contact List

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