



## Case Study

### The Realization of a Monitoring Network in Bangladesh

#### CHALLENGE

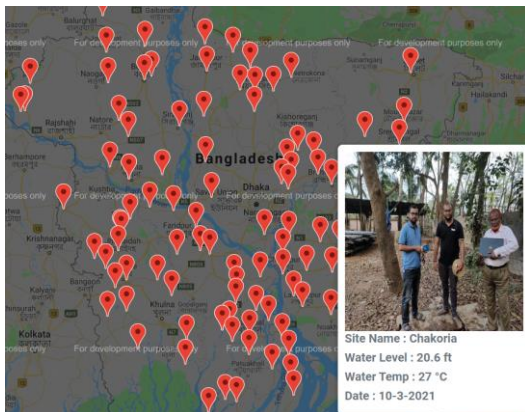
Realization of a monitoring network in Bangladesh for the monitoring of groundwater trends implemented by the Department of Public Health & Engineering (DPHE).

#### SOLUTION

Installation of 121 TD-Divers, currently with manual data collection. Transition to telemetry using Diver-Link in progress.

#### RESULTS

The results look promising. All the instrumentation is working correctly. DPHE is pleased with the results, both for the installation as well as for the data presented.



#### Introduction

Bangladesh is situated north of the Bay of Bengal. The size of the country is 148,460 km<sup>2</sup> and the population is 163 million. It has an average density of around 1098 peoples per square kilometer, but in the big cities like Dhaka and Chittagong the density is even higher. The elevation is 30 feet above sea level but in the coastal belt it is lower. One third of Bangladesh is surrounded by the Indian boarder through land and the rivers the Brahmaputra and the Ganges.

The Indian Government has made several barrages in both rivers at higher elevation to control the flow of water and divert the water to other areas for irrigation by excavating channels. The flow of water in the common rivers is now under contractual agreement between the two countries. As a result there is an enormous impact on the availability of water in the northern area of Bangladesh during the dry season, due to the fact that the rivers have a minimum flow of water. In the rainy season however, the rivers contain a huge amount of water, causing flooding.

Ecologically it has a long term negative impact on the aquifer - in the dry season recharge of water is rationally very low when water levels are going down abnormally. In the south, the coastal belt, salinization of groundwater is increasing. On the other hand, wide urbanization & industrialization is also blocking the natural ground water recharge. So, the recycling of water is not sufficient to compensate for growing domestic, industrial and irrigation use - every year groundwater levels are going down gradually.

#### Monitoring of Groundwater Levels

The government of Bangladesh has made long term plans to secure the availability of sweet groundwater and keep away the aquifers from salty water. It has given high priority to introduce continuous monitoring of groundwater levels & quality throughout the country step by step.

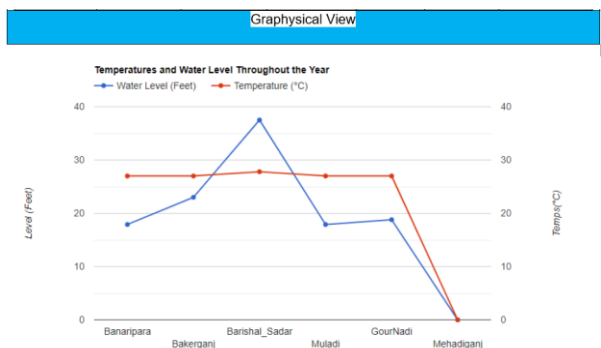
DPHE, the Department of Public Health & Engineering, is one of the entities involved in implementing this project. In the first phase, 121 TD-Divers have been installed for measuring water levels. In the next phase this number will be increased. Also DPHE has a plan to convert all conventional data loggers into a realtime monitoring system for remote data acquisition.



## Installation Sites

Symbex has been deploying the 121 TD-Divers all over the country. To present the data to DPHE and other stakeholders, Symbex has developed its own Data Monitoring Software. Presently the data of the 121 remote sites is downloaded manually and imported into the Data Monitoring Software. The current experience is that it is difficult to convince the local people to download the data on a regular basis, even after training and support from Symbex. To make this project more efficient and have data available for DPHE to develop rules and regulations to maintain a sustainable groundwater system, the next step will be to automate the sites using a telemetry solution. Symbex is also planning provide in person training more intensively.

| Data Table   |                  |                |                |                |               |                    |
|--|------------------|----------------|----------------|----------------|---------------|--------------------|
| Report of monitoring Points Under Barisal, Barisal |                  |                |                |                |               |                    |
|  | Banarip ara      | Barisal Sadar  | Barisal Sadar  | Mul adi        | Gour nadi     | Mehendig anj       |
| Site Name  | Banarip ara      | Bakerganj      | Barishal_Sadar | Muladi         | Gour Nadi     | Mehadiganj         |
| Site Location                                      | 22.7802, 90.1637 | 22.538, 90.347 | 22.705, 90.351 | 22.912, 90.406 | 22.97, 90.227 | 22.8255, 90.5270   |
| Assignee name                                      | Mr. Nizam Uddin  | Mr. Hawlader   | Mr. Abu Saleh  | Mid Ajjad      | Ms. Cham pa   | Mid. Mamun Hossain |
| Last Data Time                                     | 22-02-2021       | 22-02-2021     | 18-02-2021     | 23-02-2021     | 24-03-2021    | 02-02-2021         |
| Water Level  | 17.9 feet        | 23 feet        | 37.5 feet      | 17.9 feet      | 18.8 feet     | 00 feet            |
| Water Tem.   | 27 Celcius       | 27 Celcius     | 27.8 Celcius   | 27 Celcius     | 27 Celcius    | 00 Celcius         |



## Remote Data Acquisition

Symbex is developing remote data acquisition software that communicates to the telemetry units in the field. The reason for this is that the majority of end-users in Bangladesh want to have the data presented, not having the responsibility for the telemetry monitoring network.

Currently the acquisition software is getting its data from one Diver-Link telemetry modem, which is sending data to the local Symbex ftp-server. The next step will be to integrate another four Diver-Links with TD-Divers that are already installed at the remote sites for test purposes. After successful demonstration, Symbex will propose DPHE to install Diver-Links in their monitoring network. In the 1st graph the green icon is showing the status of the Diver-Link modem and communication. In case the data of a location is not getting to the ftp-server the icon turns grey as can be seen in the same graph.

## Current Situation

Symbex has been deploying all the TD-Divers successfully. In the current situation the data is downloaded using the Diver-Mate. This device is collecting the data automatically as soon as it is connected to the DXT-cable with which the Diver is deployed. The results look promising. All the instrumentation is working correctly. DPHE is pleased with the results, both for the installation as well as for the data presented.

### Symbex, Bangladesh

<https://symbexbd.com/>



TD-Diver and Diver-Mate



Diver-Link telemetry modem

