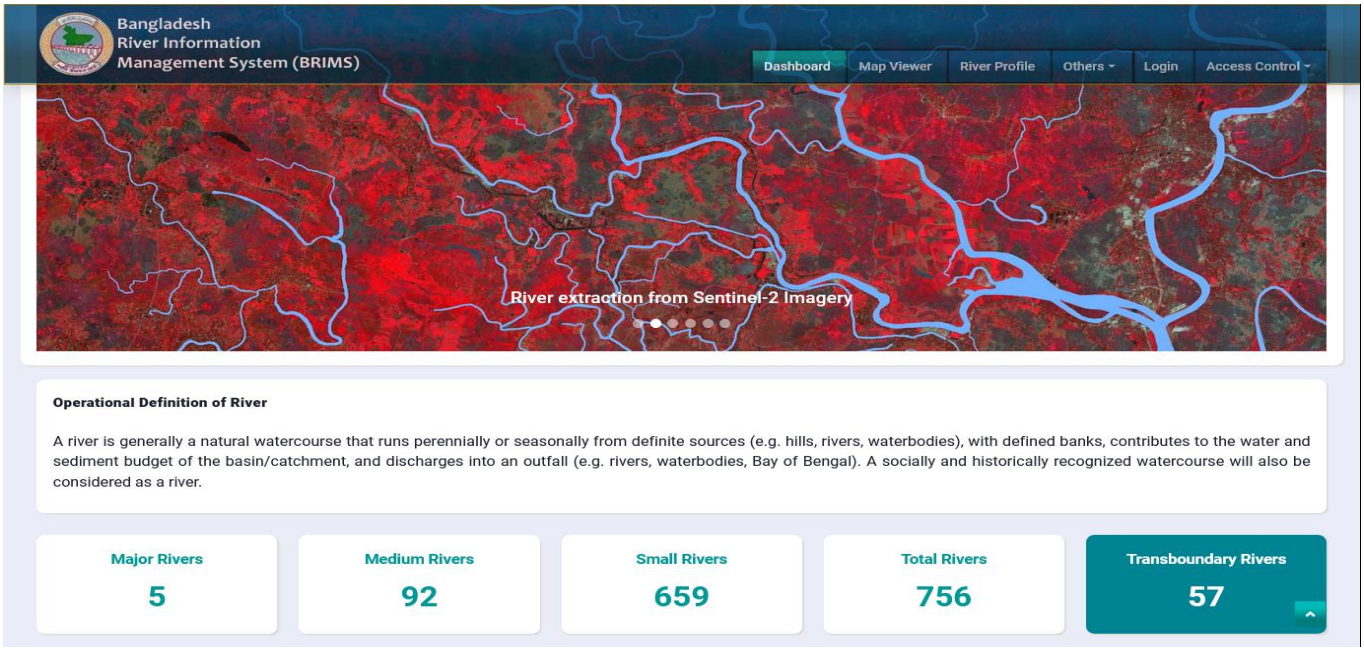
USER MANUAL
ON
BANGLADESH RIVER INFORMATION MANAGEMENT SYSTEM (BRIMS)



Developed by
Center for Environmental and Geographic Information Services (CEGIS)

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1. Introduction

The Bangladesh River Information Management System (BRIMS) is a comprehensive web-based GIS application developed to provide detailed information and management tools related to rivers in Bangladesh. BRIMS aim to facilitate efficient management and decision-making regarding Bangladesh's river systems. It serves as a centralized platform for accessing and analyzing river-related data for various stakeholders, including government agencies, researchers, and policymakers. BRIMS integrates diverse datasets related to rivers, including hydrological, ecological, and socio-economic data. Data sources may include satellite imagery, remote sensing data, ground-based measurements, and government databases. BRIMS provide interactive maps that display various river features, including river networks, tributaries, water quality parameters, and flood risk zones. Users can visualize spatial data layers and overlay different datasets to gain insights into river dynamics and associated phenomena. The system is designed to be user-friendly, with intuitive interfaces and interactive features for easy navigation. BRIMS serve as a valuable tool for river management and decision-making, offering integrated data, mapping, analysis, and decision support capabilities to support sustainable development and resilience.

1.1 System Architecture of the Portal

The portal has been designed and developed using the standard four-tier architecture of software development. It consists of the following layers:

- Presentation (user-interface)
- Web server
- Application server
- Data server

- ***Presentation Layer***
  The presentation layer represents user-interfaces that a user uses to interact with the application. This layer has been developed using ASP .Net. HTML5 and CSS3 with jQuery are also used to develop the user interface. The design and look of the interfaces have been made simple and user-friendly.
- ***Web server***
  The main service component for a web-based application is the web server. It is a program that manages and delivers web pages and allows users to communicate with the server for data service through the Internet or the intranet. The web server is configured using Internet Information Services.

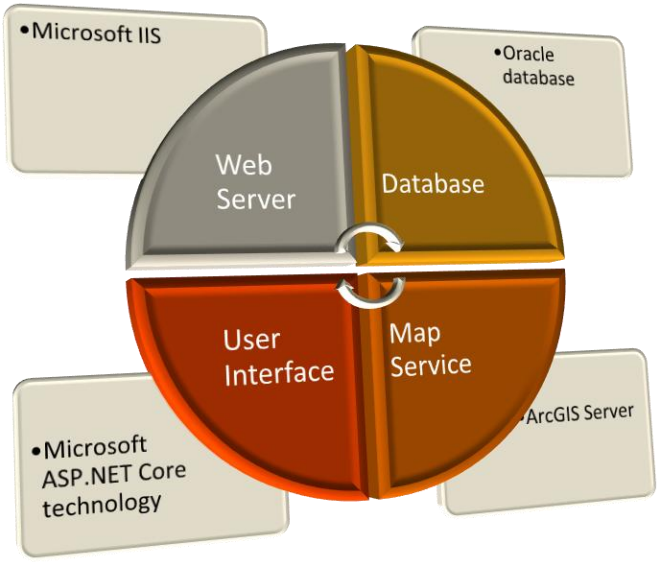


Figure 1.1: System Architecture

- ***Application Server***
  The application layer is the main development area which consists of business and data components. The business component is used to impose different business rules and logics. The data component is responsible for retrieving data from the server. The application layer has been developed using Asp .Net Core.
- ***Data Server***
  The data server contains data, views, triggers and stored procedures. It executes SQL statements, views, triggers and stored procedures for data manipulation and presentation. A relational database Oracle is used to store and organize data.

1.2 Technology Used

The following technology has been used to develop BRIMS in different components:

- Programming Language: C#, Java Script
- Framework: Microsoft .NET framework 8
- Database: Oracle 19c
- Map service: ArcGIS Server

1.3 Dashboard

The Dashboard of the BRIMS is presented in Figure 1.2.

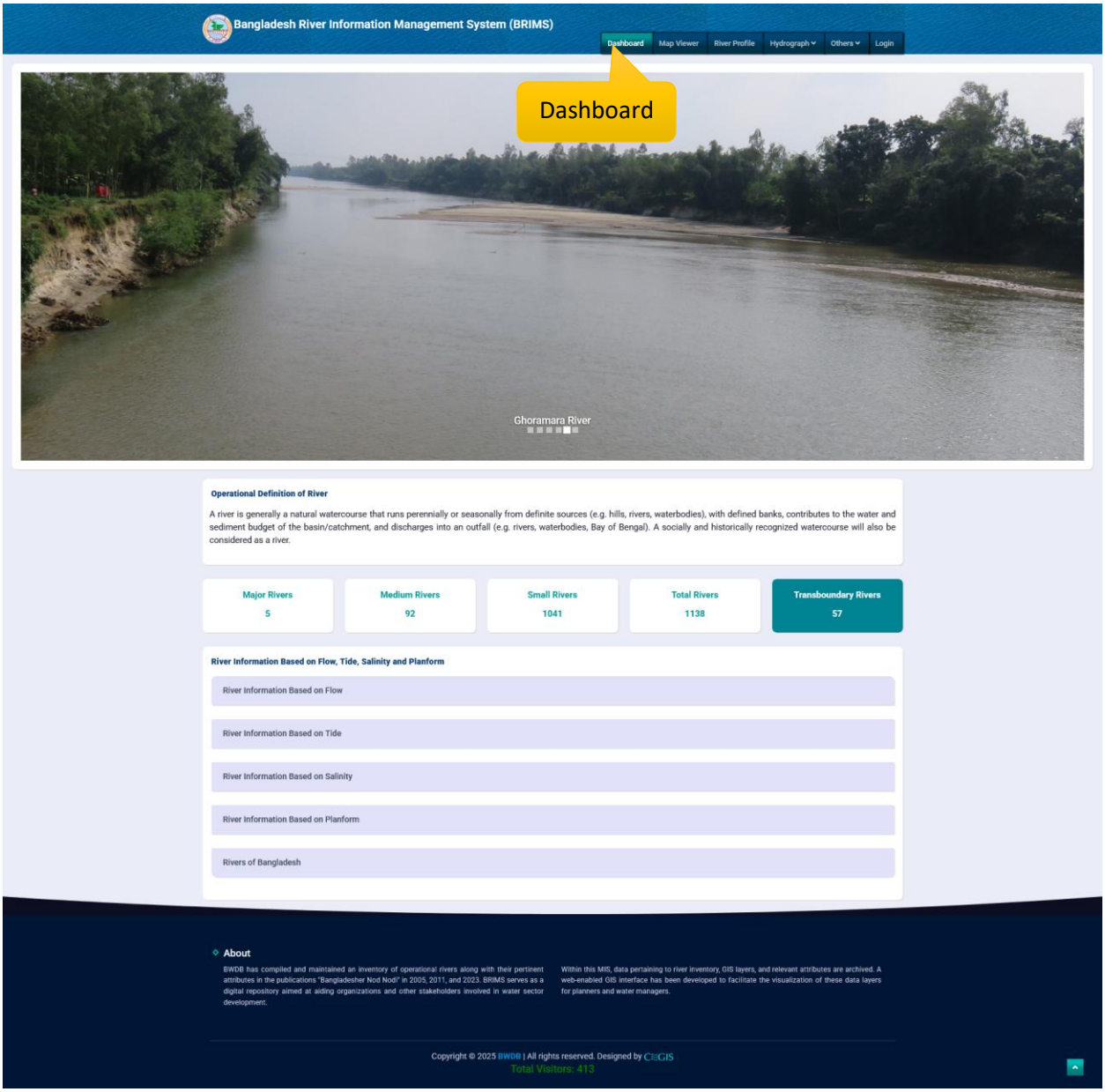


Figure 1.2: Dashboard screen of the BRIMS

2. *Major Components of BRIMS*

The major components of the BRIMS are as follows:

1. Dashboard
2. River Profile
3. Map Viewer
4. Other (User manual, Video Tutorial, Contacts and Feedbacks)
5. User (Access Control)

2.1 User Login

User login is required when any user will add, edit or delete data then login is mandatory. To login put the mouse pointer to the **Login** menu then click on Login (Figure 1.3).

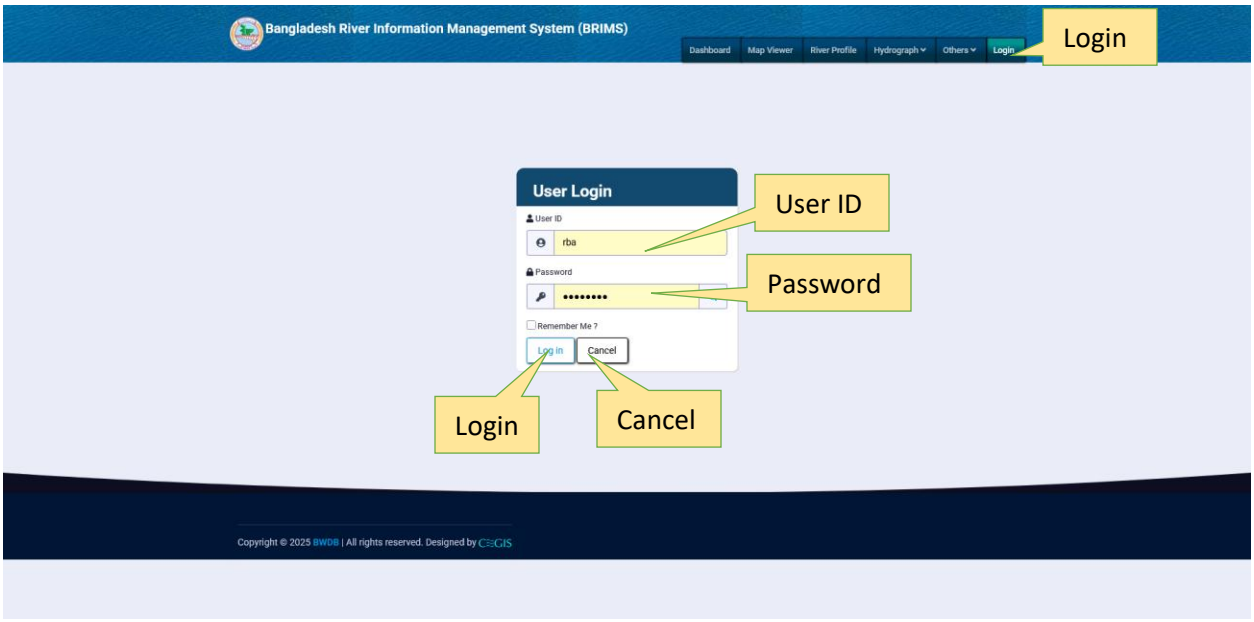


Figure 1.3: Login UI

2.2 Dashboard

The Dashboard is the home page which contains menu options, image slider, counting's of different river types and categories and some summery reports (Figure 2.1). These summery reports are Percentage of River Types in Pie chart, Hydrological Region wise River counting in Tabular format and a digital Map.

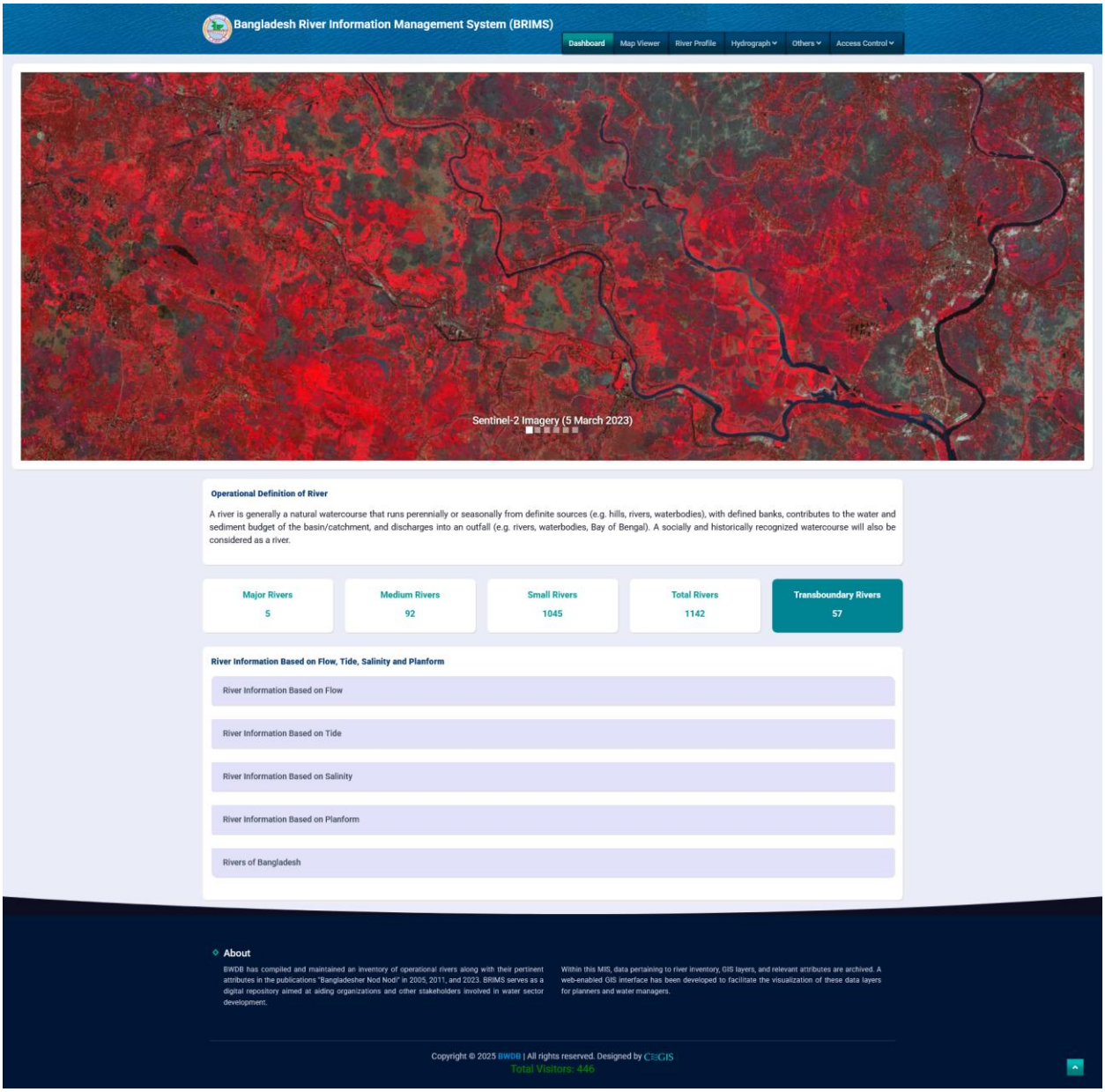
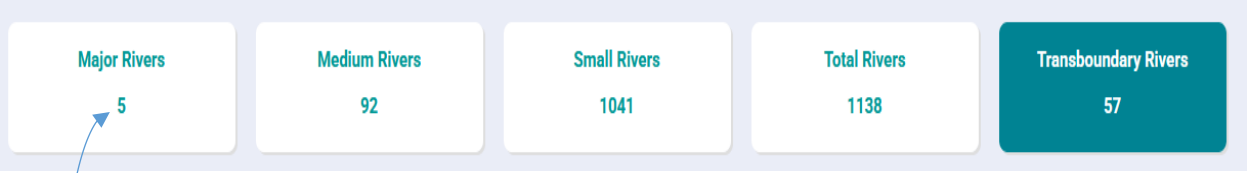


Figure 2.1: Dashboard



There are some clickable links in dashboard to view tabular data (Figure 2.2).

Figure 2.2: Clickable links to view data

Click on these links to view tabular data (Figure: 2.3)

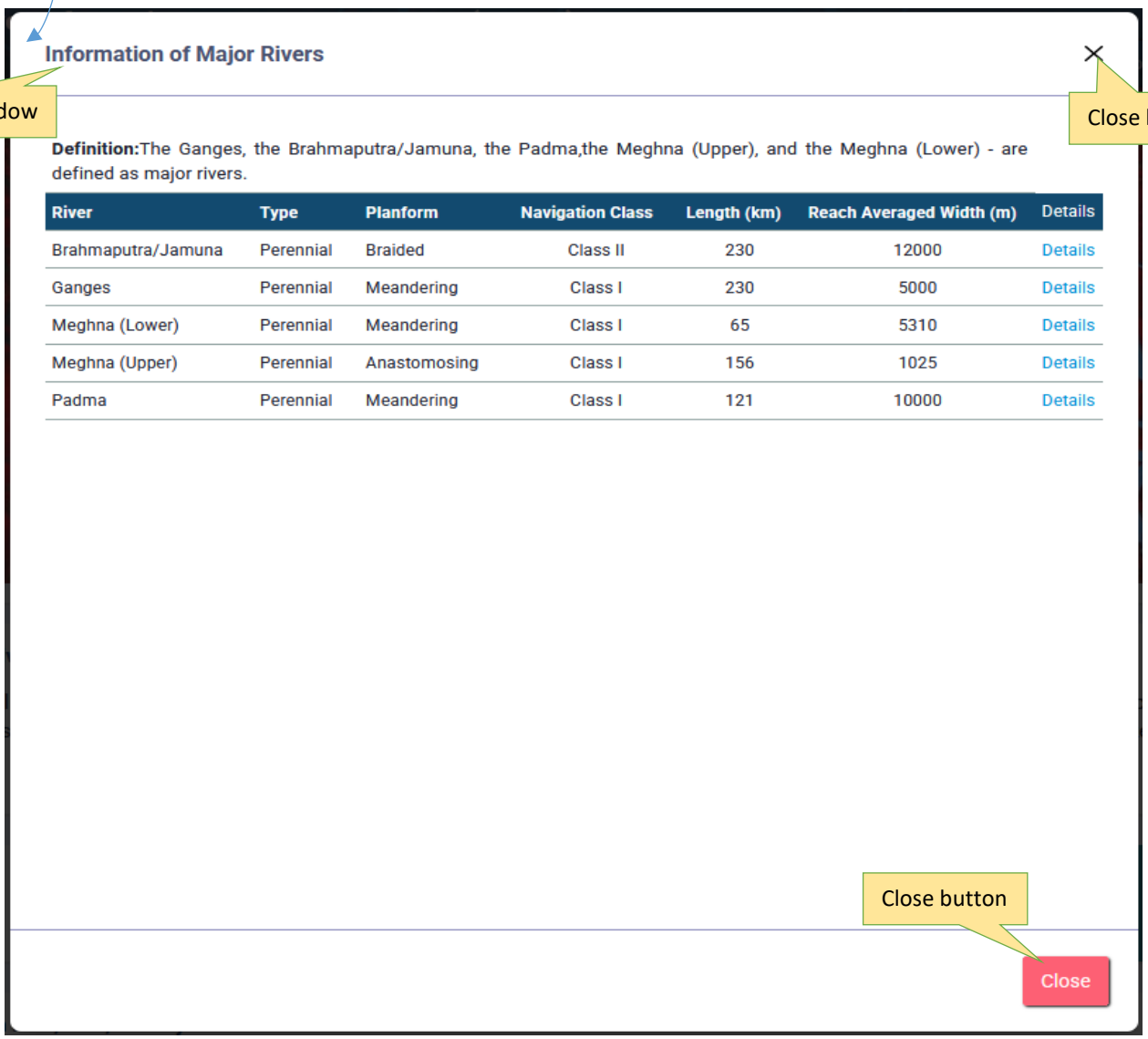
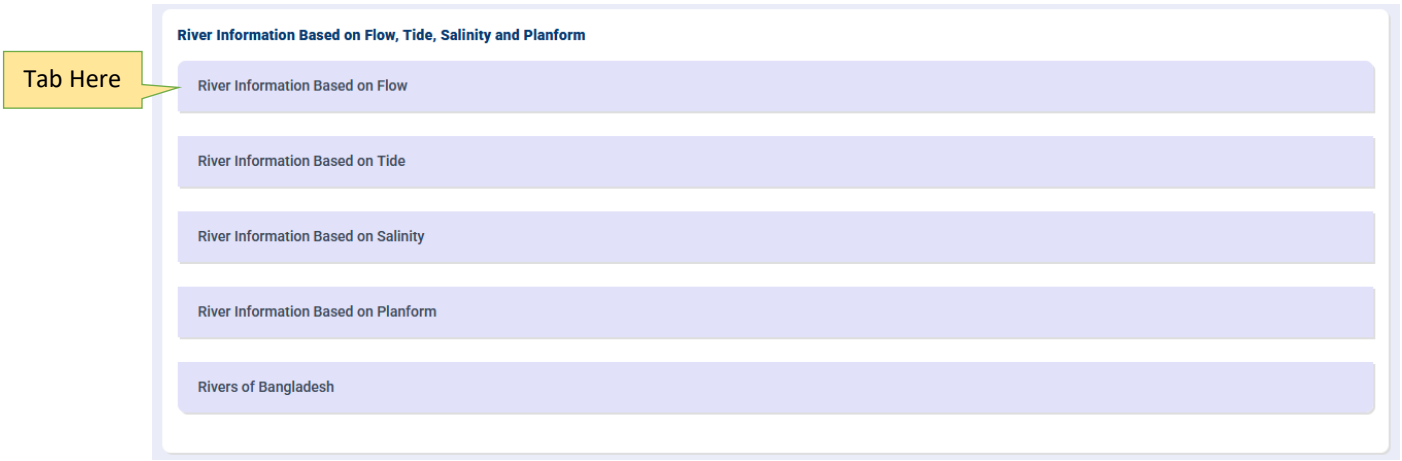


Figure 2.3: River Information using POPUP

After this we see **River Information Based on Flow, Tide, Salinity and Planform** section. This section contains five collapsible tabs, each representing a different category of river information:

1. **River Information Based on Flow**
2. **River Information Based on Tide**
3. **River Information Based on Salinity**
4. **River Information Based on Planform**
5. **Rivers of Bangladesh**

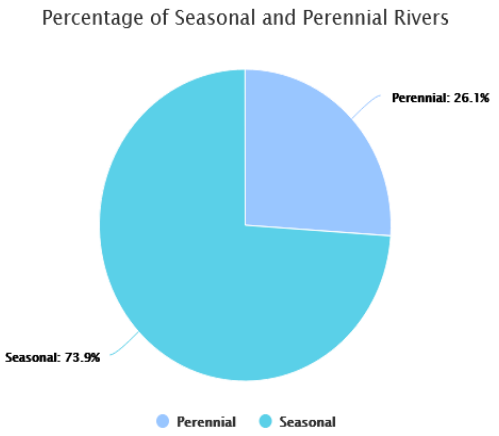


1. The image shows the "**River Information Based on Flow**" section, which includes:
   - A Table of Hydrological Regions
     - Displays the number of Seasonal Rivers and Perennial Rivers across different regions.
     - The Total column sums both types of rivers for each region.
     - The overall total is 1,138 rivers, with 841 seasonal rivers (73.9%) and 297 perennial rivers (26.1%).
   - A Pie Chart
     - Visually represents the proportion of Seasonal and Perennial Rivers.
     - Seasonal Rivers make up 73.9% of the total.
     - Perennial Rivers account for 26.1%.

This section helps in understanding the distribution of rivers based on their flow characteristics across various hydrological regions.

River Information Based on Flow

Hydrological Regions	Seasonal Rivers	Perennial Rivers	Total
North-West	285	28	**313**
North-Central	80	23	**103**
North-East	305	21	**326**
South-West and South-Central	97	191	**288**
South-East	53	24	**77**
Eastern-Hills	21	10	**31**
Total	841	297	1138



Click Here

River Information

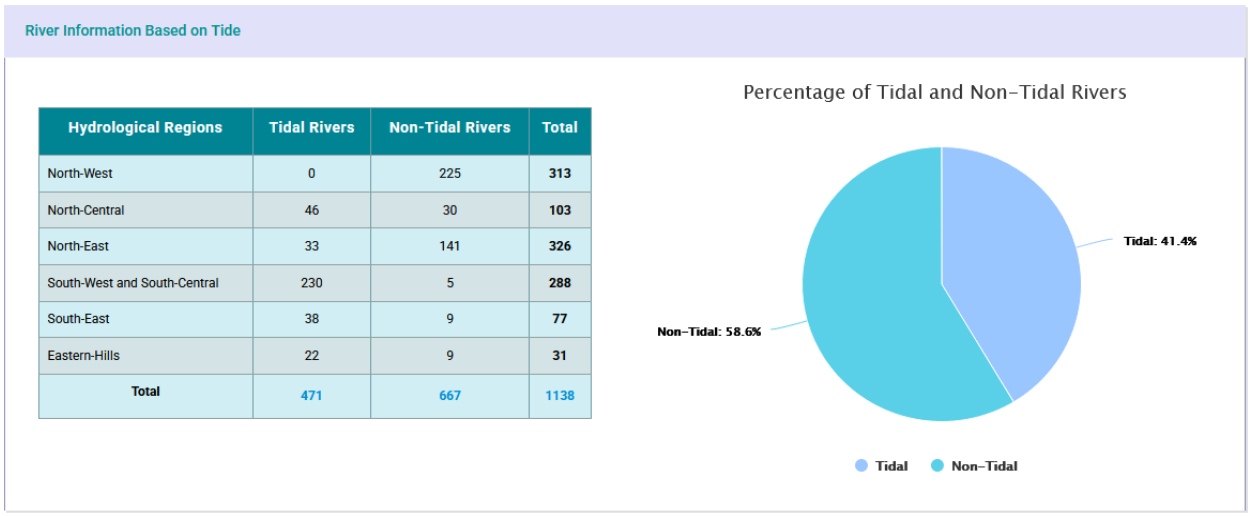
River	Type	Planform	Navigation Class	Length (km)	Reach Averaged Width (m)	Details
Adi Jamuna	Perennial	Meandering	-	0	0	Details
Agorpur	Perennial	Meandering	-	0	0	Details
Agun Mukha	Perennial	Meandering	Class I	20	2525	Details
Algi	Perennial	Meandering	-	19	20	Details
Amtali	Perennial	Meandering	-	19	18	Details
Andarmanick	Perennial	Meandering	Class I	42	180	Details
Arci	Perennial	Meandering	-	0	0	Details
Arial Khan	Perennial	Meandering	Class II	154	115	Details
Arial Khan Narsingdi (Lower)	Perennial	Meandering	Class III	31	40	Details
Arial Khan Narsingdi (Upper)	Perennial	Meandering	Class III	19	55	Details
Arpangasia	Perennial	Meandering	Class I	58	1105	Details
Arpangasia (Barguna)	Perennial	Meandering	-	31	10	Details
Asokathi	Perennial	Meandering	-	9	20	Details
Atai	Perennial	Meandering	Class II	17	180	Details
Atrai	Perennial	Meandering	Class III	217	30	Details
Atrai (Naogaon-Natore)	Perennial	Meandering	-	33	70	Details
Ayla	Perennial	Meandering	Class II	0	0	Details
Baleswar	Perennial	Meandering	Class I	137	10	Details
Balu	Perennial	Meandering	Class II	44	20	Details
Balu (Sunderban)	Perennial	Meandering	-	34	259	Details

Close

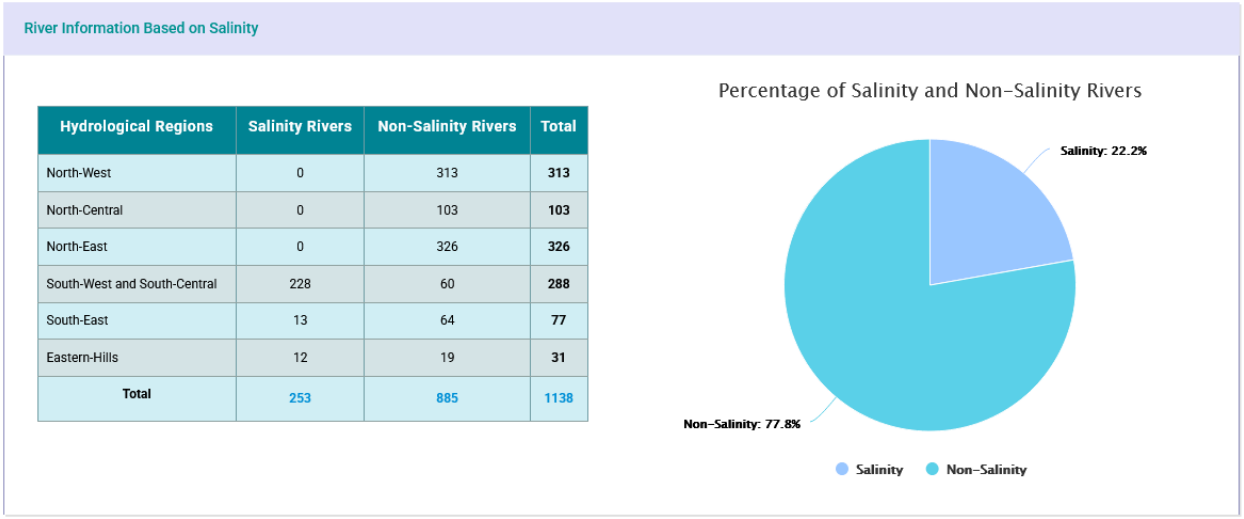
2. The image shows the " **River Information Based on Tide**" section, which includes:
   - A Table of Hydrological Regions

     - It categorizes rivers into Tidal Rivers and Non-Tidal Rivers across different regions.
     - The Total column sums both types of rivers for each region.
     - The overall total is 1,138 rivers, with 471 tidal rivers (41.4%) and 667 non-tidal rivers (58.6%).

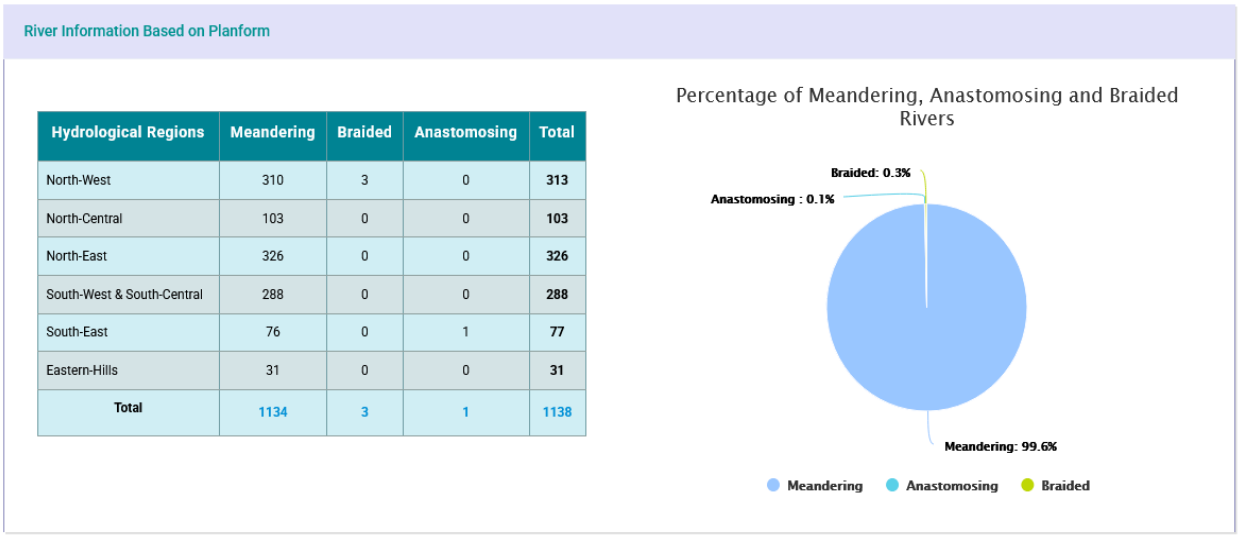
   - A Pie Chart
     - Visually represents the proportion of Tidal and Non-Tidal Rivers.
     - Non-Tidal Rivers make up 58.6% of the total.
     - Tidal Rivers account for 41.4%.



3. **River Information Based on Salinity** (Same as previous section image)



4. **River Information Based on Planform** (Same as previous section image)



2.2 Map Viewer

This module has been designed to display and analyze spatial data with Zoom-in, zoom-out, pan, super-impose and other standard facilities of spatial data viewer. The Map Viewer also provides facilities to view identity and attribute information of the spatial data layers. Powerful search capabilities for rivers have been added to find target information with zone, Admin Boundary and River wise. Initially loaded all river information in the system. Users can be shown the specific river details information by clicking the target river as a Popup View. In this popup view for some parameters like water level, Discharge and Rainfall, the action buttons are added to view Hydrological Status, Frequency Analysis and Data Availability.

While adding data such as water level or discharge, then added summary information of those parameters information in the left panel. The Map Export feature has also been incorporated into this system.

1.1 View River Information

In the Map Viewer Module, user can view river data with geological location and many analytical data on the map dynamically (Figure 3.1).

The image displays a panel titled **"Data Layer View and Analysis"** with the following elements:

1. **Dropdown: Data Layer Selection**
   - Example value: "Satellite".
2. **Button: Reset Selection**
   - Clears selections and resets filters.
3. **Expandable Section: River Selection By**
   - **Checkbox: Name**
   - **Toggle: River Label**
   - **Checkbox: Hydrological Region**
   - **Checkbox: Admin Boundary**
4. **Button: View Report**

- Generates a report based on selected criteria.

5. **Collapsible Sections:**
   - **Data Layers**
   - **Frequency Analysis**
   - **Hydrological Status**
   - **Data Availability**

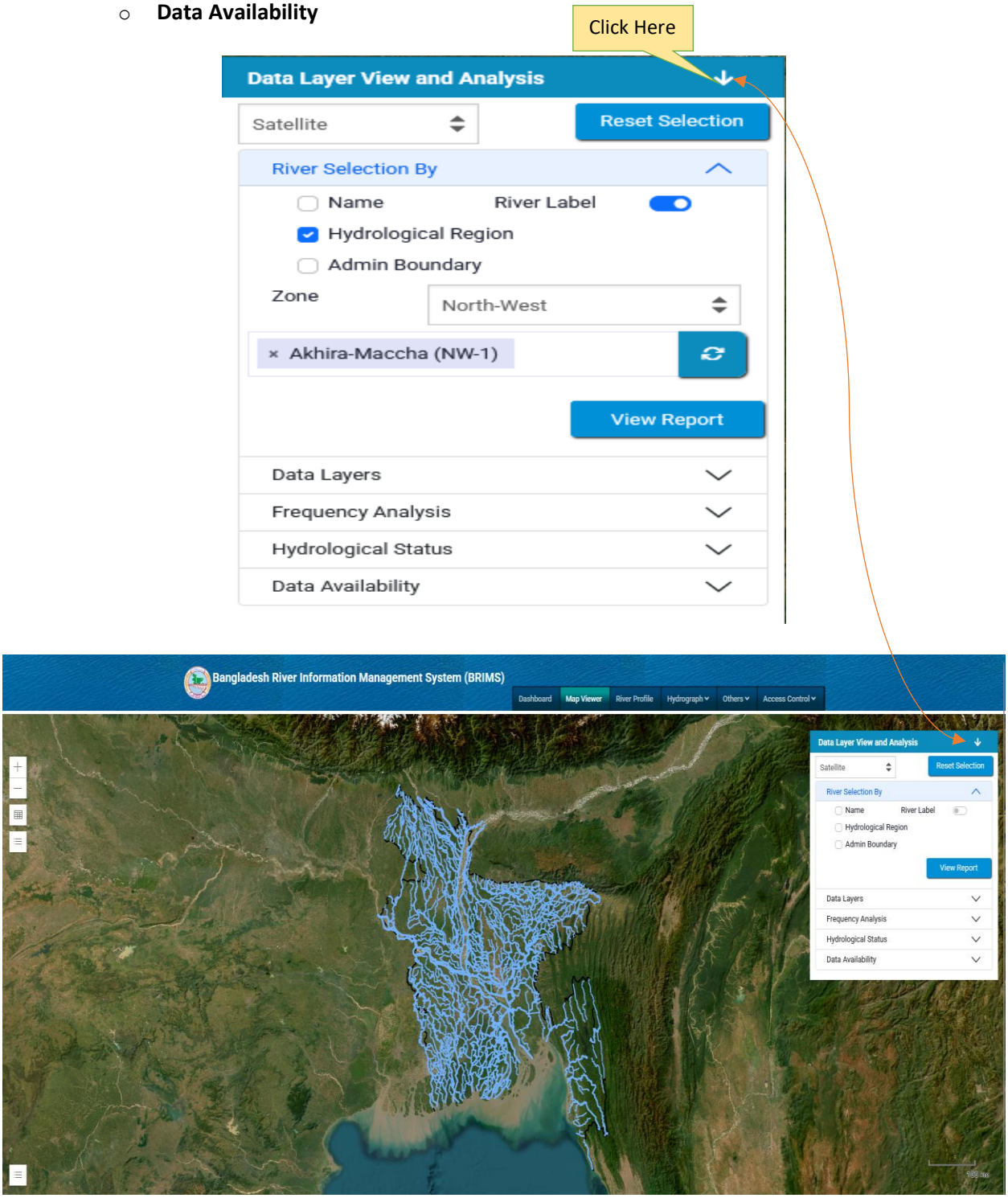


Figure 3.1: Map Window

Users can be able to find a river using three options (Admin Boundary, Hydrological Zone and River) (Figure 3.2)

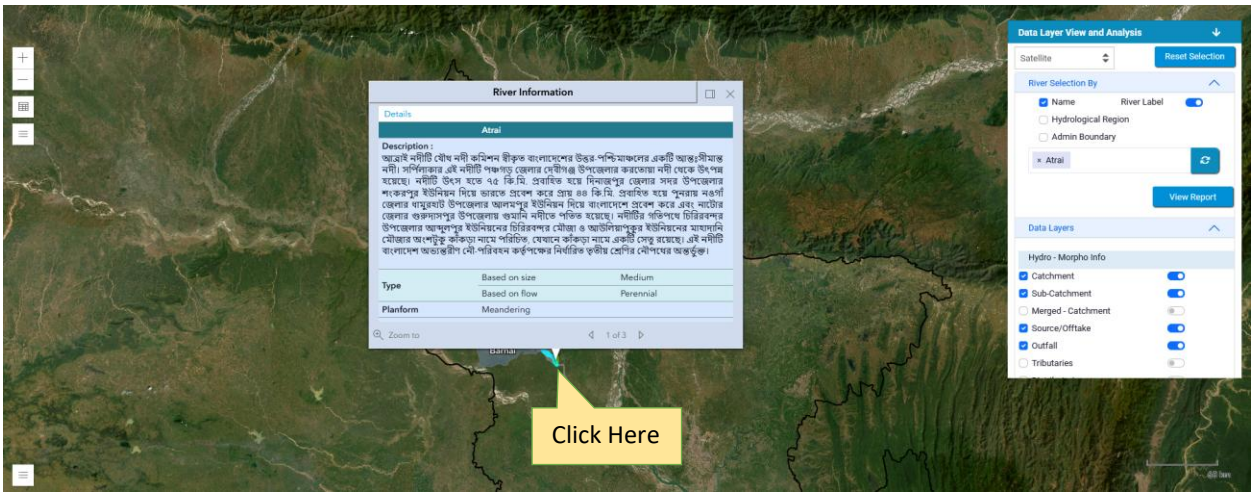


Figure 3.2: View River Information

1.2 Searching River using 'river' option (Figure: 3.3, 3.4)

Step 1: Select 'Name' option from the search options

Step 2: Then search river name as 'atrai' on the search-box and rivers will be displayed

Figure 3.3: Result for Searching River using 'river' option

1.3 Searching River using ‘Hydrological Region’ option (Figure: 3.4, 3.5)

Step 1: Select ’Hydrological Region’ option from the search options

Step 2: Select a Zone from the drop-down list and rivers will be displayed

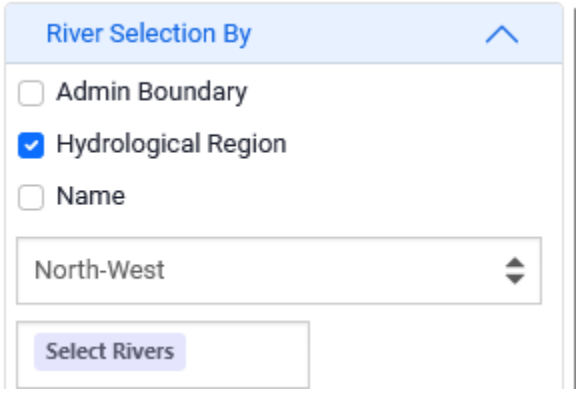


Figure 3.4: Searching River using ‘Hydrological Region’ option

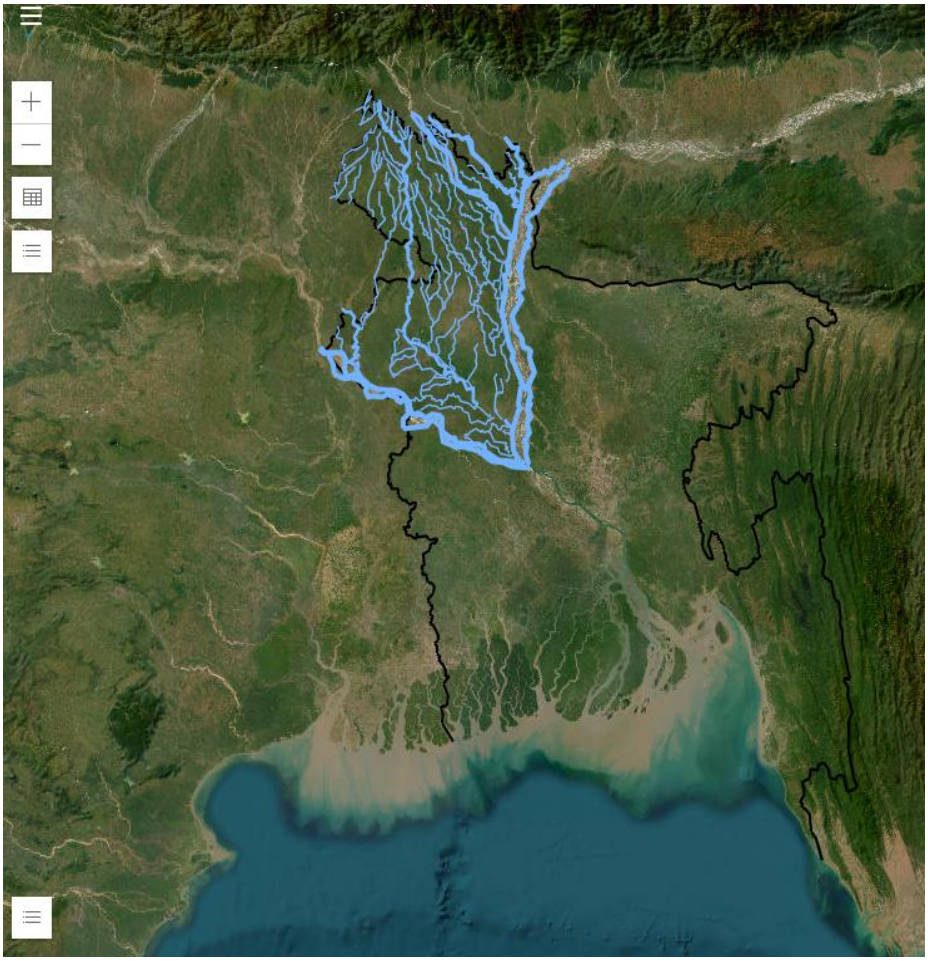


Figure 3.5: Result of Searching River

1.4 Select rivers from list and rivers will be displayed (Figure 3.6)

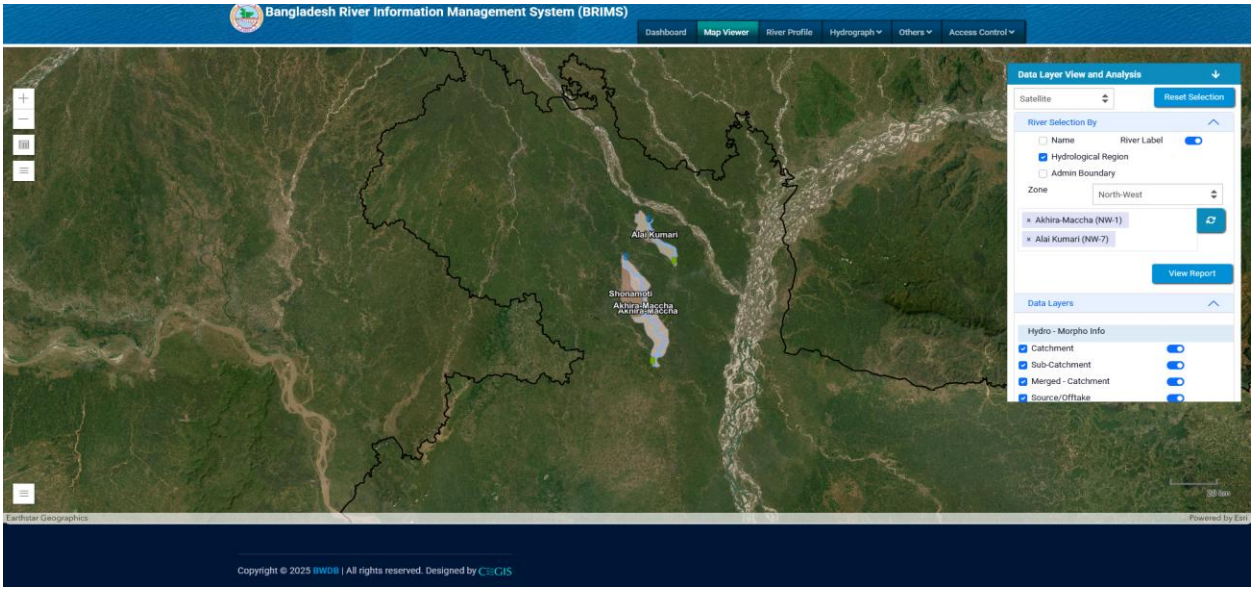


Figure 3.6: Searching River using 'Hydrological Region' option using list

1.5 Searching River using 'Admin Boundary' option (Figure 3.7. 3.8)

Step 1: Select 'Admin Boundary' option from the search options

Step 2: Select a Division Name as 'Dhaka' from the drop-down list and maps will be zoom to the selected Division.

Step 3: Select a District Name as 'Narsingdi' from the drop-down list and maps will be zoom to the selected District.

Step 4: Select an Upazila Name from the drop-down list and map of the source will be displayed.

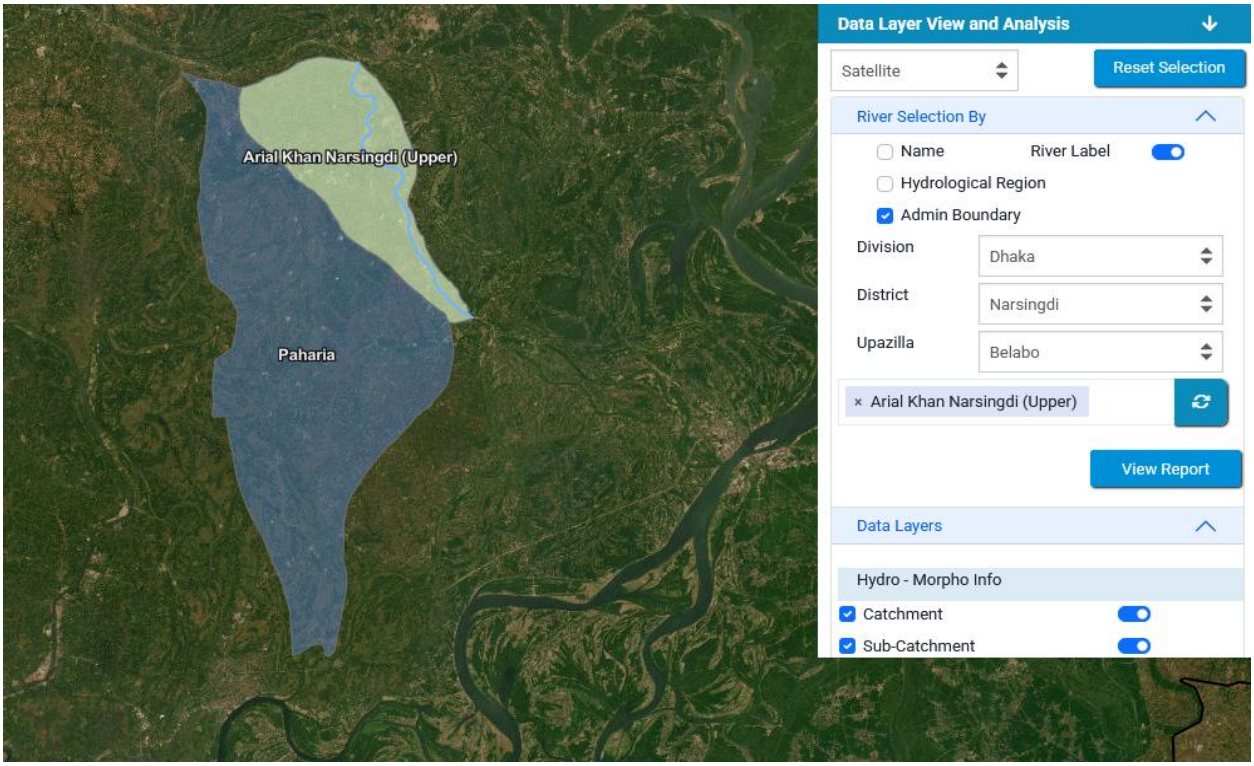
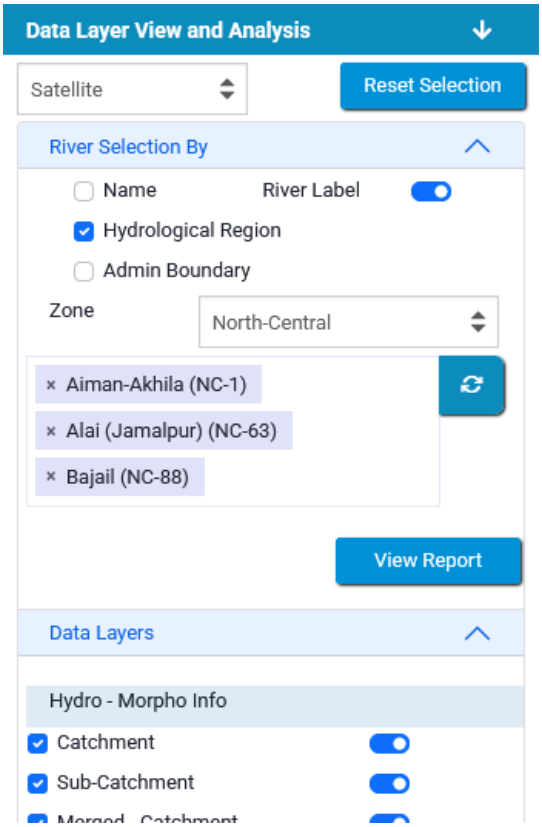


Figure 3.7: Searching River using 'Admin Boundary' option



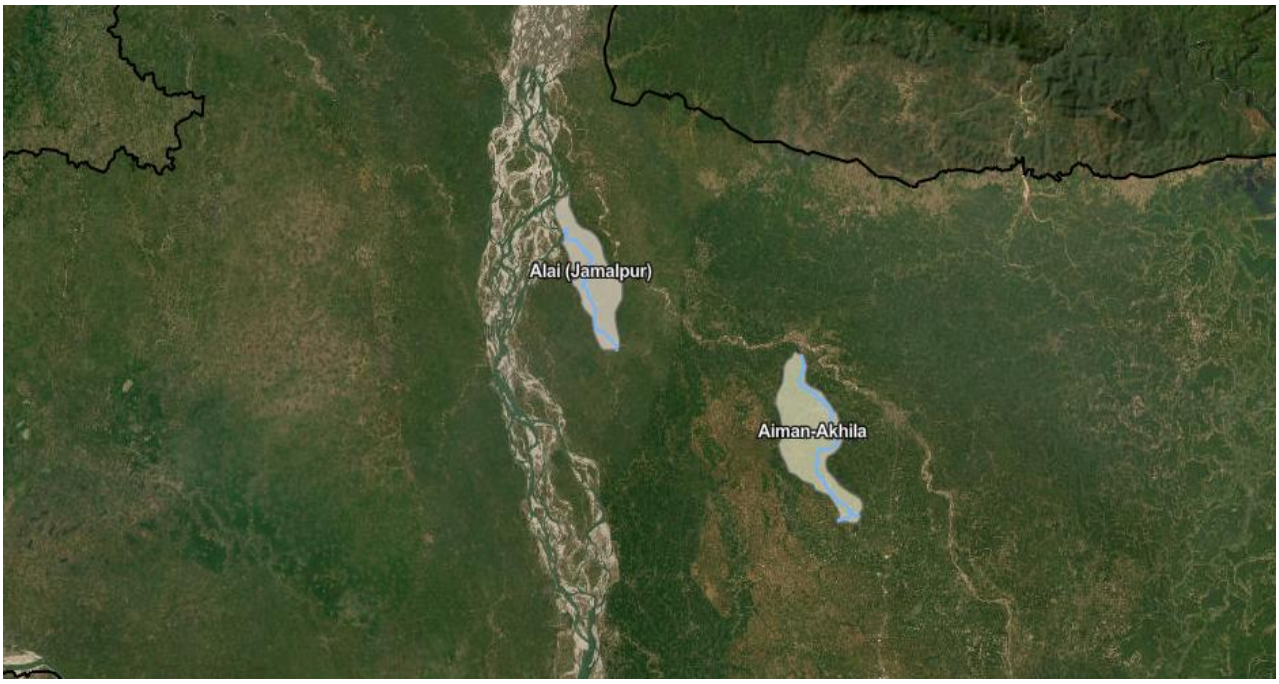
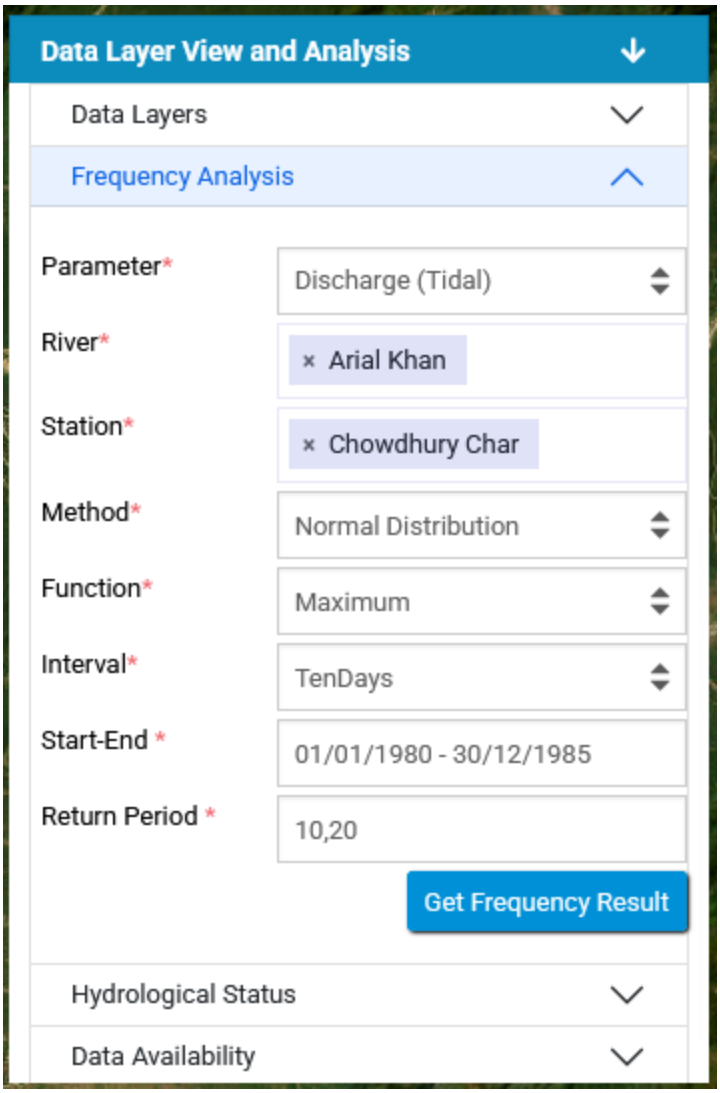


Figure 3.8: Display Result of Searching River using 'Hydrological Region' option

The image displays a form within a collapsible panel titled **"Data Layer View and Analysis"**, with the **"Frequency Analysis"** section expanded. Below are the input fields present in the form:

1. **Parameter (*)**
    - Dropdown selection (e.g., "Discharge (Tidal)").
2. **River (*)**
    - Multi-select input (e.g., "Arial Khan").
3. **Station (*)**
    - Multi-select input (e.g., "Chowdhury Char").
4. **Method (*)**
    - Dropdown selection (e.g., "Normal Distribution").
5. **Function (*)**
    - Dropdown selection (e.g., "Maximum").
6. **Interval (*)**
    - Dropdown selection (e.g., "TenDays").
7. **Start-End (*)**
    - Date range picker (e.g., "01/01/1980 - 30/12/1985").
8. **Return Period**
    - Text input (e.g., "10,20"), possibly for multiple return periods.
9. **Button: "Get Frequency Result"**
    - Action button to submit the form.

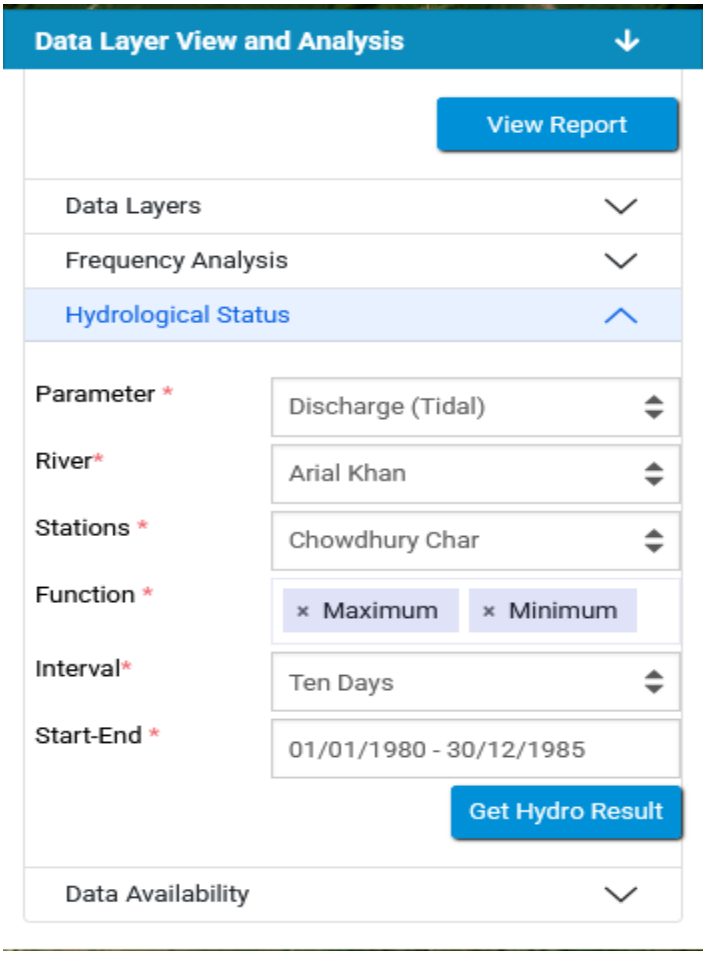

Data Layer View and Analysis
Data Layers
Frequency Analysis
Parameter*
Discharge (Tidal)
River*
× Arial Khan
Station*
× Chowdhury Char
Method*
Normal Distribution
Function*
Maximum
Interval*
TenDays
Start-End *
01/01/1980 - 30/12/1985
Return Period *
10,20
Get Frequency Result
Hydrological Status
Data Availability

Frequency Analysis of Discharge Data

StationId	Return Period	Month	Ten Days	Discharge(m3/sec)
4A	10	January	1	165.34
4A	10	January	2	149.20
4A	10	January	3	162.84
4A	10	February	1	166.04
4A	10	February	2	139.04
4A	10	February	3	119.31
4A	10	March	1	127.00
4A	10	March	2	147.39
4A	10	March	3	169.14
4A	10	April	1	224.96
4A	10	April	2	325.80
4A	10	April	3	291.33
4A	10	May	1	446.91
4A	10	May	2	383.40
4A	10	May	3	519.55
4A	10	June	1	1042.11
4A	10	June	2	1170.98
4A	10	June	3	1499.69
4A	10	July	1	1979.56
4A	10	July	2	2289.59
4A	10	July	3	2605.19
4A	10	August	1	2922.56
4A	10	August	2	2272.83
4A	10	August	3	2406.40
4A	10	September	1	2584.91
4A	10	September	2	2666.18
4A	10	September	3	2948.96
4A	10	October	1	2091.55
4A	10	October	2	1861.88
4A	10	October	3	1726.00
4A	10	November	1	1183.25
4A	10	November	2	883.48

The image displays a form within a collapsible panel titled **"Hydrological Status"**. Below are the input fields present in the form:

1. **Parameter (*)**
   - Dropdown selection (e.g., "Discharge (Tidal)").
2. **River (*)**
   - Dropdown selection (e.g., "Arial Khan").
3. **Stations (*)**
   - Dropdown selection (e.g., "Chowdhury Char").
4. **Function (*)**
   - Multi-select options (e.g., "Maximum", "Minimum").
5. **Interval (*)**
   - Dropdown selection (e.g., "Ten Days").
6. **Start-End (*)**
   - Date range picker (e.g., "01/01/1980 - 30/12/1985").
7. **Button: "Get Hydro Result"**
   - Action button to submit the form.



Statistical Information

Discharge (Tidal) of station

Station ID	Station Name	Year	Month	DaysPart	Maximum Value (m^3/sec)	Minimum Value (m^3/sec)
4A	Chowdhury Char	1980	1	1	16.30	4.36
4A	Chowdhury Char	1980	1	2	4.58	2.94
4A	Chowdhury Char	1980	1	3	4.21	2.02
4A	Chowdhury Char	1980	2	1	3.93	2.11
4A	Chowdhury Char	1980	2	2	13.30	0.89
4A	Chowdhury Char	1980	2	3	9.02	1.13
4A	Chowdhury Char	1980	3	1	8.03	3.63
4A	Chowdhury Char	1980	3	2	15.80	0.92
4A	Chowdhury Char	1980	3	3	16.70	0.83
4A	Chowdhury Char	1980	4	1	4.32	1.57
4A	Chowdhury Char	1980	4	2	26.30	3.85
4A	Chowdhury Char	1980	4	3	80.60	16.90
4A	Chowdhury Char	1980	5	1	434.00	101.00
4A	Chowdhury Char	1980	5	2	330.00	266.00
4A	Chowdhury Char	1980	5	3	372.00	182.00
4A	Chowdhury Char	1980	6	1	386.00	286.00
4A	Chowdhury Char	1980	6	2	951.00	303.00
4A	Chowdhury Char	1980	6	3	1030.00	948.00
4A	Chowdhury Char	1980	7	1	1030.00	935.00
4A	Chowdhury Char	1980	7	2	1510.00	1080.00
4A	Chowdhury Char	1980	7	3	1900.00	1560.00
4A	Chowdhury Char	1980	8	1	1850.00	1800.00
4A	Chowdhury Char	1980	8	2	2160.00	1870.00
4A	Chowdhury Char	1980	8	3	2260.00	2040.00
4A	Chowdhury Char	1980	9	1	2060.00	1900.00
4A	Chowdhury Char	1980	9	2	1860.00	1490.00
4A	Chowdhury Char	1980	9	3	1440.00	1260.00
4A	Chowdhury Char	1980	10	1	1230.00	809.00
4A	Chowdhury Char	1980	10	2	788.00	545.00
4A	Chowdhury Char	1980	10	3	653.00	468.00
4A	Chowdhury Char	1980	11	1	495.00	104.00

1.6 View Report of Details River as Tabular Format

After river selection then Click on 'View Report' Button to view River Details Information (Figure 3.10)

Figure 3.10: Display Result of View Report of Details River as Tabular Format

1.7 Visualize catchment, Tributaries and other parameters like Water Level , Discharge of selected rivers

Step 1: Check on Catchment Checkbox to add catchment layer

Step 2: Check on Tributaries to add Tributaries layer (Figure 3.11).

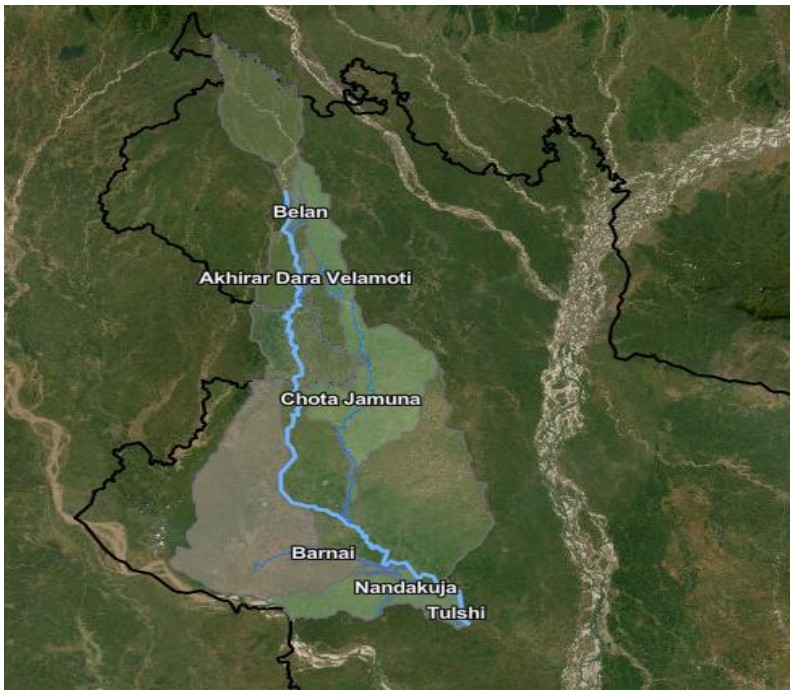


Figure 3.11: Display after adding Catchment layer with tributaries

Step 3: Click on Catchment Portion on Map Window to view catchment Information (Figure 3.12).

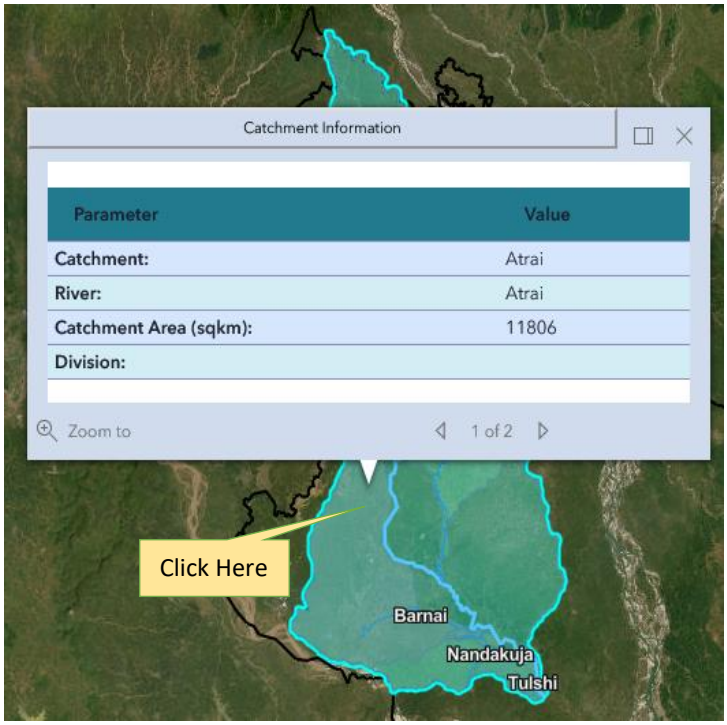


Figure 3.12: Display Catchment Information of Selected River

Step 4: Check on Water Level to add the stations of Water Level of Selected Catchment and click on target station to view data (Figure 3.13)

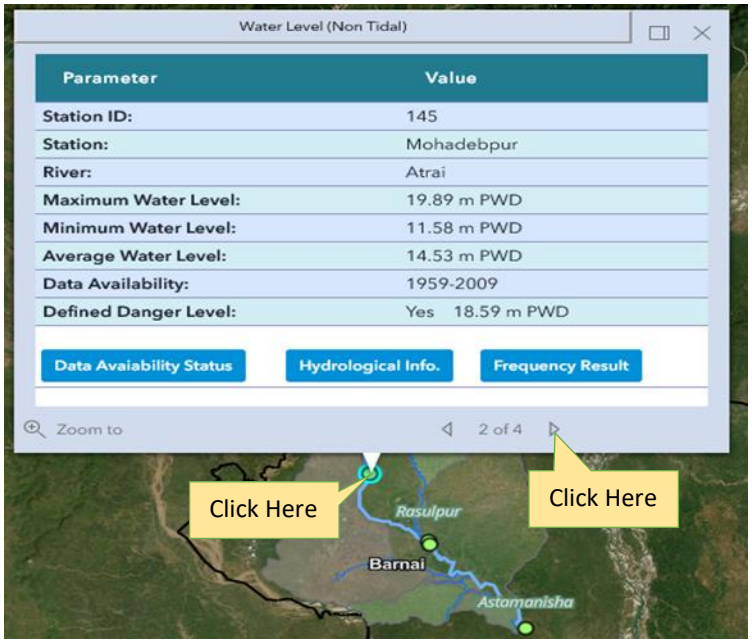


Figure 3.13: Display Water Level Information

Step 5: Check on Discharge to add the stations of Discharge of selected Catchment and click on target station to view data (Figure 3.14).

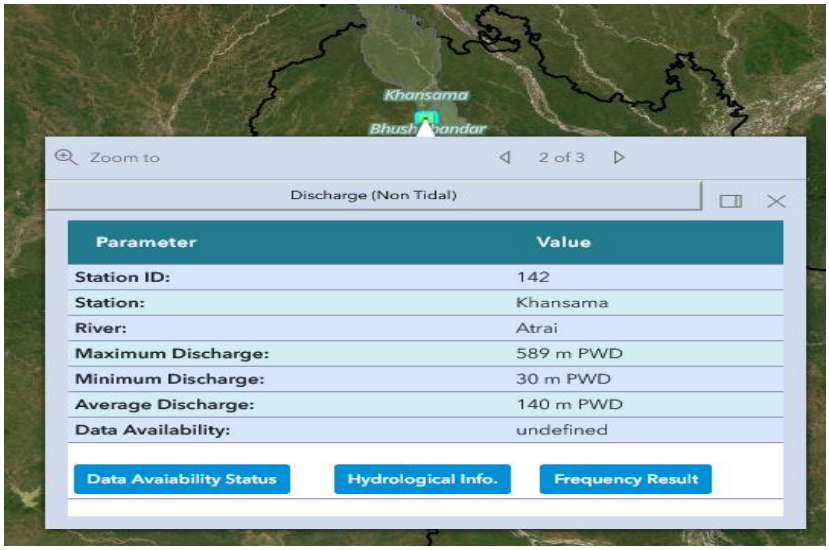


Figure 3.14: Display Discharge Information

Step 6: Check on Rainfall to add the stations of Discharge of selected Catchment and click on target station to view data (Figure 3.15).

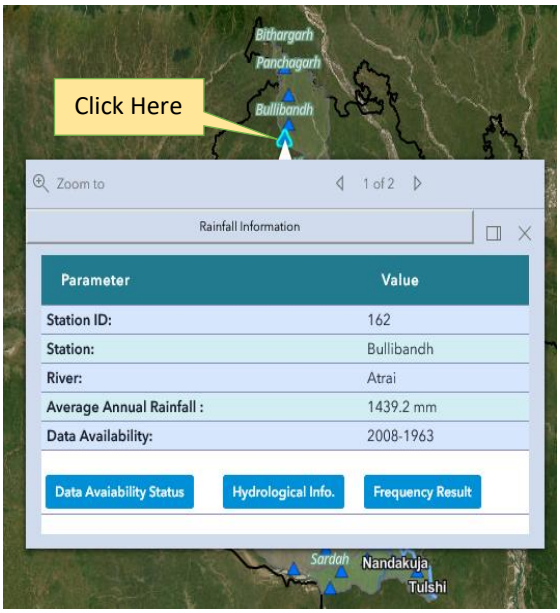


Figure 3.15: Display Rainfall Information

1.8 Data Availability of Water Level, Discharge and Rainfall from Popup Window

To view data Availability, click on 'Data Availability Status' Button and the status will be displayed in Tabular and Graph Format (Figure 3.16, 3.17).

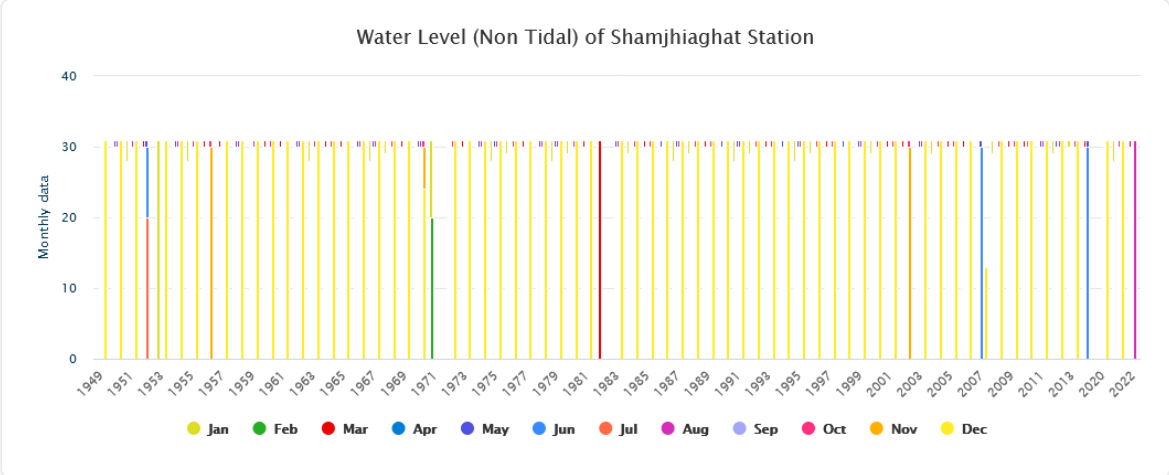


Figure 3.16: Display the status of data availability in Graph Format

Water Level (Non Tidal) of Shamjhiaghat Station												
Year	January	February	March	April	May	June	July	August	September	October	November	December
1949	0	0	0	0	0	10	31	31	30	31	30	31
1950	31	28	31	30	31	30	31	31	30	31	30	31
1951	31	28	31	30	31	30	31	31	30	31	30	31
1952	31	29	31	30	31	30	20	0	0	0	0	0
1953	31	0	0	0	0	0	0	31	30	31	30	31
1954	31	0	31	30	31	30	31	31	30	31	30	31
1955	31	28	31	30	31	30	31	31	30	31	30	31
1956	31	29	31	30	31	30	31	31	30	31	30	0
1957	31	28	31	30	31	30	31	31	30	31	30	31
1958	31	28	31	30	31	30	31	31	30	31	30	31
1959	0	0	0	30	31	30	31	31	30	31	30	31
1960	31	29	31	30	31	30	31	31	30	31	30	31
1961	31	28	31	30	31	30	31	31	30	31	30	31
1962	31	28	31	30	31	30	31	31	30	31	30	31
1963	31	28	31	30	31	30	31	31	30	31	30	31
1964	31	29	31	30	31	30	23	31	30	31	30	31
1953	31	0	0	0	0	0	0	31	30	31	30	31
1954	31	0	31	30	31	30	31	31	30	31	30	31
1955	31	28	31	30	31	30	31	31	30	31	30	31
1956	31	29	31	30	31	30	31	31	30	31	30	0
1957	31	28	31	30	31	30	31	31	30	31	30	31
1958	31	28	31	30	31	30	31	31	30	31	30	31
1959	0	0	0	30	31	30	31	31	30	31	30	31
1960	31	29	31	30	31	30	31	31	30	31	30	31

Figure 3.17: Display the status of data availability in Tabular Format

1.9 Hydrological Status of Water Level, Discharge and Rainfall from Popup Window

To view data Availability, click on 'Hydrological Status' Button and the status will be displayed in Tabular and Graph Format (Figure 3.18, 3.19).

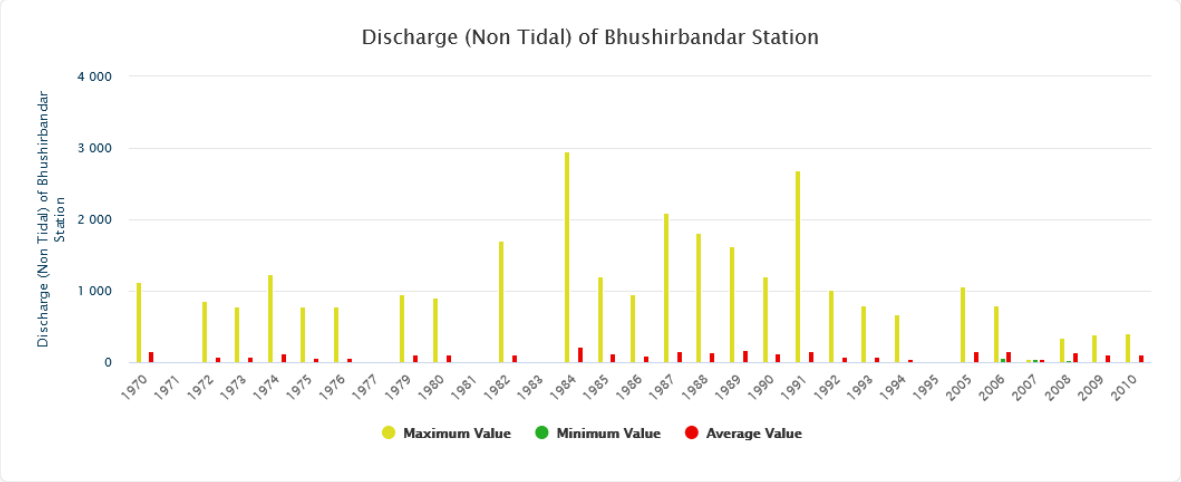


Figure 3.18: Display Hydrological Status in Graph Format

Discharge (Non Tidal) of Bhushirbandar Station					
Station	Year	Maximum Value	Minimum Value	Average Value	Sum
142.1	1970	1120	14.2	148.45714285714286	54038.4
142.1	1971	20.9	12.7	17.420454545454547	766.5
142.1	1972	852	8.91	80.19167272727273	22052.71
142.1	1973	784	6.23	80.6617808219178	29441.55
142.1	1974	1230	8.07	123.03583561643836	44908.08
142.1	1975	787	3.11	70.15435616438356	25606.34
142.1	1976	778	8.72	65.14968208092486	22541.79
142.1	1977	8.01	6.08	6.913636363636364	380.25
142.1	1979	948	3.93	104.21729411764706	26575.41
142.1	1980	908	11.2	107.44518828451884	25679.4
142.1	1981	17.9	8.18	12.790666666666667	1151.16
142.1	1982	1710	10.2	110.45037313432836	29600.7
142.1	1970	1120	14.2	148.45714285714286	54038.4
142.1	1971	20.9	12.7	17.420454545454547	766.5
142.1	1970	1120	14.2	148.45714285714286	54038.4
142.1	1971	20.9	12.7	17.420454545454547	766.5
142.1	1972	852	8.91	80.19167272727273	22052.71
142.1	1973	784	6.23	80.6617808219178	29441.55
142.1	1974	1230	8.07	123.03583561643836	44908.08
142.1	1975	787	3.11	70.15435616438356	25606.34
142.1	1976	778	8.72	65.14968208092486	22541.79
142.1	1977	8.01	6.08	6.913636363636364	380.25
142.1	1979	948	3.93	104.21729411764706	26575.41
142.1	1980	908	11.2	107.44518828451884	25679.4
142.1	1981	17.9	8.18	12.790666666666667	1151.16
142.1	1982	1710	10.2	110.45037313432836	29600.7
142.1	1983	19.3	10.1	14.766666666666667	1329
142.1	1984	2950	9.49	211.8992337164751	55305.7
142.1	1985	1210	12.9	124.32	39160.8
142.1	1986	948	11.6	100.38304498269896	29010.7
142.1	1987	2090	11.2	160.28438356164384	58503.8
142.1	1988	1820	13.1	134.39441340782122	48113.2

Figure 3.19: Display Hydrological Status in Tabular Format

1.10 Frequency Analysis of Water Level, Discharge and Rainfall from Popup Window

To view the result of frequency analysis, click on 'Frequency Result' Button and the status will be displayed in Tabular (Figure 3.20, 3.21).

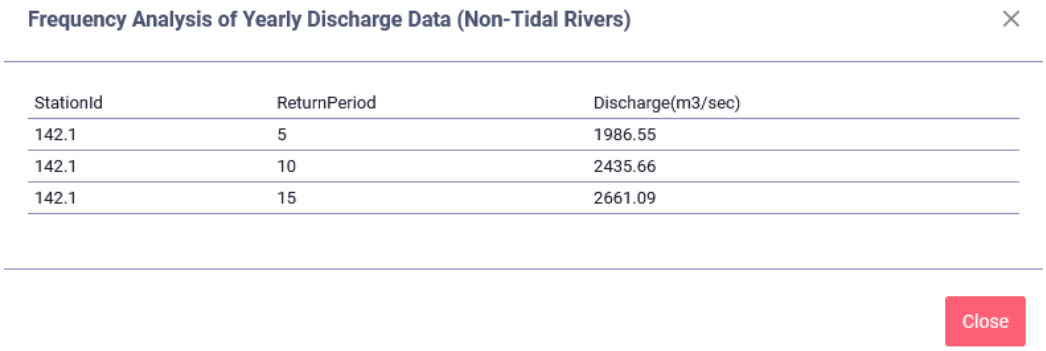


Figure 3.20: Display result of frequency in Tabular Format

1.11 Frequency Analysis of Water Level, Discharge and Rainfall from Data Layer Panel

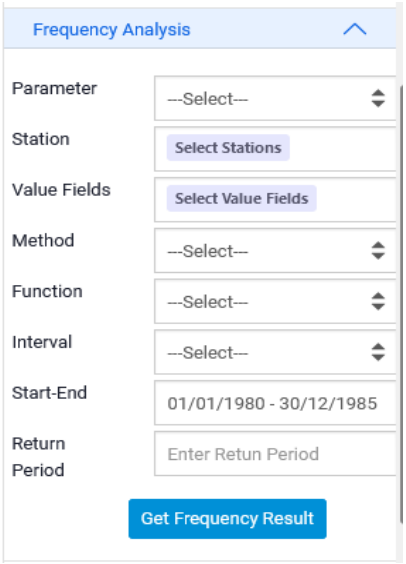


Figure 3.21: Selection Panel of Frequency Analysis

After clicking the *'Get Frequency Result'* Button, Frequency Result will be displayed.

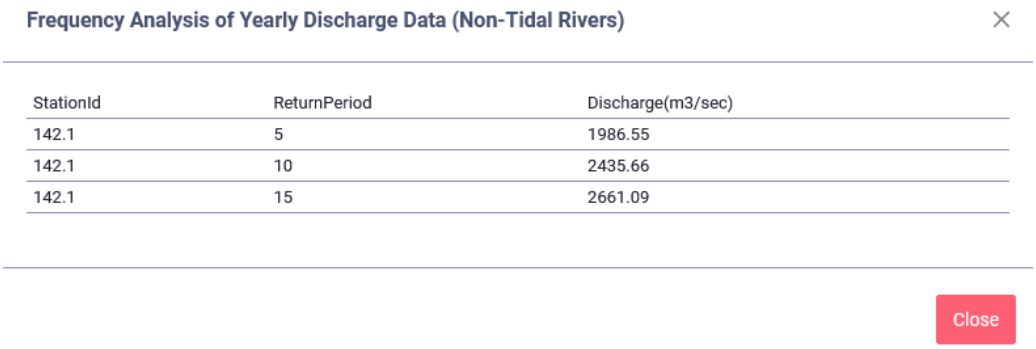


Figure 3.22: Display result of Frequency Analysis

1.12 Hydrological Status of Water Level, Discharge and Rainfall from Data Layer Panel

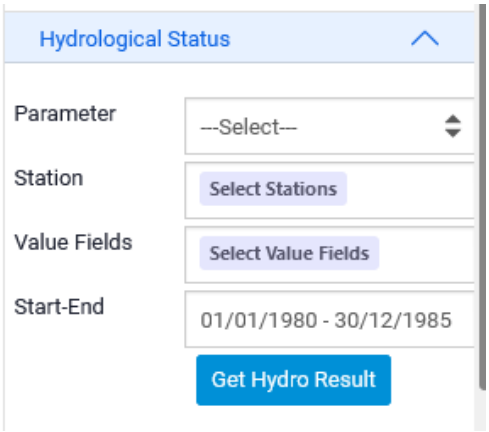


Figure 3.23: Selection Panel of Hydrological Status

After clicking the *'Get Hydro Result'* Button, Hydrological Status will be displayed in Tabular and Graph (Figure 3.23).

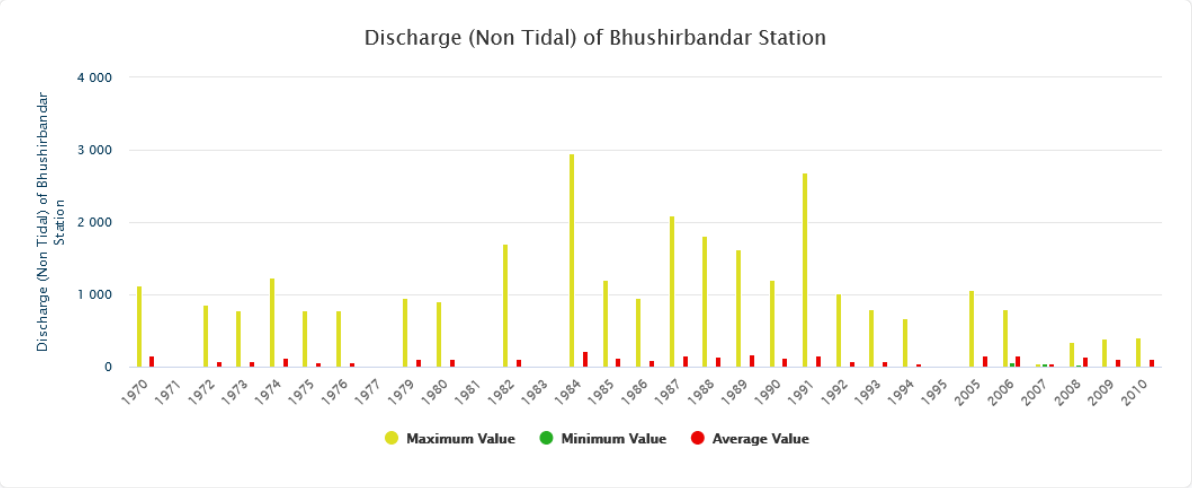


Figure 3.23: Display Hydrological Status in Tabular Format from data Layer Panel

Discharge (Non Tidal) of Bhushirbandar Station					
Station	Year	Maximum Value	Minimum Value	Average Value	Sum
142.1	1970	1120	14.2	148.45714285714286	54038.4
142.1	1971	20.9	12.7	17.420454545454547	766.5
142.1	1972	852	8.91	80.19167272727273	22052.71
142.1	1973	784	6.23	80.6617808219178	29441.55
142.1	1974	1230	8.07	123.03583561643836	44908.08
142.1	1975	787	3.11	70.15435616438356	25606.34
142.1	1976	778	8.72	65.14968208092486	22541.79
142.1	1977	8.01	6.08	6.913636363636364	380.25
142.1	1979	948	3.93	104.21729411764706	26575.41
142.1	1980	908	11.2	107.44518828451884	25679.4
142.1	1981	17.9	8.18	12.790666666666667	1151.16
142.1	1982	1710	10.2	110.45037313432836	29600.7
142.1	1970	1120	14.2	148.45714285714286	54038.4
142.1	1971	20.9	12.7	17.420454545454547	766.5
142.1	1970	1120	14.2	148.45714285714286	54038.4
142.1	1971	20.9	12.7	17.420454545454547	766.5
142.1	1972	852	8.91	80.19167272727273	22052.71
142.1	1973	784	6.23	80.6617808219178	29441.55
142.1	1974	1230	8.07	123.03583561643836	44908.08
142.1	1975	787	3.11	70.15435616438356	25606.34
142.1	1976	778	8.72	65.14968208092486	22541.79
142.1	1977	8.01	6.08	6.913636363636364	380.25
142.1	1979	948	3.93	104.21729411764706	26575.41
142.1	1980	908	11.2	107.44518828451884	25679.4
142.1	1981	17.9	8.18	12.790666666666667	1151.16
142.1	1982	1710	10.2	110.45037313432836	29600.7
142.1	1983	19.3	10.1	14.766666666666667	1329
142.1	1984	2950	9.49	211.8992337164751	55305.7
142.1	1985	1210	12.9	124.32	39160.8
142.1	1986	948	11.6	100.38304498269896	29010.7
142.1	1987	2090	11.2	160.28438356164384	58503.8
142.1	1988	1820	13.1	134.39441340782122	48113.2

Figure 3.24: Display Hydrological Status in Tabular Format from data Layer Panel

1.13 Data Availability of Water Level, Discharge and Rainfall from Data Layer Panel

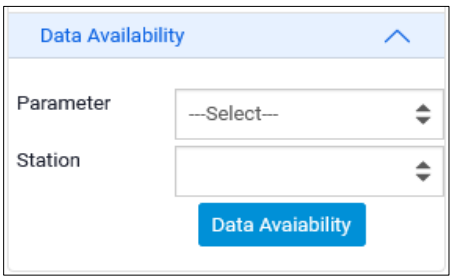


Figure 3.25: Selection Panel of Data Availability

After clicking the ‘Data Availability’ Button, data availability will be displayed

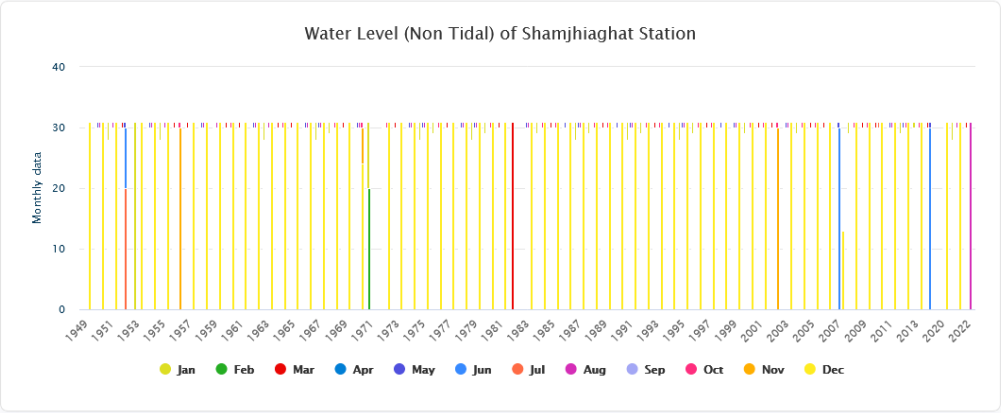


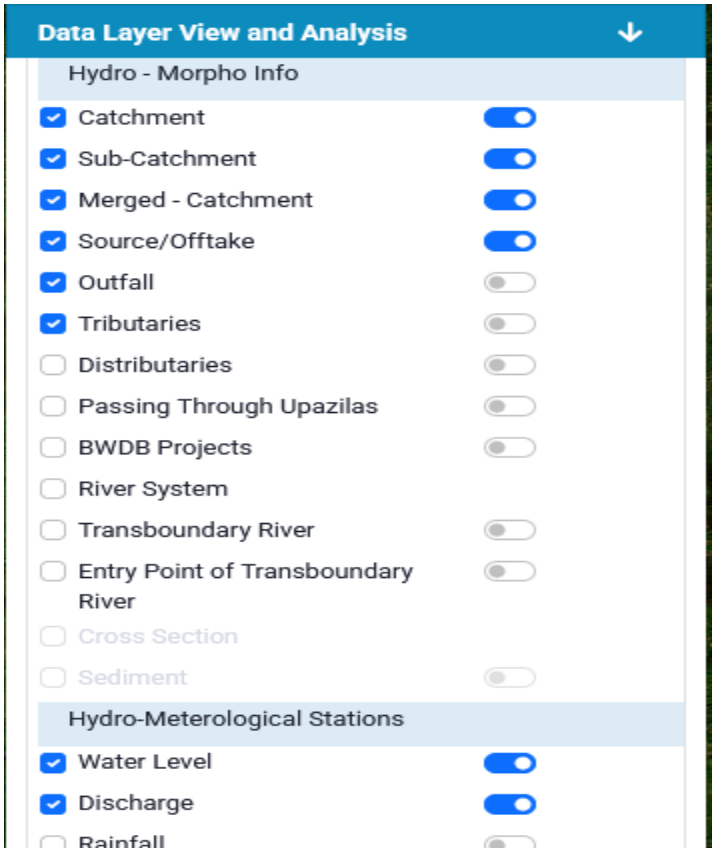
Figure 3.26: Display the status of data availability in Graph Format

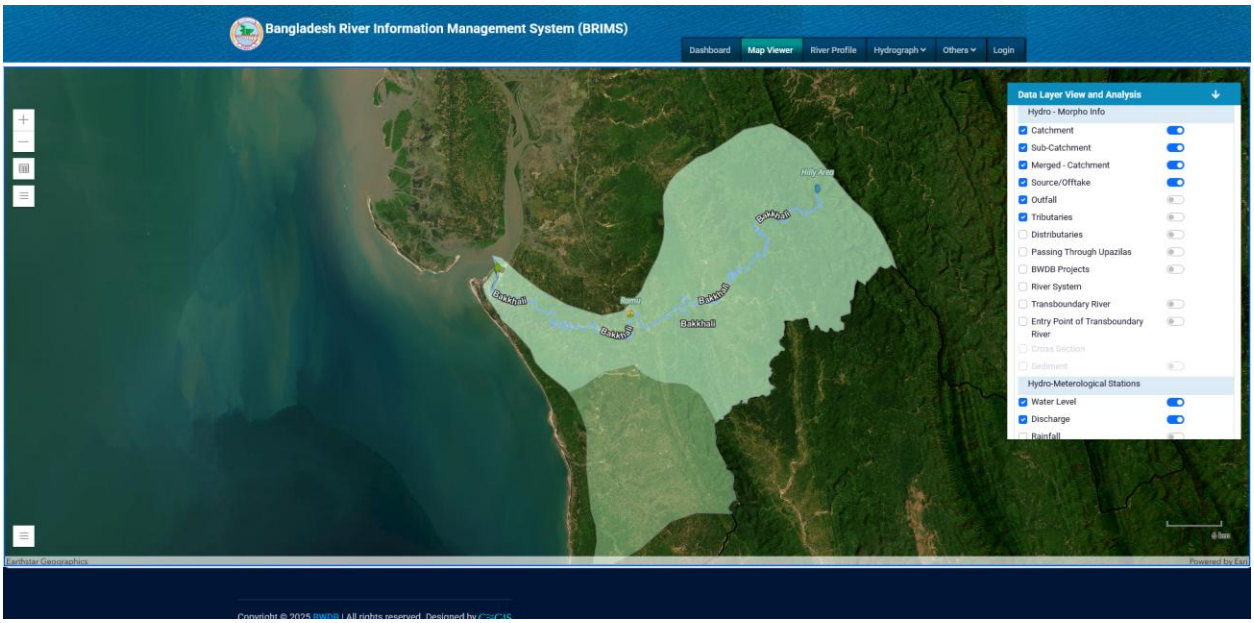
Water Level (Non Tidal) of Shamjhiaghat Station												
Year	January	February	March	April	May	June	July	August	September	October	November	December
1949	0	0	0	0	0	10	31	31	30	31	30	31
1950	31	28	31	30	31	30	31	31	30	31	30	31
1951	31	28	31	30	31	30	31	31	30	31	30	31
1952	31	29	31	30	31	30	20	0	0	0	0	0
1953	31	0	0	0	0	0	0	31	30	31	30	31
1954	31	0	31	30	31	30	31	31	30	31	30	31
1955	31	28	31	30	31	30	31	31	30	31	30	31
1956	31	29	31	30	31	30	31	31	30	31	30	0
1957	31	28	31	30	31	30	31	31	30	31	30	31
1958	31	28	31	30	31	30	31	31	30	31	30	31
1959	0	0	0	30	31	30	31	31	30	31	30	31
1960	31	29	31	30	31	30	31	31	30	31	30	31
1961	31	28	31	30	31	30	31	31	30	31	30	31
1962	31	28	31	30	31	30	31	31	30	31	30	31
1963	31	28	31	30	31	30	31	31	30	31	30	31
1964	31	29	31	30	31	30	23	31	30	31	30	31
1953	31	0	0	0	0	0	0	31	30	31	30	31
1954	31	0	31	30	31	30	31	31	30	31	30	31
1955	31	28	31	30	31	30	31	31	30	31	30	31
1956	31	29	31	30	31	30	31	31	30	31	30	0
1957	31	28	31	30	31	30	31	31	30	31	30	31
1958	31	28	31	30	31	30	31	31	30	31	30	31
1959	0	0	0	30	31	30	31	31	30	31	30	31
1960	31	29	31	30	31	30	31	31	30	31	30	31

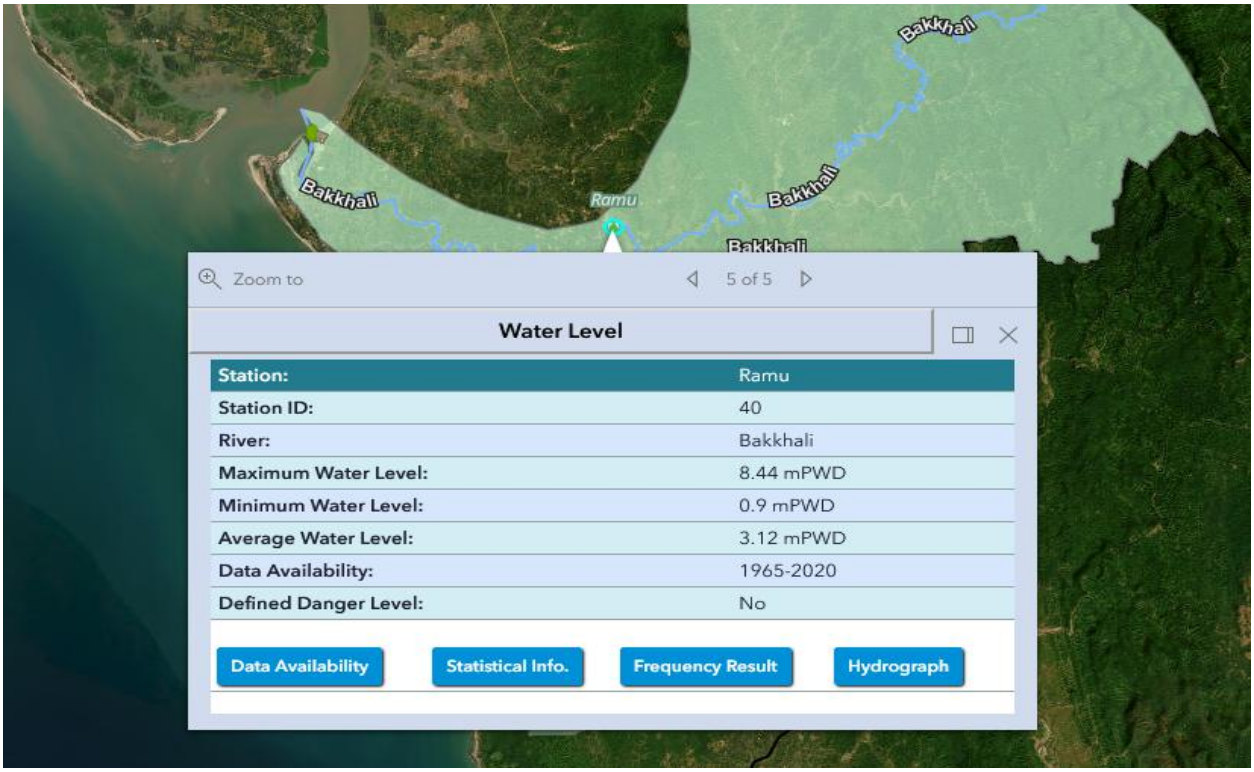
Figure 3.27: Display the status of data availability in Tabular Format

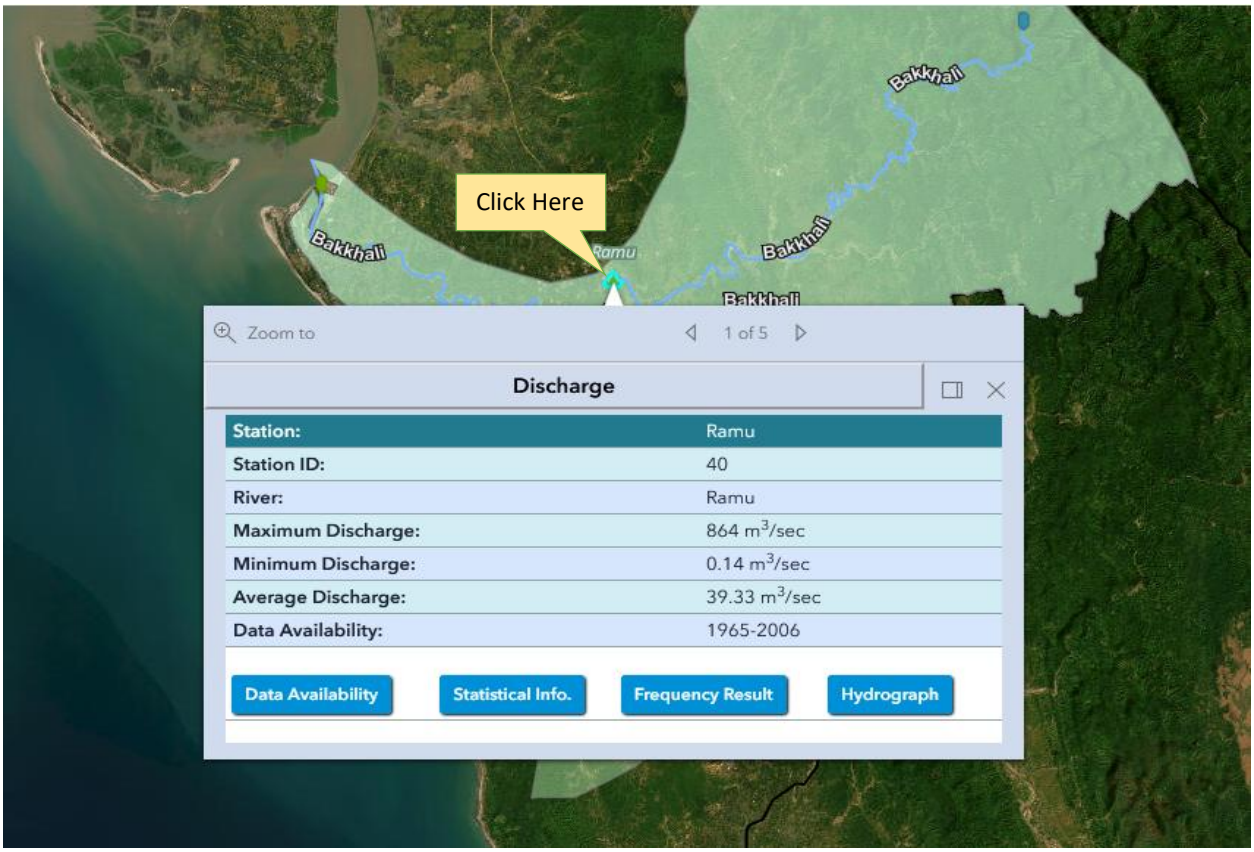
1.14 Summary Information

Check on catchment, Water Level , Discharge and other parameters to view summary information.


Data Layer View and Analysis
Hydro - Morpho Info
Catchment
Sub-Catchment
Merged - Catchment
Source/Offtake
Outfall
Tributaries
Distributaries
Passing Through Upazilas
BWDB Projects
River System
Transboundary River
Entry Point of Transboundary River
Cross Section
Sediment
Hydro-Meterological Stations
Water Level
Discharge
Rainfall


Bangladesh River Information Management System (BRIMS)
Dashboard
Map Viewer
River Profile
Hydrograph
Others
Login
Data Layer View and Analysis
Hydro - Morpho Info
Catchment
Sub-Catchment
Merged - Catchment
Source/Offtake
Outfall
Tributaries
Distributaries
Passing Through Upazilas
BWDB Projects
River System
Transboundary River
Entry Point of Transboundary River
Cross Section
Sediment
Hydro-Meterological Stations
Water Level
Discharge
Rainfall
Bakkhali
Earthstar Geographics


Bakkhali
Bakkhali
Ramu
Bakkhali
Bakkhali
Zoom to
5 of 5
Water Level
Station: Ramu
Station ID: 40
River: Bakkhali
Maximum Water Level: 8.44 mPWD
Minimum Water Level: 0.9 mPWD
Average Water Level: 3.12 mPWD
Data Availability: 1965-2020
Defined Danger Level: No
Data Availability
Statistical Info.
Frequency Result
Hydrograph


Click Here
Bakkhali
Bakkhali
Ramu
Bakkhali
Bakkhali
Zoom to
1 of 5
Discharge
Station: Ramu
Station ID: 40
River: Ramu
Maximum Discharge: 864 m3/sec
Minimum Discharge: 0.14 m3/sec
Average Discharge: 39.33 m3/sec
Data Availability: 1965-2006
Data Availability
Statistical Info.
Frequency Result
Hydrograph

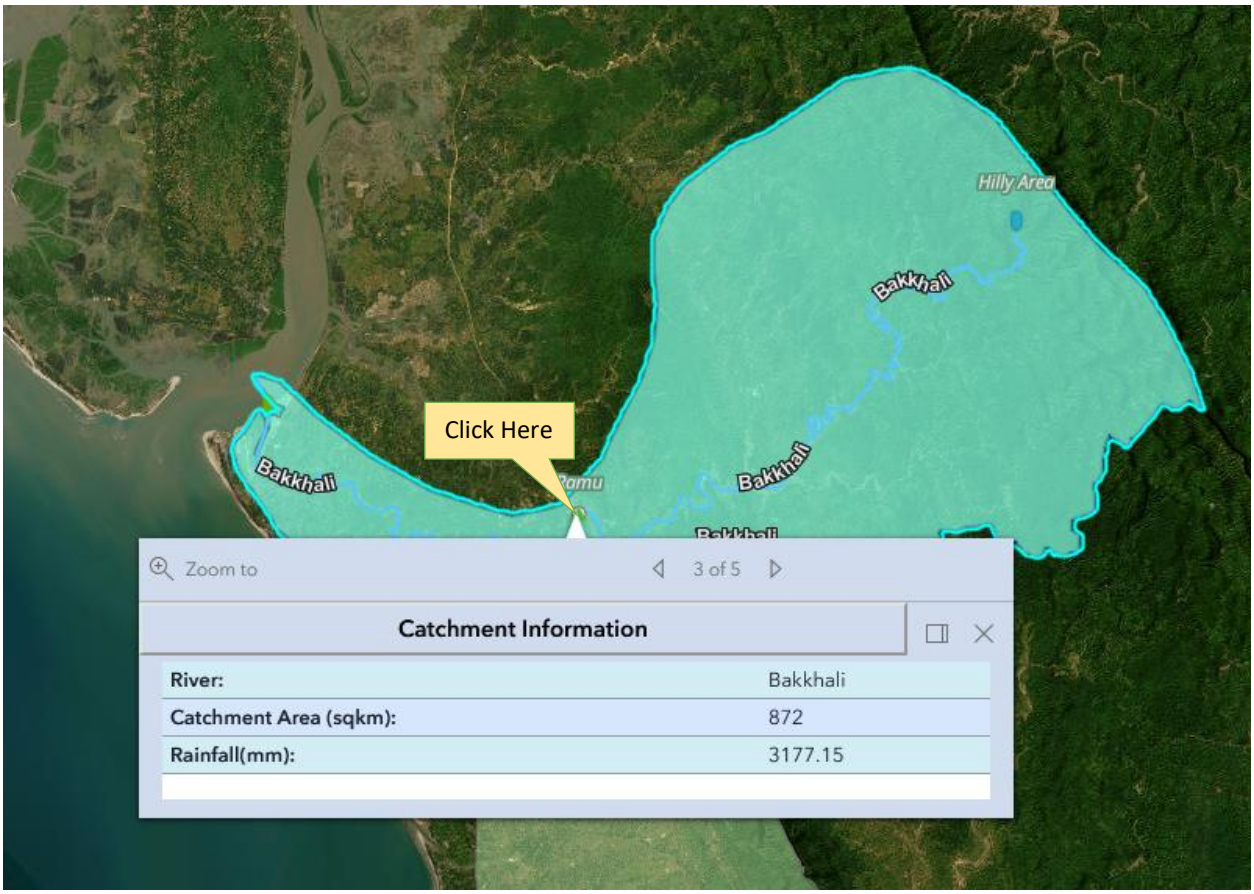


Figure 3.28: Display Summary Information

1.15 Backend Layer

Users can be able to change the backend layer in the Map Window.

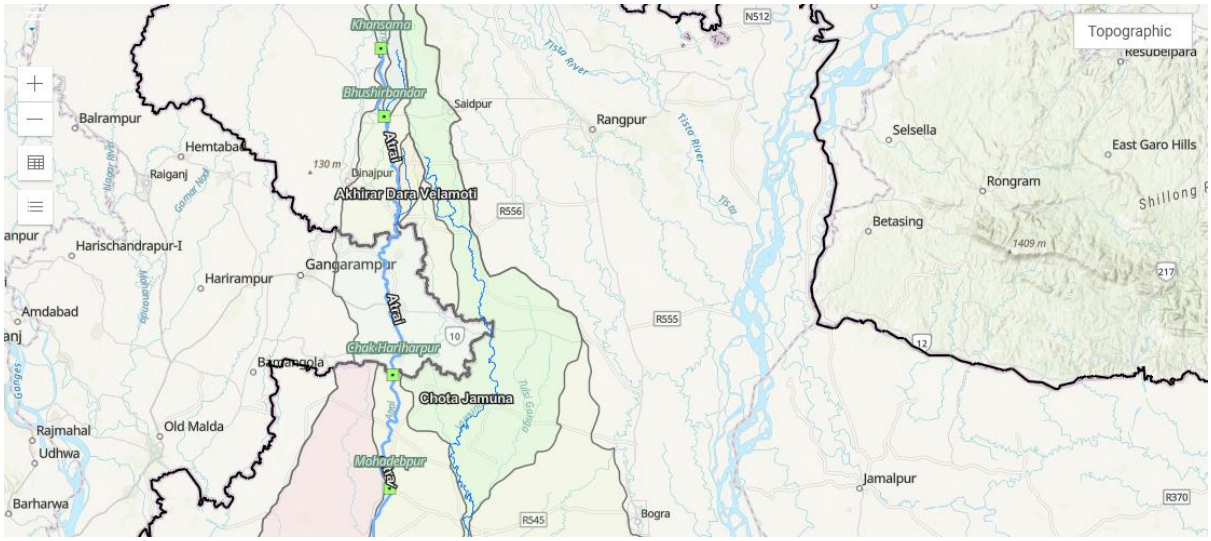


Figure 3.29: Backend Layer

2. River Profile

In this module, users can search and view rivers information by Hydrological Region, river name or river ID. User can also Add/Update/Delete River information in this module. To search and view river information, ***select*** the **River Profile** menu option**,** it will open the river profile page**.** (Figure 4.1).

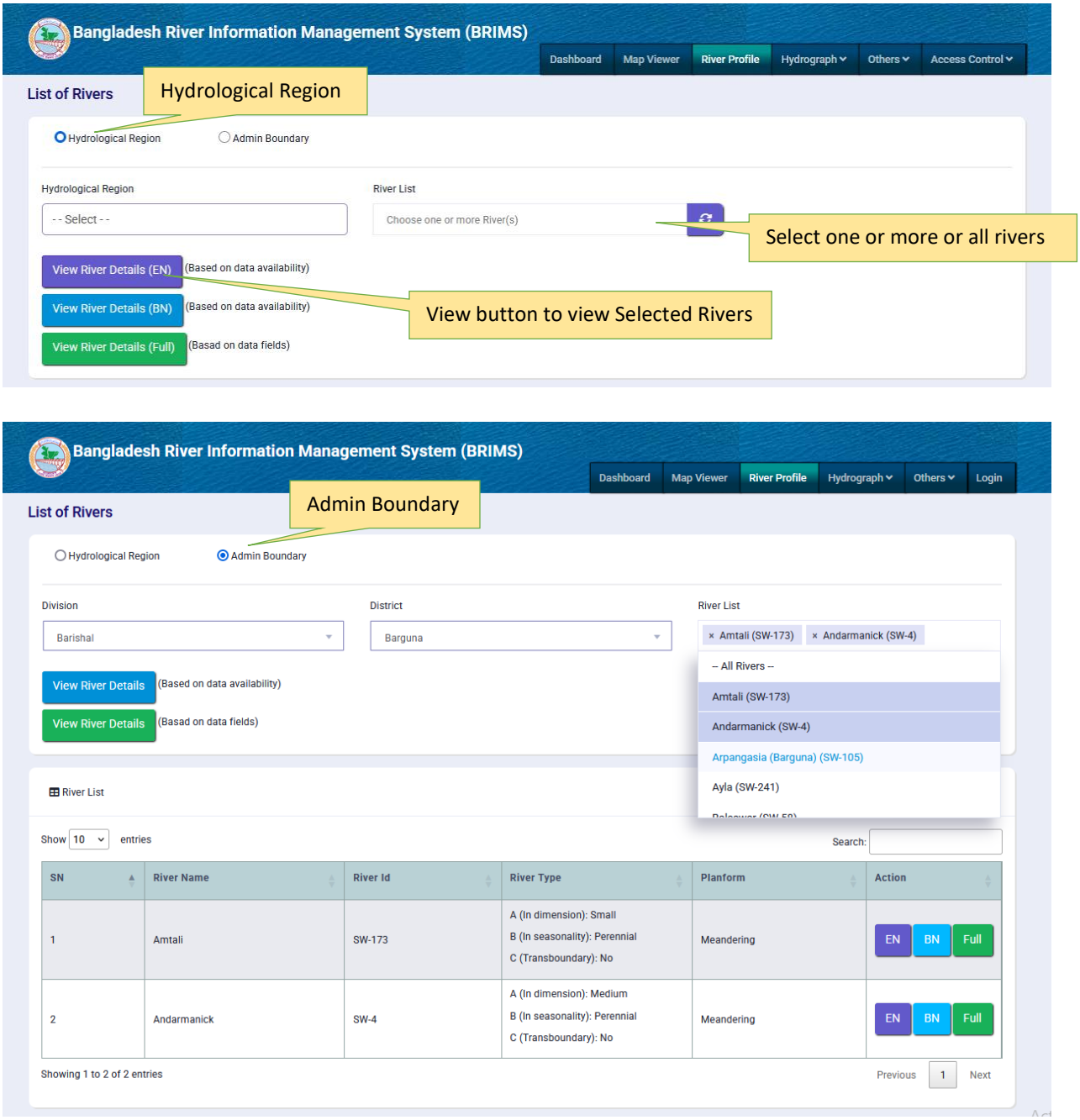


Figure 4.1: Add/Update Inspection Information

2.1 Steps of Searching and selection of rivers

To search and view the river list or individual details, ***click*** on the Hydrological Region, then ***select*** a Region. A list of rivers will be loaded to the River list.
Then ***select*** one or more or all rivers from river list of the selected region (Figure 4.2)**.**

2.2 Searching Results or Selected Rivers Information Report

2.2.1 Searching Results

A data table will load below as search result with selected River list information. In every row there are two buttons at the right side (Figure 4.3).

(a) Edit Button
(b) View Button

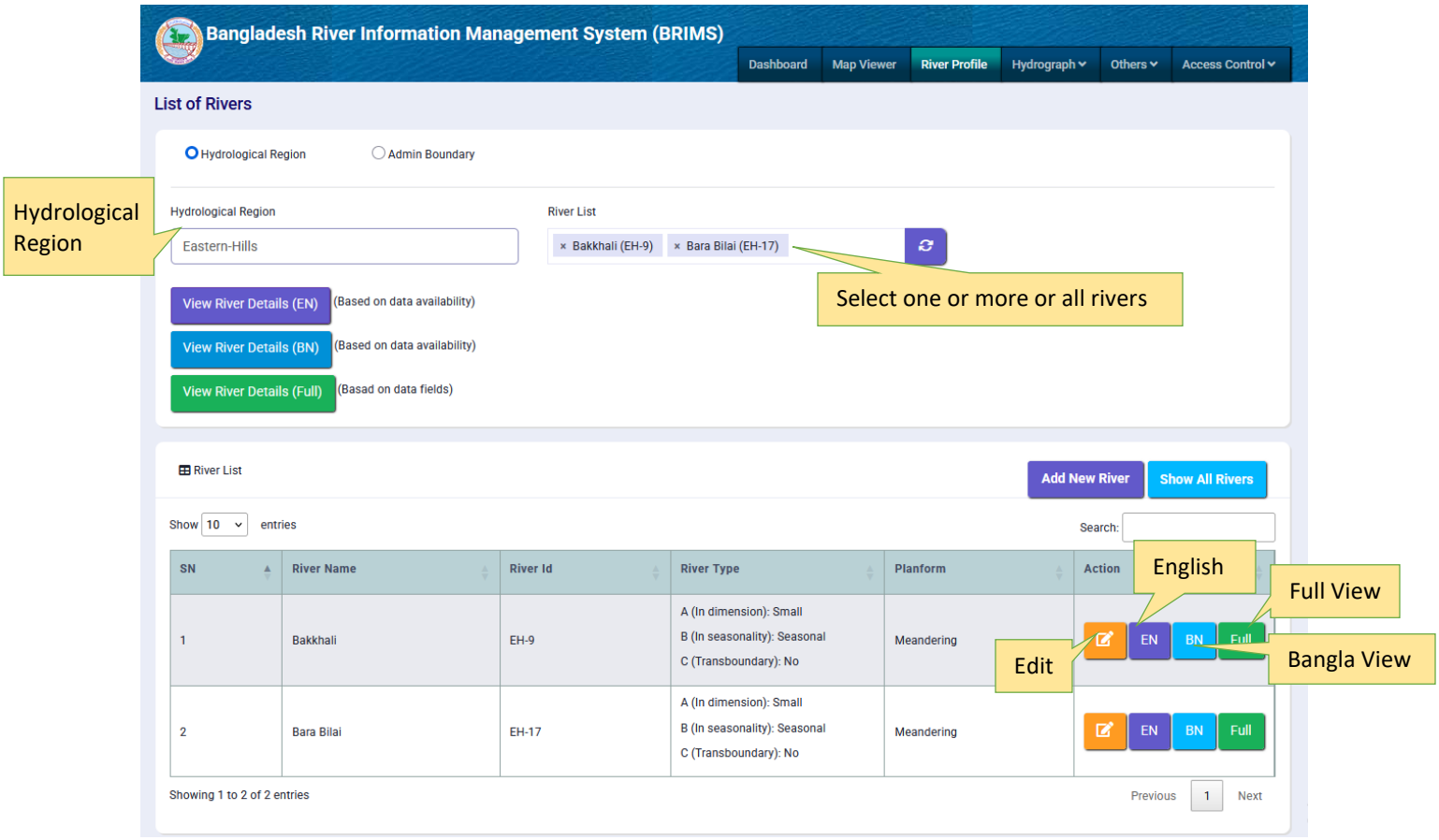


Figure 4.2: Searching and selection of rivers

(a) Edit Button

To edit/update river information click on the edit button. A new page will open with the river information in 6 tabs (Figure 4.4).

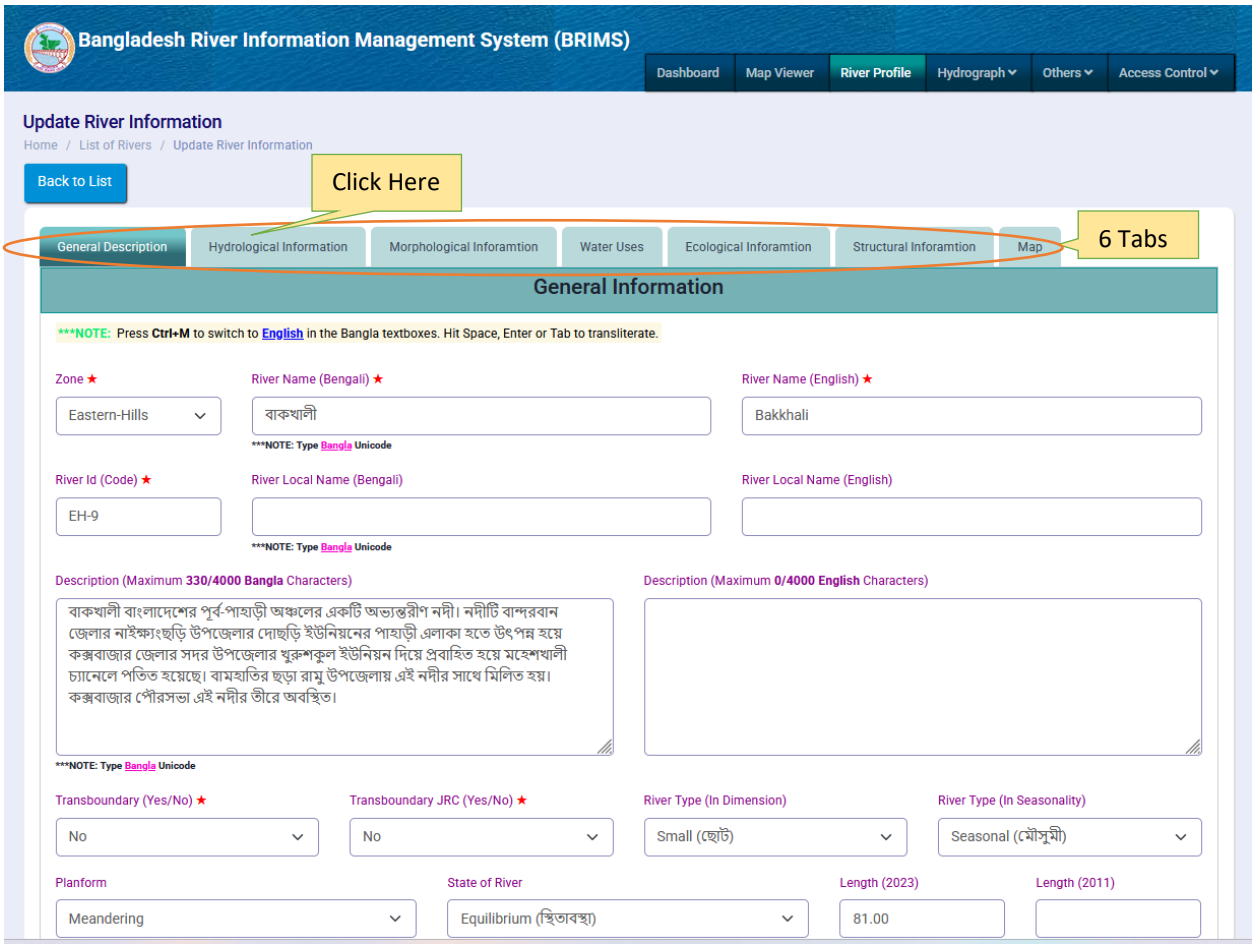
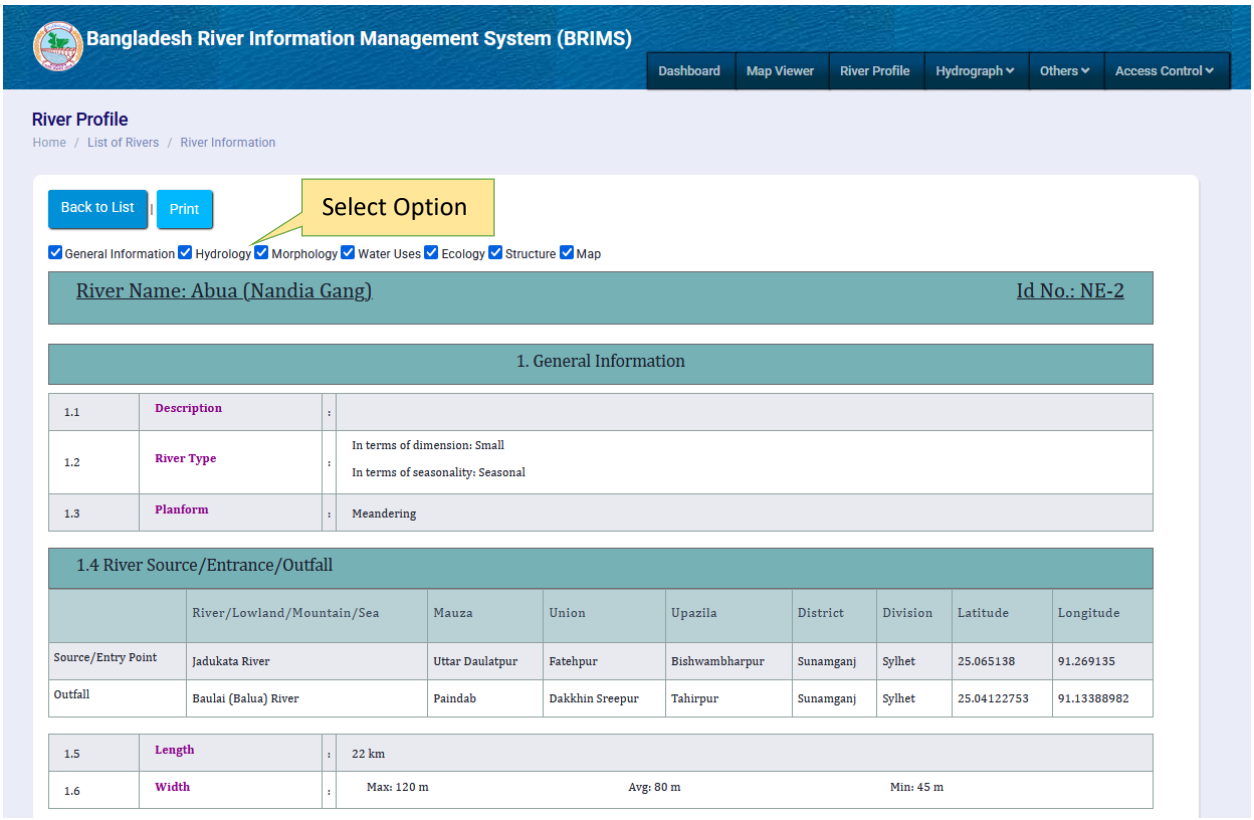


Figure 4.4: Edit Data

(b) View(EN version)

To view the selected river information click on the View button from the data table. A new page will open with the river information in **view mode** (Figure 4.5)


Bangladesh River Information Management System (BRIMS)
Dashboard
Map Viewer
River Profile
Hydrograph
Others
Access Control
River Profile
Home / List of Rivers / River Information
Back to List
Print
Select Option
General Information
Hydrology
Morphology
Water Uses
Ecology
Structure
Map
River Name: Abua (Nandia Gang)
Id No.: NE-2
1. General Information
1.1 Description :
1.2 River Type : In terms of dimension: Small
In terms of seasonality: Seasonal
1.3 Planform : Meandering
1.4 River Source/Entrance/Outfall
River/Lowland/Mountain/Sea
Mauza
Union
Upazila
District
Division
Latitude
Longitude
Source/Entry Point
Jadukata River
Uttar Daulatpur
Fatehpur
Bishwambharpur
Sunamganj
Sylhet
25.065138
91.269135
Outfall
Baulai (Balua) River
Paindab
Dakkhin Sreepur
Tahirpur
Sunamganj
Sylhet
25.04122753
91.13388982
1.5 Length : 22 km
1.6 Width : Max: 120 m Avg: 80 m Min: 45 m

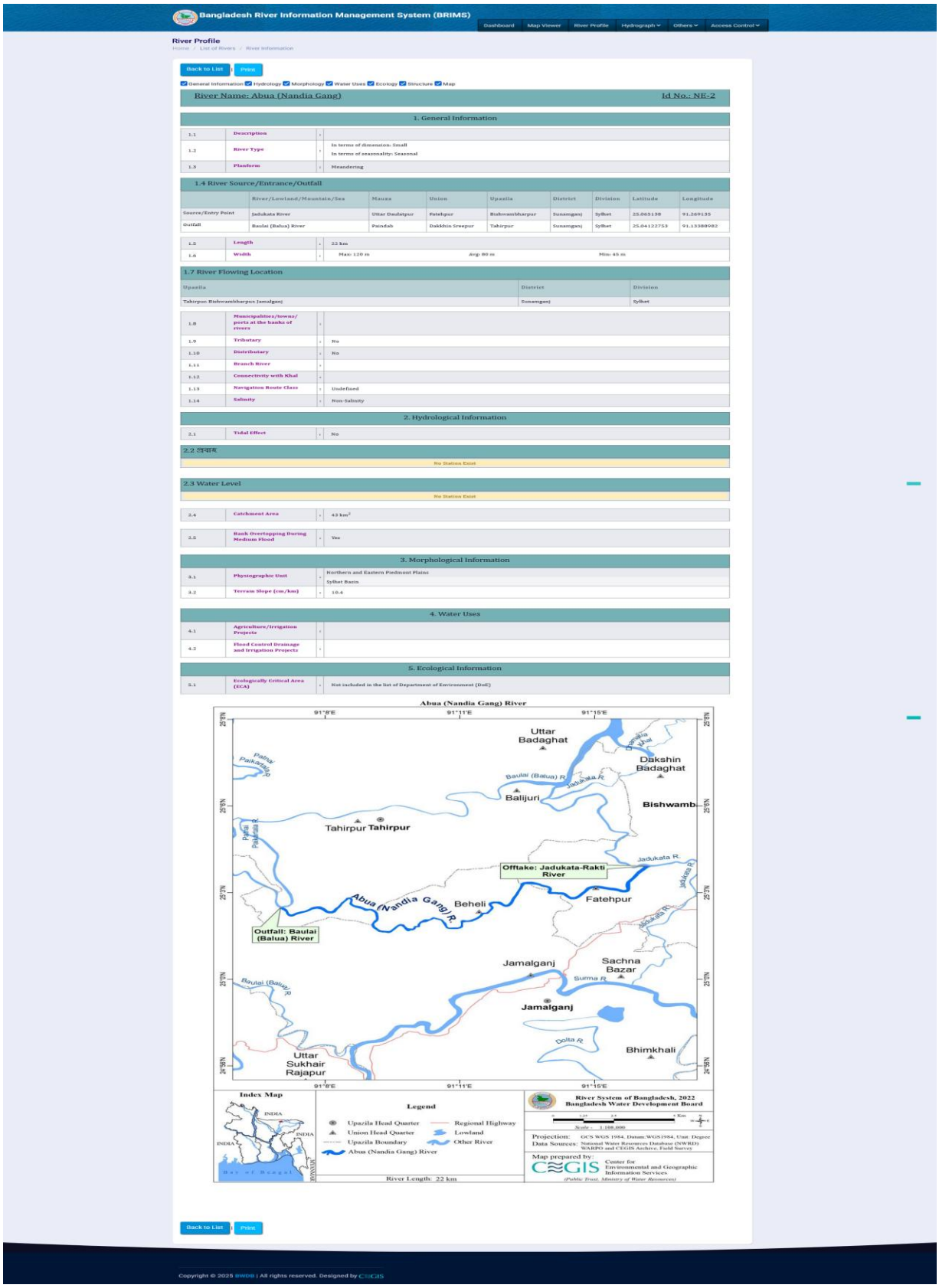


Figure 4.5: View Data

2.2.2 Selected Rivers Information Report

Now, If the user click on the **View Selected River Details** button a new page will load with selected river information as a printable report (Figure 4.6). This report will contain all the selected rivers information one after the another (Figure 4.6).

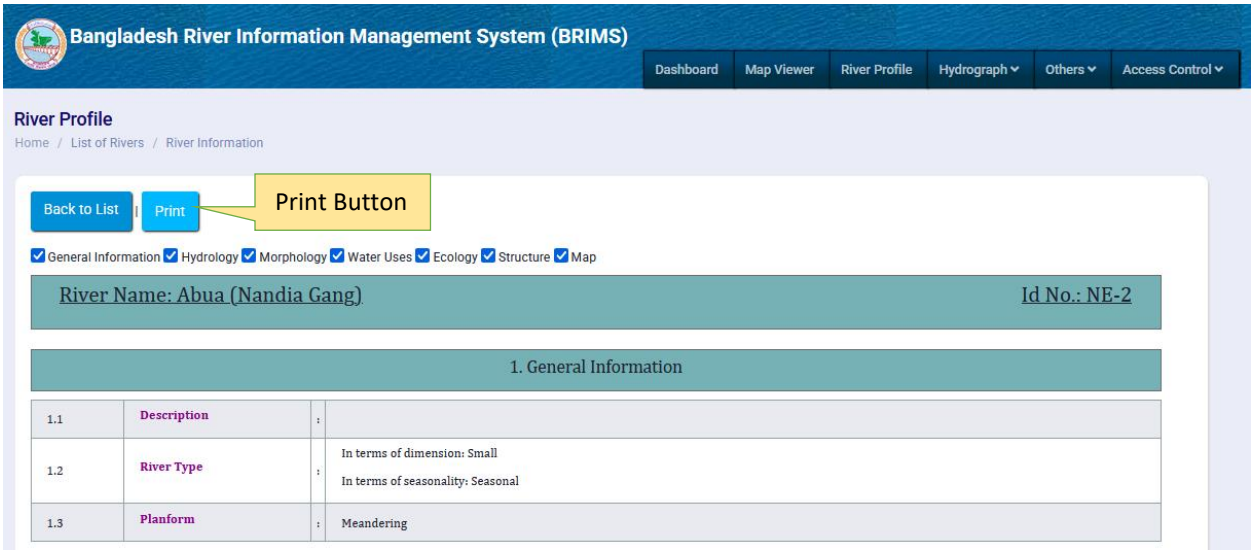


Figure 4.6: River Information

Then click on the Print button to print the report (Figure 4.7).

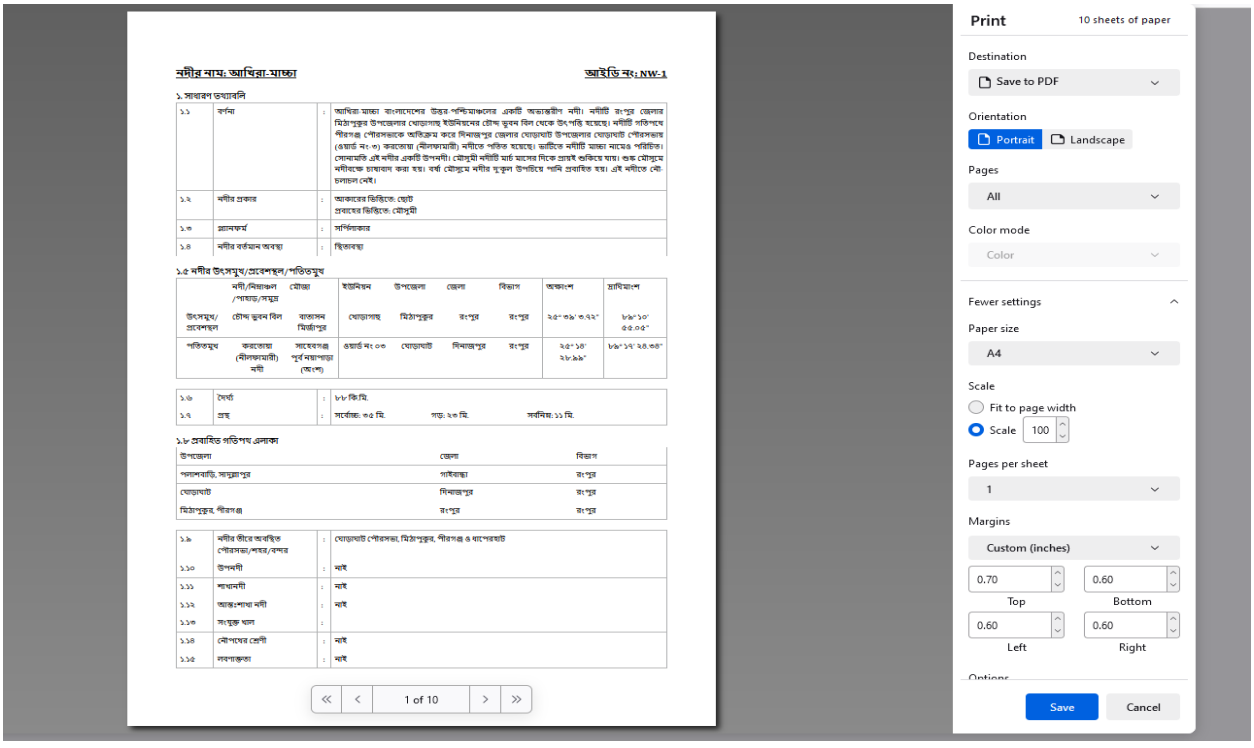
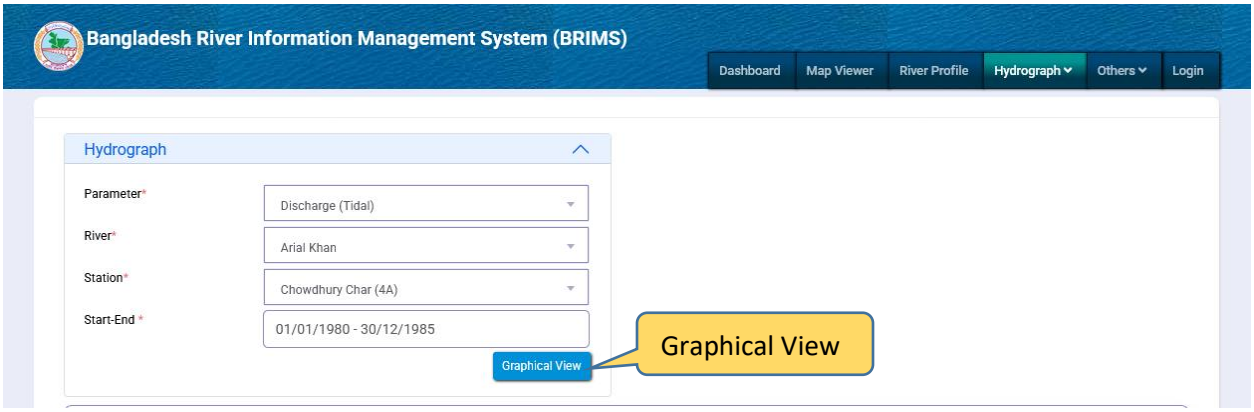


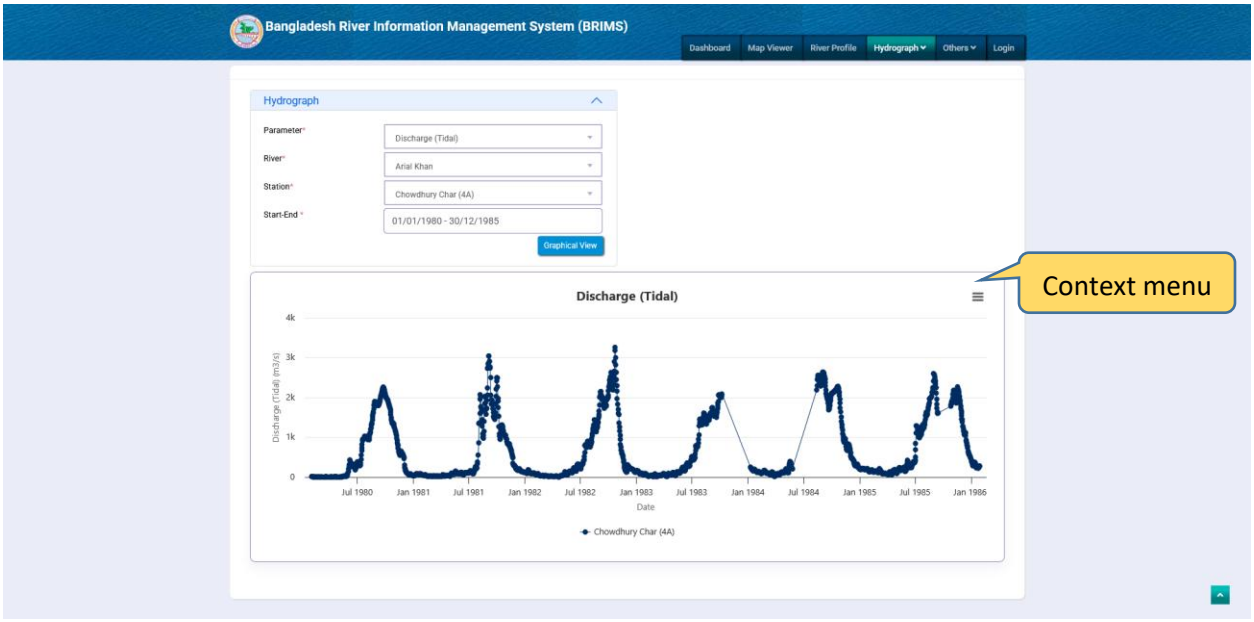
Figure 4.7: Print River Information Report

3. Hydrograph

- Click on the **Hydrograph** tab.
- Here is two option **Hydrograph** and **Hydrograph API**
- Enter the required inputs:
  1. **Parameter***: Select the type of data you want to analyze.
  2. **River***: Choose the river for which you want to generate the graph.
  3. **Station***: Select the monitoring station.
  4. **Start-End***: Specify the date range for the data.

- Click the **Graphical View** button to create the graph based on the input.
- Here also a Context Menu icon for download the graph.





4. User Manual

To view the user manual ***Click*** on **User Manual** option from the Menu list at the left panel. The user manual will be open as a pdf file, so that user can read or download it anytime (Figure 5.1).

Figure 5.1: User Manual

5. Video Tutorial

A video tutorial has also been uploaded for users to easy uderstanding. To open the video ***click*** on the **Video Tutorial** option from the Menu list at the left panel (Figure 6.1).

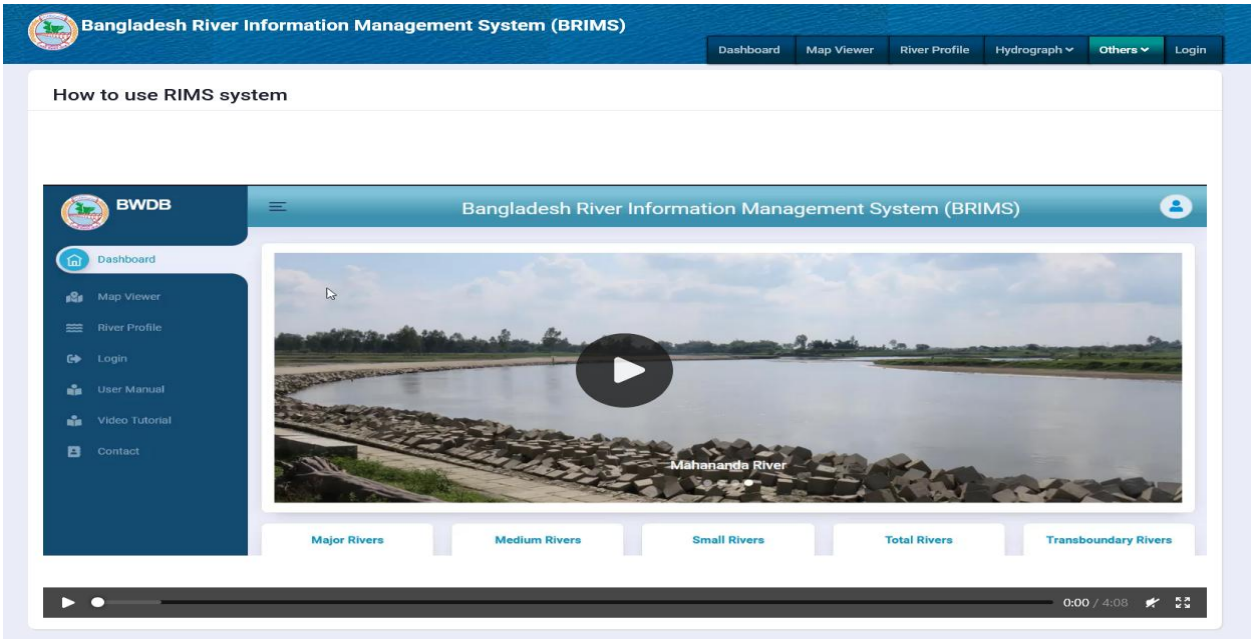


Figure 6.1: Video Tutorial

6. Access Controls

In this module, an Admin user can access any restricted options such as, deleting some records, any major changes, adding new users, manage users, replying feedbacks and so on. There are five major activities of an Administator. These are:

a) User Registration
b) Manage Users
c) Change Password

6.1 User Registration

The Administrator has the power to create new users whenever required. To open the page, ***goto*** the **Access Control** menu then ***click*** on **Register** (Figure 7.1).

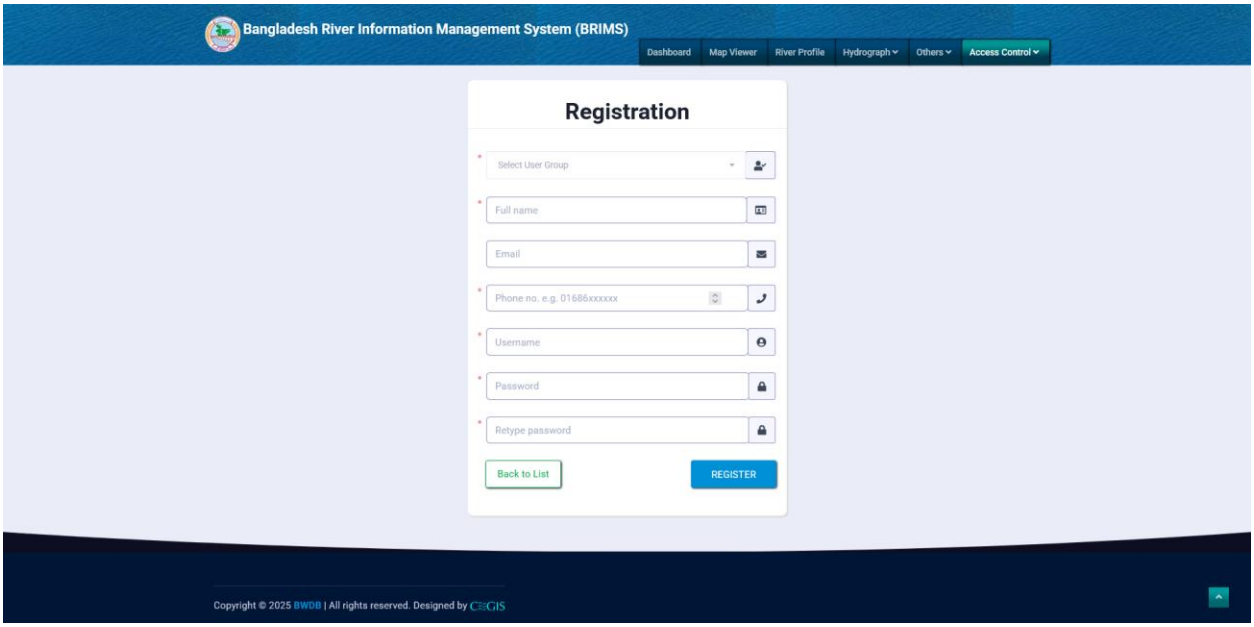


Figure 7.1: User Registration

6.2 Manage Users

Administrator can manage any registered users when required. ***Select*** an **User ID** from the drop down list. All information will be loaded automatically. Then ***update*** user **information** such as: changing user level, Designation, Contact Number, Activ Status etc (Figure 7.2).

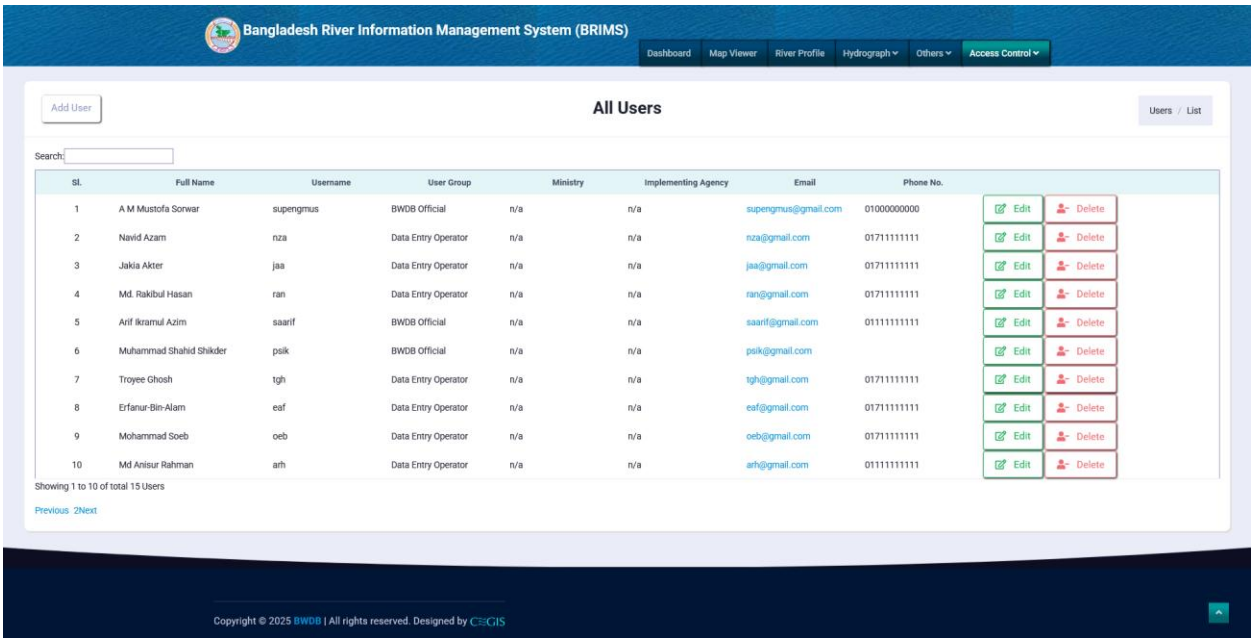
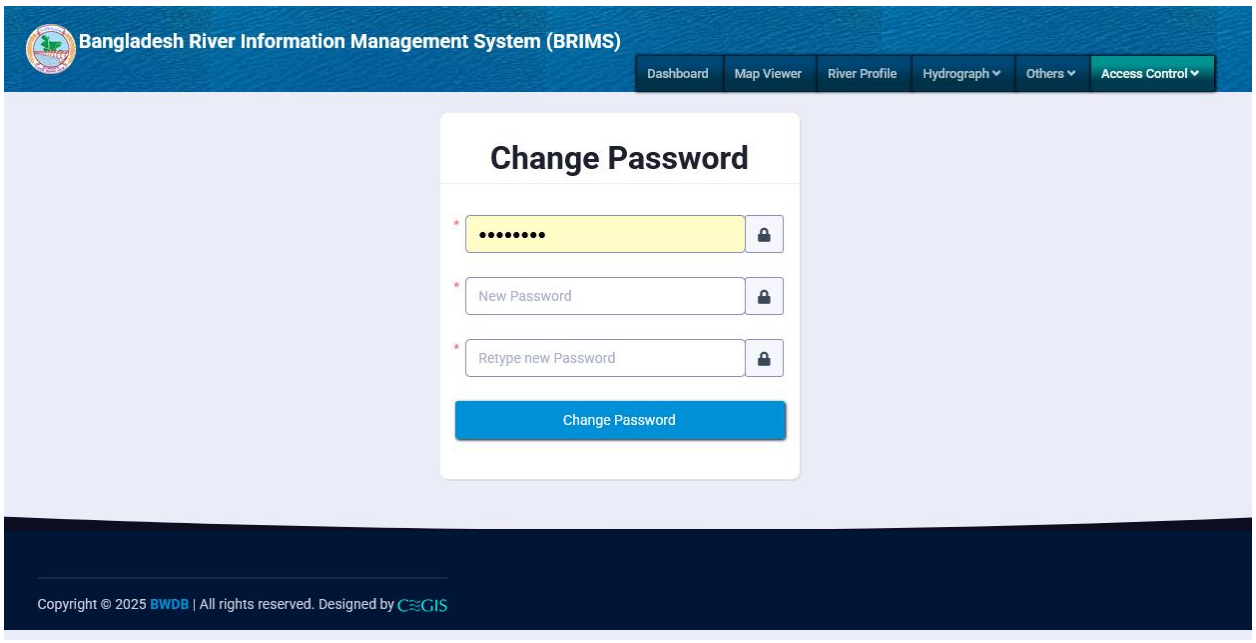


Figure 7.2: Manage Users

6.3 Change Password



--- Thank you ---