



USER MANUAL ON BANGLADESH RIVER INFORMATION MANAGEMENT SYSTEM (BRIMS)

Bangladesh River Information Management System (BRIMS)

Dashboard | Map Viewer | River Profile | Hydrograph | Tools | Help | Login

River extraction from Sentinel-2 Imagery

Operational Definition of River

A river is generally a natural watercourse that runs perennially or seasonally from definite sources (e.g. hills, rivers, waterbodies), with defined banks, contributes to the water and sediment budget of the basin/catchment, and discharges into an outfall (e.g. rivers, waterbodies, Bay of Bengal). A socially and historically recognized watercourse will also be considered as a river.

Category	Count
Major Rivers	5
Medium Rivers	92
Small Rivers	1318
Total Rivers	1415
Transboundary Rivers	57

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 aims to facilitate efficient management and decision-making regarding Bangladesh's river systems. It is a centralized platform for accessing and analyzing river-related data for various stakeholders, including government agencies, researchers, and policymakers. BRIMS integrates diverse river-related datasets, including hydrological, ecological, and socio-economic data. Data sources may include satellite imagery, remote sensing data, ground-based measurements, and government databases. BRIMS provides 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 provides essential tools for river management, offering integrated data, mapping, analysis, and decision support 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 Layer
- Web server
- Application server
- Data server

- ***Presentation Layer***

The presentation layer includes the user interfaces that users interact with within the application. This layer was created using ASP .Net and utilizes HTML5 and CSS3 with jQuery for the user interface development. The design of the interfaces prioritizes simplicity and user-friendliness.

- ***Web server***

The key service component of a web-based application is the web server. This program manages and delivers web pages and enables users to communicate with the server for data service via the Internet or an intranet. The web server is configured using Internet Information Services.

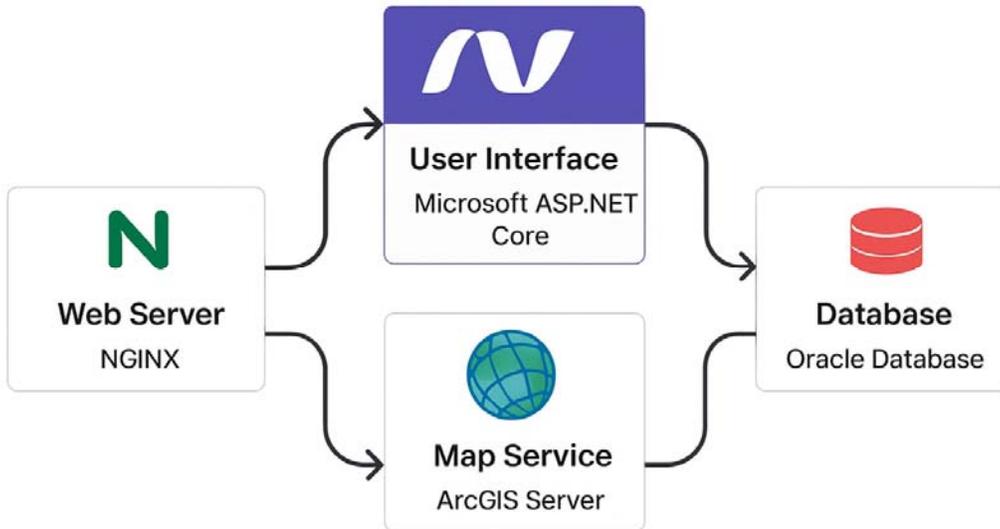


Figure 1.1: System Architecture

- ***Application Server***

The primary development area in the application layer consists of business and data components. The business component is utilized to enforce various business rules and logic, while 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: ASP.Net Core with C#, Java Script
- User Interface: HTML5, CSS Bootstrap 5.
- Framework: Microsoft .NET Framework 8
- Database: Oracle 21c
- Map service: ArcGIS Server

1.3 Software Component

The main interface of the BRIMS is shown in Figure 1.2. To access the BRIMS main home page, simply enter the BRIMS web address (<http://ims.cegisbd.com/rims>) in any browser's address bar.

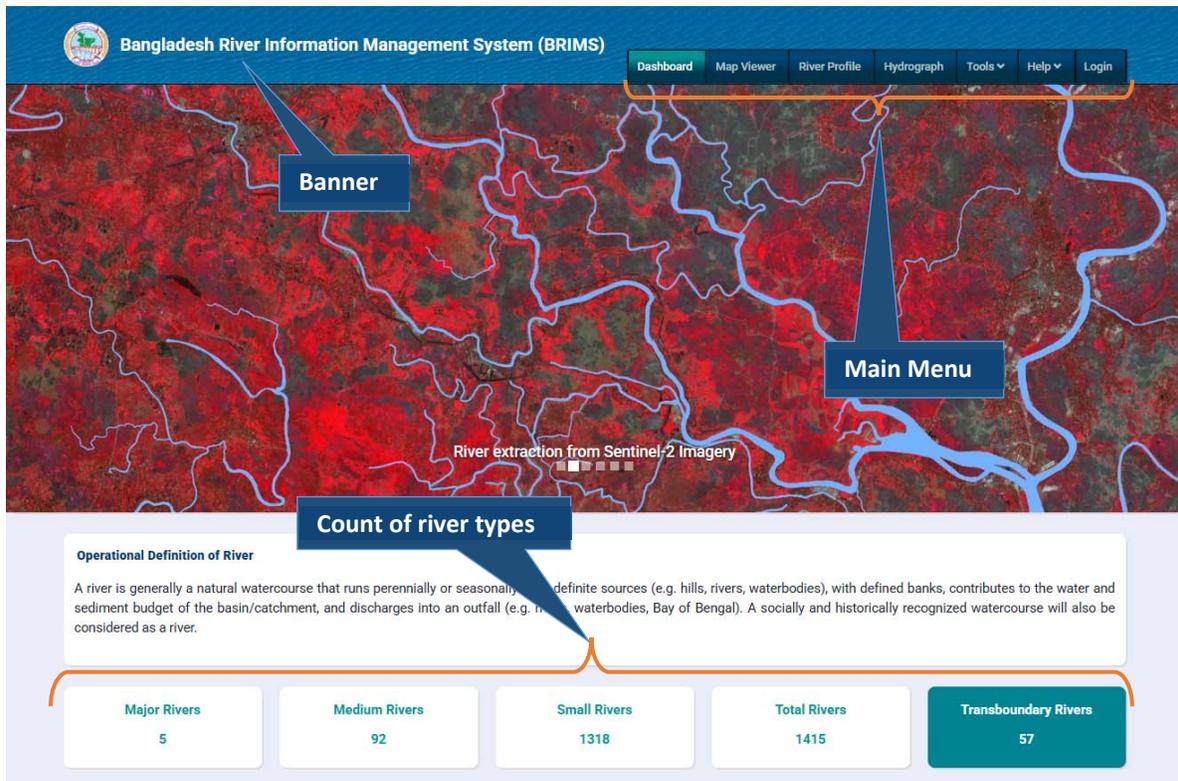


Figure 1.2: Dashboard screen of the BRIMS

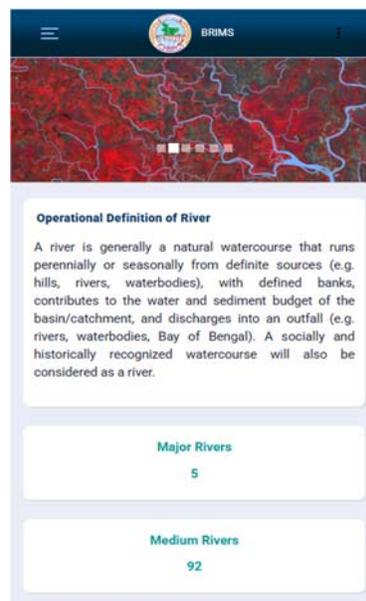


Figure 1.3: Dashboard screen of the BRIMS on Mobile version

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 Feedback)
5. Login

2.1 User Login

User login is necessary whenever a user adds, edits, or deletes data. To log in, place the mouse pointer on the Login menu and click on Login (Figure 1.3, 1.4).

To access the system, users must confidently follow these steps:

Step 1: Enter the User ID in the provided input field.

Step 2: Input the password securely.

Step 3: Click on the Login button decisively.

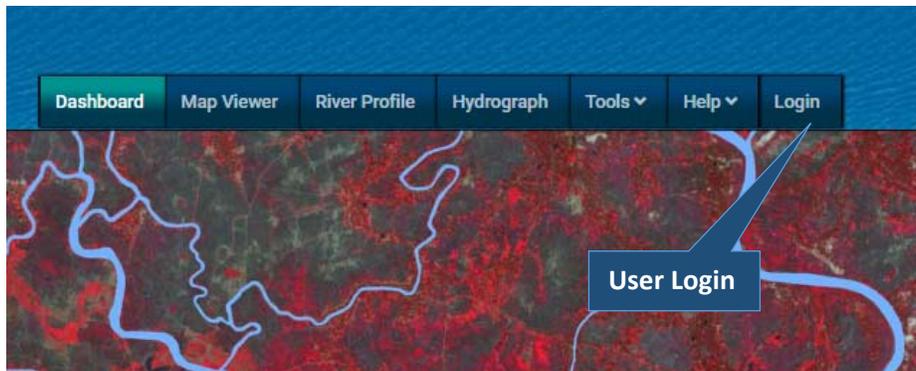


Figure 2.1: Login procedure of the BRIMS Software

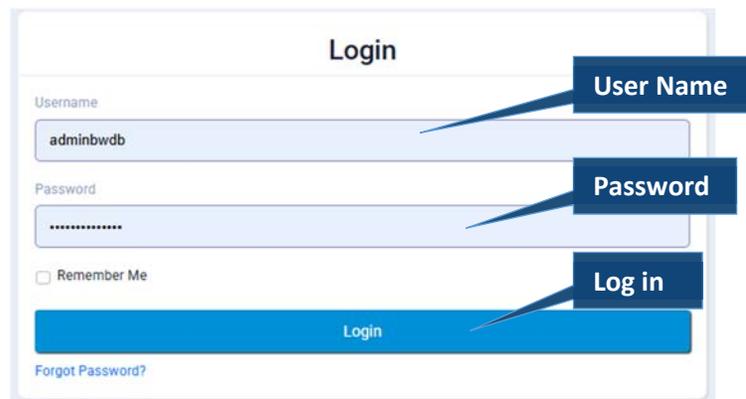
A screenshot of the BRIMS login user interface. The form is titled 'Login' and contains the following elements: a 'Username' input field with the text 'adminbwdb', a 'Password' input field with masked characters '*****', a 'Remember Me' checkbox, a 'Log in' button, and a 'Login' button at the bottom. A blue callout box with the text 'User Name' points to the username input field, another blue callout box with the text 'Password' points to the password input field, and a third blue callout box with the text 'Log in' points to the 'Log in' button. A link for 'Forgot Password?' is located at the bottom left of the form.

Figure 2.2: Login UI

2.2 Dashboard

The dashboard is the system's home page, with menu options, an image slider, and a comprehensive breakdown of various river types and categories. It includes different summary reports (Figure 2.1) such as a pie chart illustrating the percentage of river types, a tabular format presenting the count of rivers according to hydrological regions, and a digital map visualization.

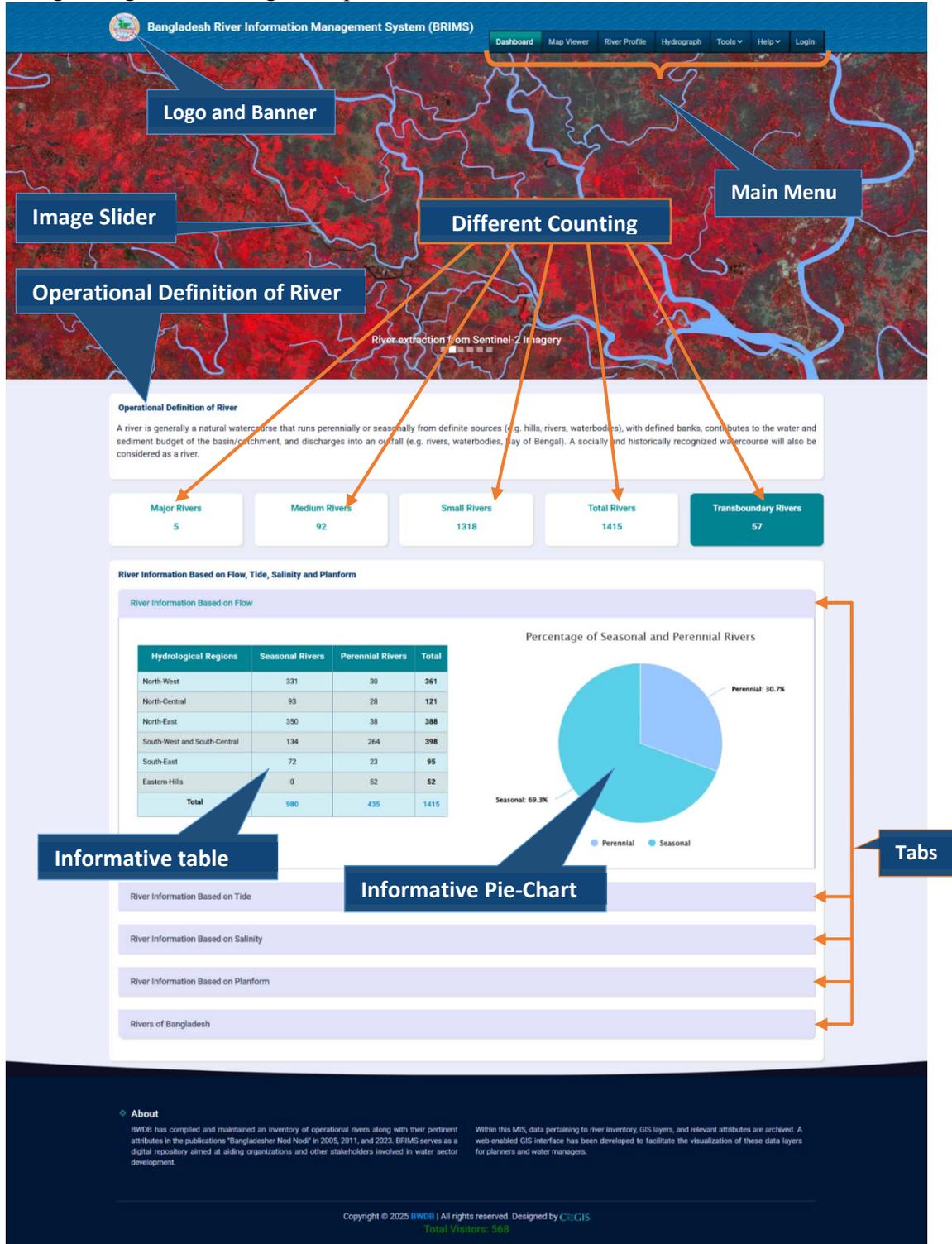


Figure 2.3: Dashboard

In the dashboard, different clickable links enable users to view tabular data (refer to Figure 2.4).

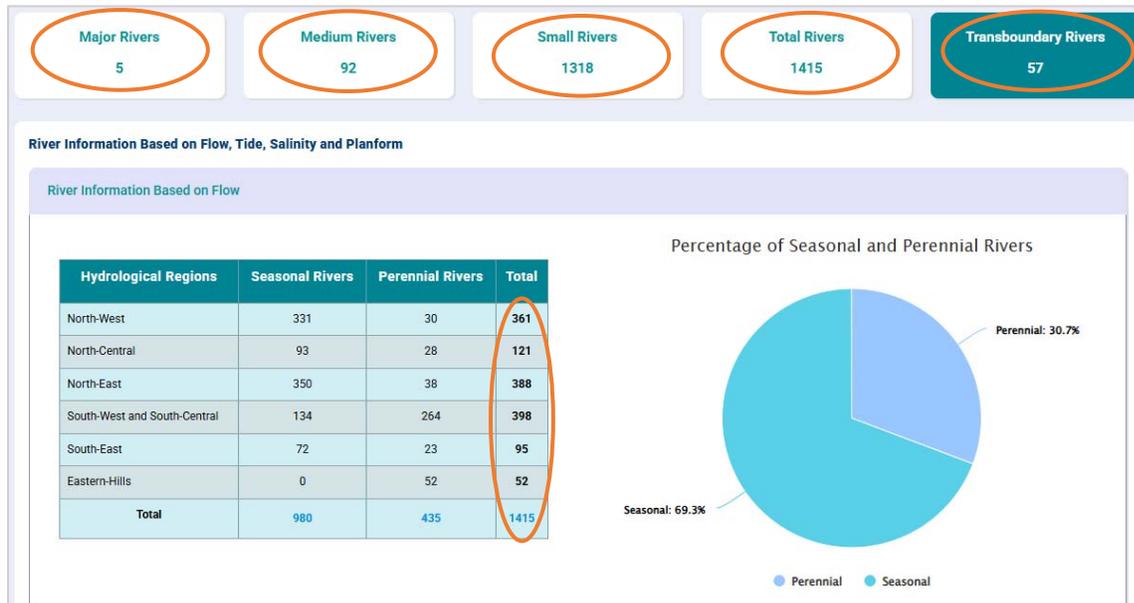


Figure 2.4: Clickable links to view data

Click on these links to view tabular data (Figure: 2.5)

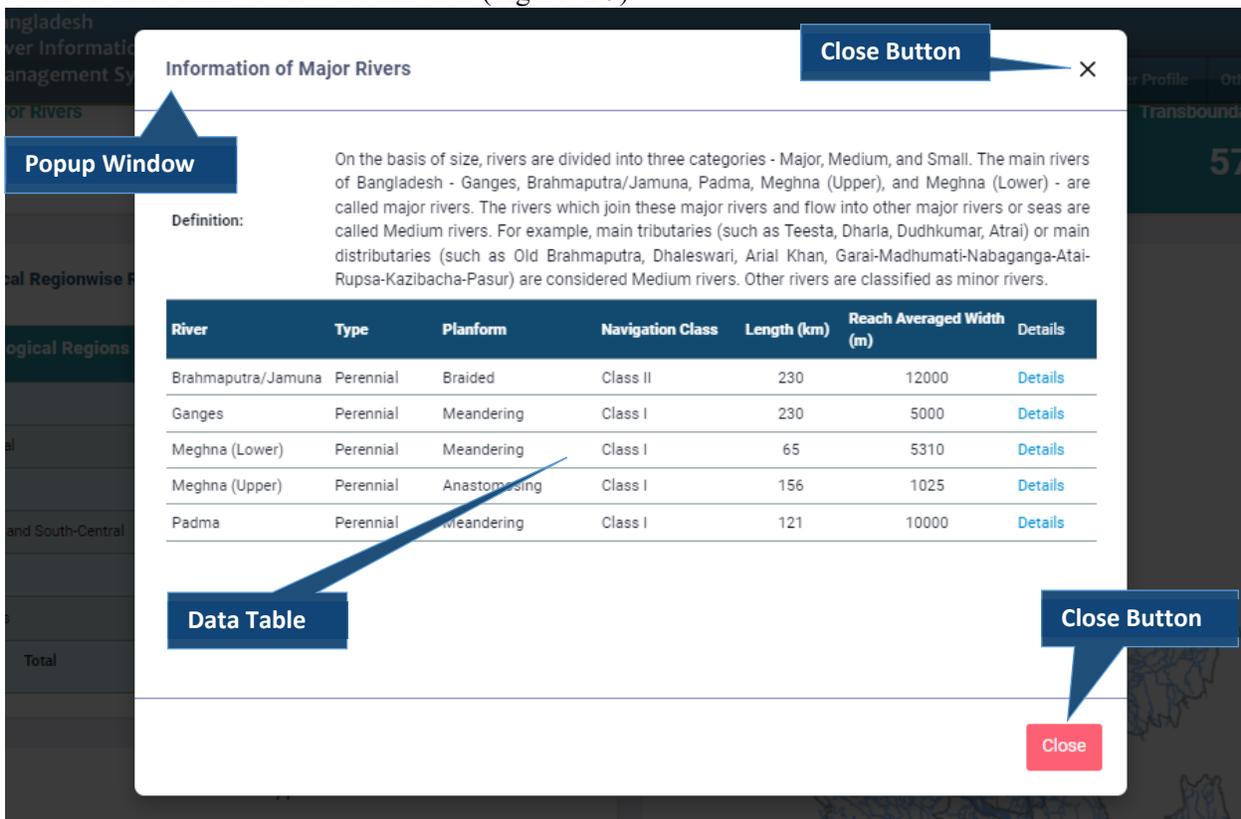


Figure 2.5: River Information using POPUP

3. Map Viewer

This module is designed to display and analyze, spatial data with features such as zoom-in, zoom-out, pan, and superimpose. The Map Viewer also allows users to view identity and attribute information of spatial data layers, and search for rivers using zone, admin boundary, and river as search criteria. All river information is initially loaded into the system. Users can view specific river details by clicking on the target river, triggering a popup view display. The popup view includes information such as water level, discharge, and rainfall, and also provides action buttons to view hydrological status, frequency analysis, and data availability.

When adding data such as water level or discharge, a summary of the parameters is displayed in the left panel. Additionally, the system incorporates a Map Export feature for exporting maps.

3.1 View River Information

In the Map Viewer Module, users can view river data with geological locations and various analytical data on the map dynamically (Figure 3.1).

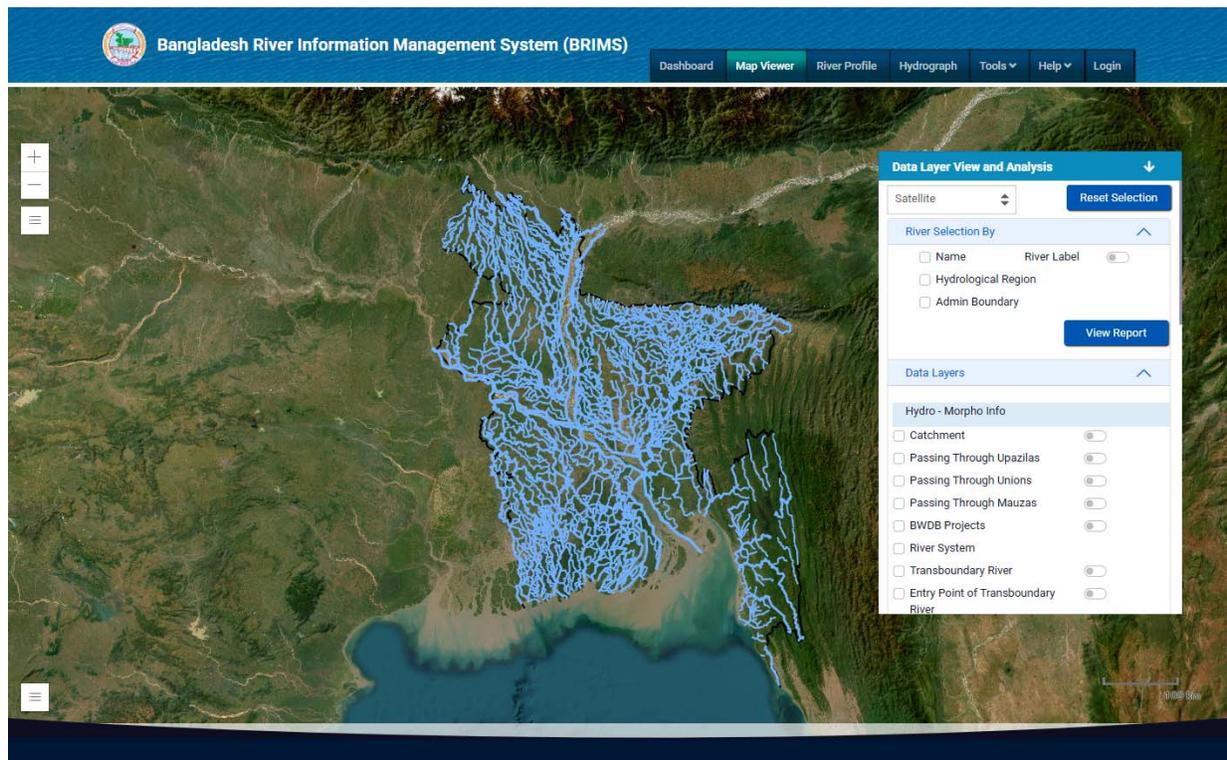


Figure 3.1: Map View Window

A river can be selected by Name, Hydrological Region, and Administrative Boundary (Figure 3.2)

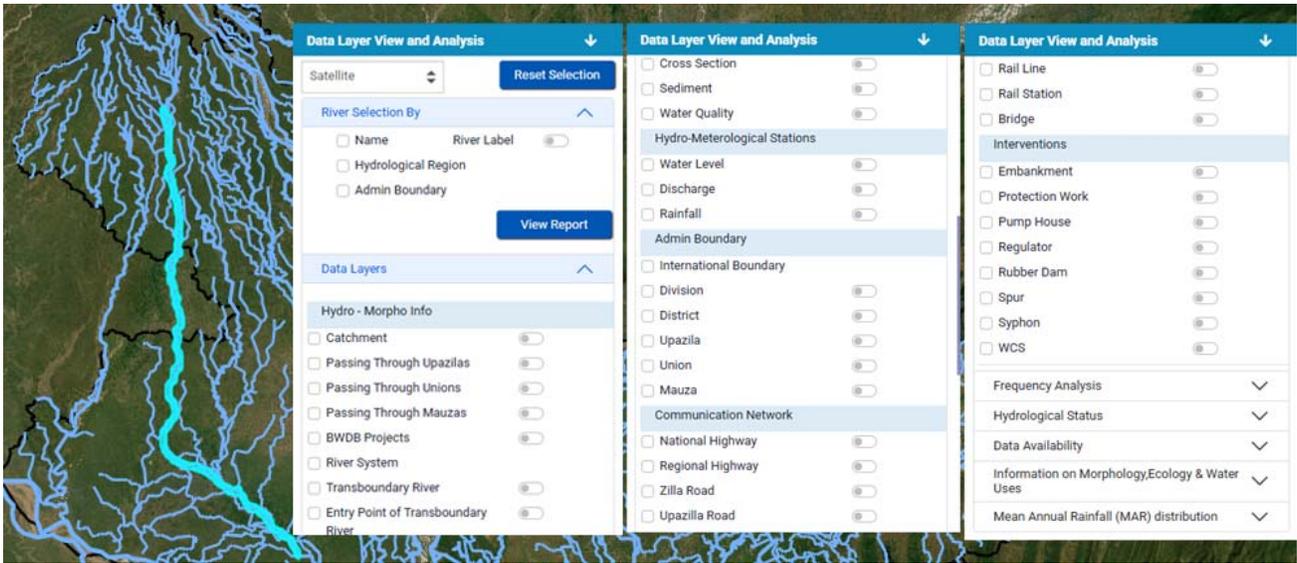


Figure 3.2: River Selection and Data Layers

3.2 Searching River by 'River Name'

Step 1: Select the "Name" option from the search options.

Step 2: Enter the River Name in the search box to search for rivers.

Step 3: Choose the river from the list of displayed rivers to view it on the map (see Figure 3.4).

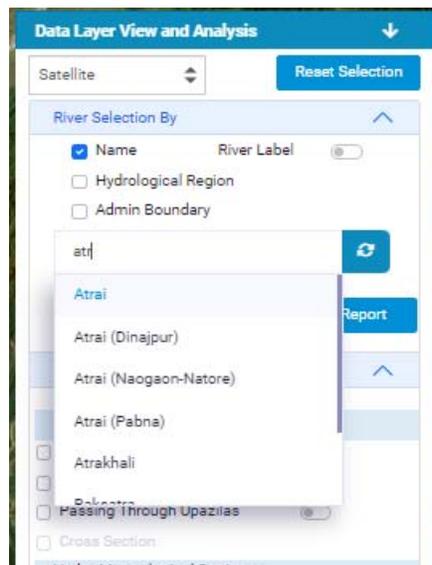


Figure 3.3: Searching River by River Name

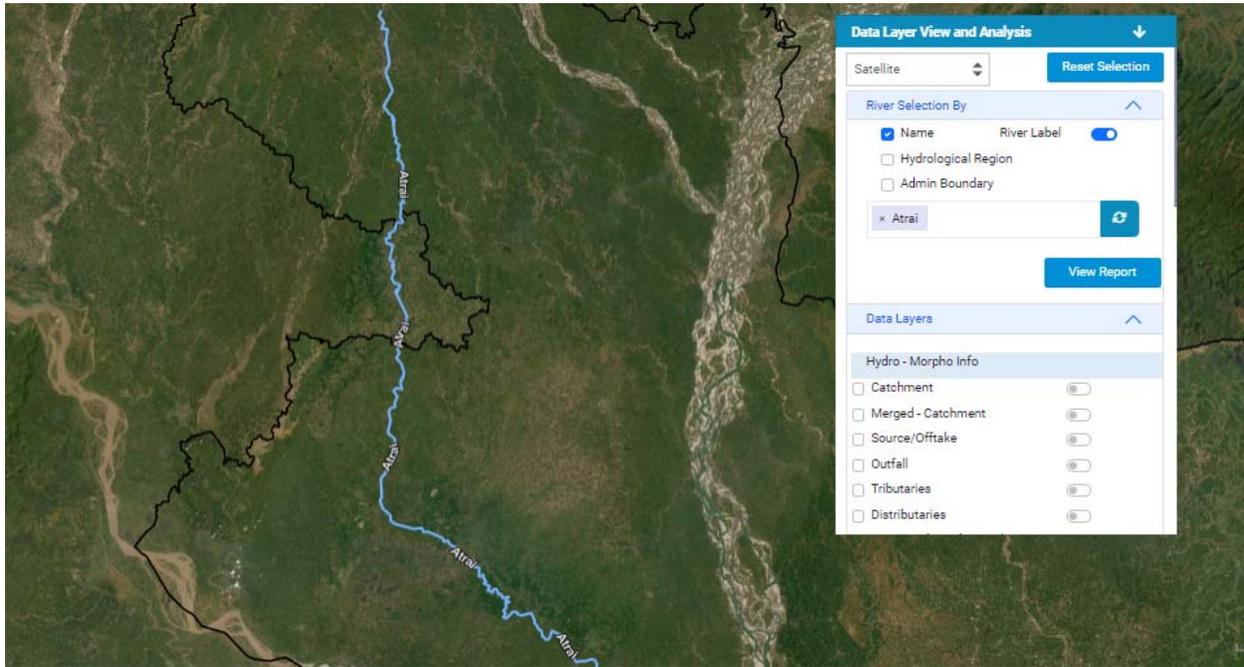


Figure 3.4: Result for Searching River by River Name

3.3 Searching River by ‘Hydrological Region’

Step 1: Select the ‘Hydrological Region’ option from the search option.

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

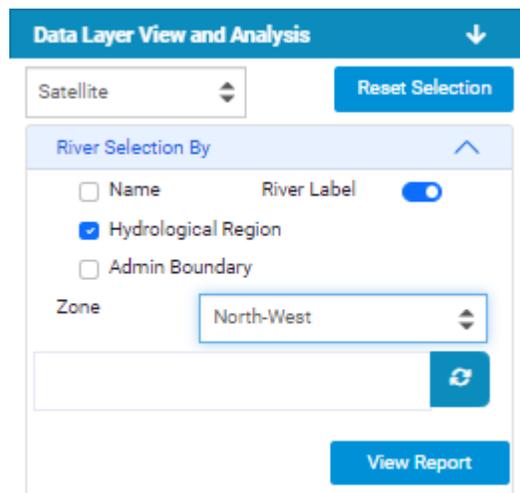


Figure 3.5: Searching River by ‘Hydrological Region’

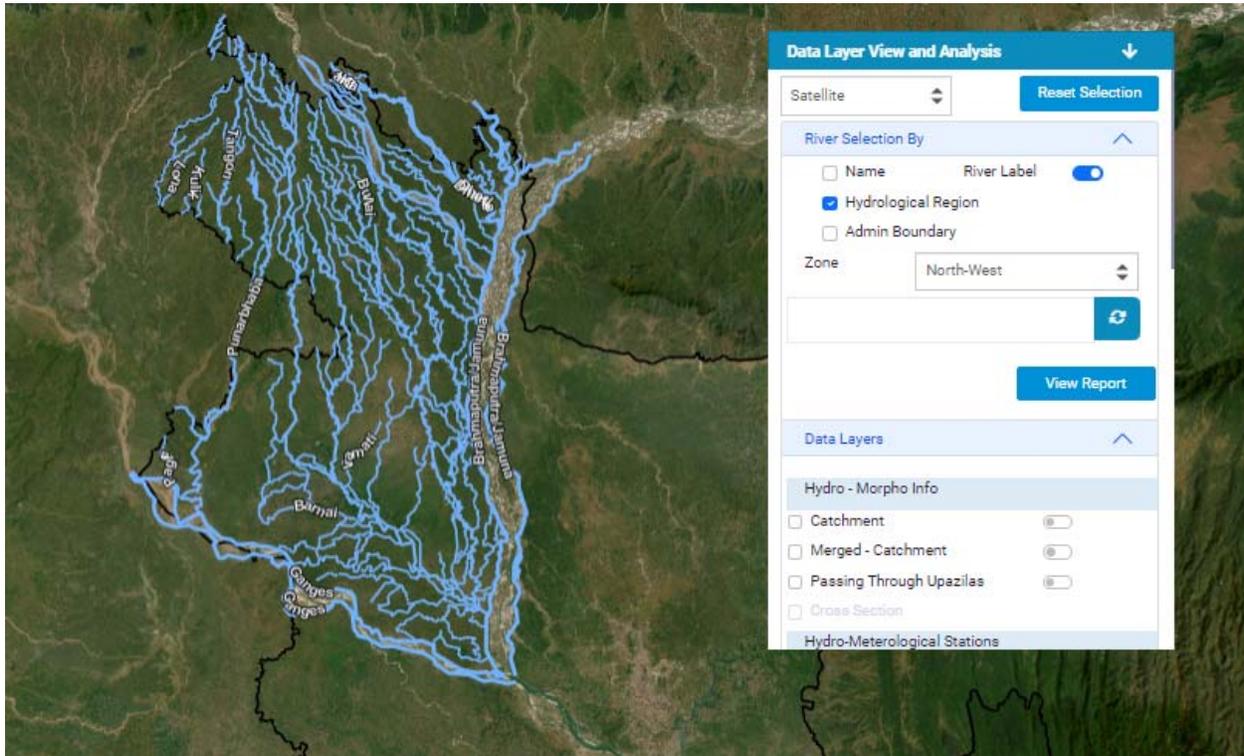


Figure 3.6: Result of Searching River by ‘Hydrological Region’

Using the ‘Hydrological Region’ option instead of searching river by zone, a river can be searched by selecting the river name from the checkbox list. (Figure: 3.7)

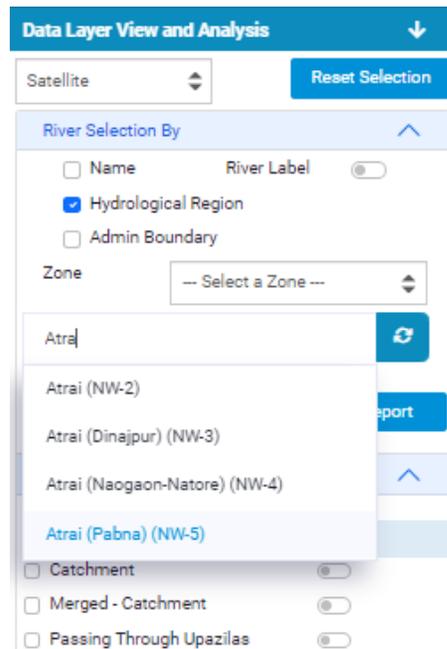


Figure 3.7: Searching River by River Name from the checkbox list in ‘Hydrological Region’ option

3.3 Searching River by the ‘Admin Boundary’

Step 1: Select the ‘Admin Boundary’ option from the search options

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

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

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

The screenshot displays the 'Data Layer View and Analysis' interface. At the top, there is a 'Satellite' dropdown menu and a 'Reset Selection' button. Below this is the 'River Selection By' section, which includes three radio button options: 'Name', 'Hydrological Region', and 'Admin Boundary'. The 'Admin Boundary' option is selected. To the right of these options is a 'River Label' toggle switch, which is turned on. Below the radio buttons are three dropdown menus for 'Division' (Dhaka), 'District' (Narsingdi), and 'Upazilla' (Belabo). A search results box contains two entries: 'x Arial Khan Narsingdi (Lower)' and 'x Bishnondi', with a refresh button to the right. A 'View Report' button is located below the search results. At the bottom, there is a 'Data Layers' section with a 'Hydro - Morpho Info' layer and a 'Catchment' layer, which is currently turned off.

Figure 3.8: Searching River by using the ‘Admin Boundary’ option

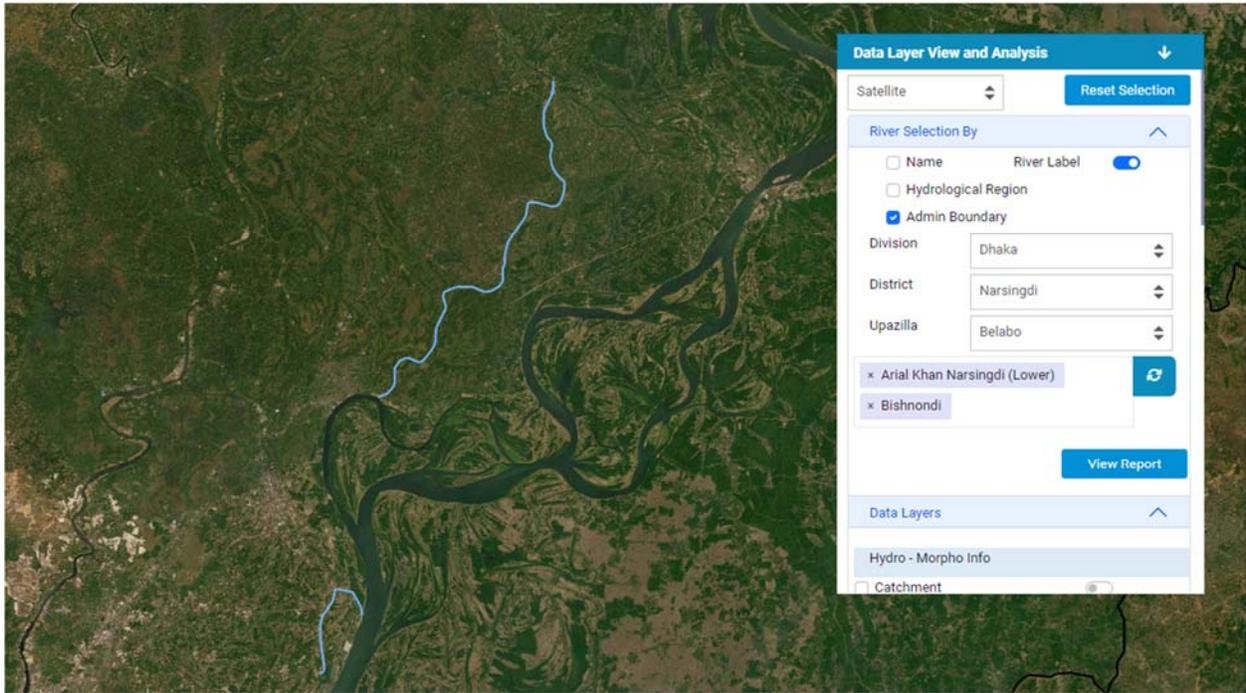


Figure 3.9: Display the Result of Searching River by ‘Admin Boundary’ option

3.4 View River Information

After selecting a river, users can view specific information about the river, including details (Figure 3.10).

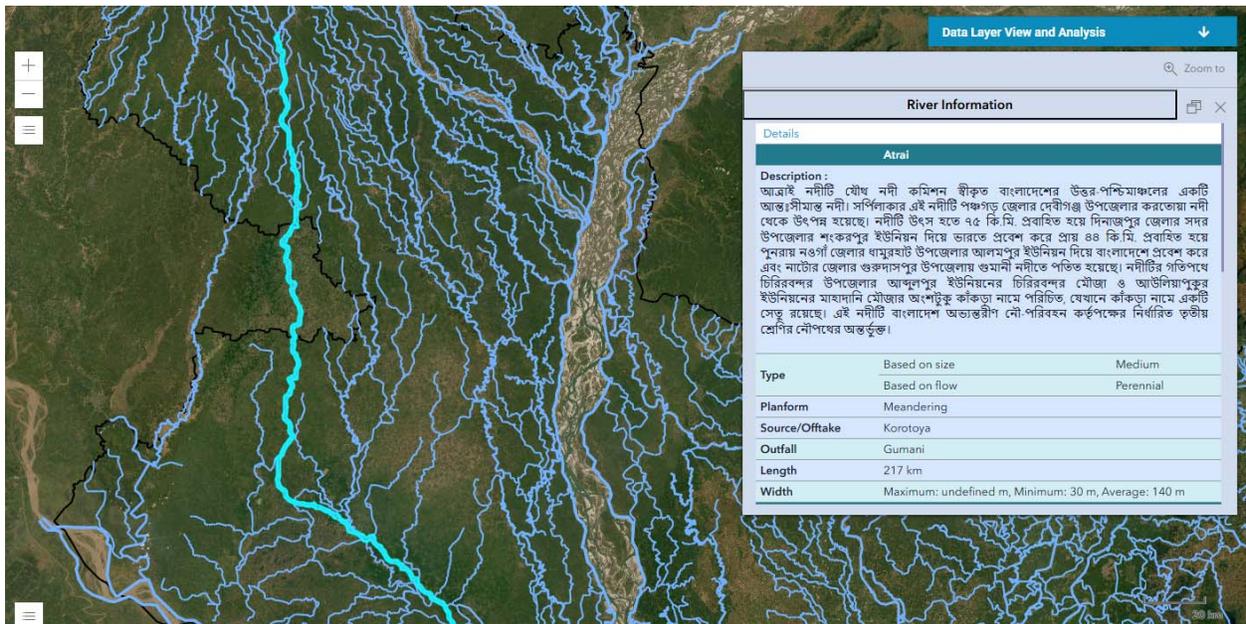


Figure 3.10: Viewing River Information by Selecting River

3.5 Adding Multiple Layer

On the map of the selected river users can add various layers such as Catchment, Sub-Catchment, Offtake, Outfall, Tributaries, and Distributaries. This can be done by following these steps:

Step 1: Select the river from the River Selection section. (Figure: 3.11)

Step 2: Choose the desired layers from the Data Layers section. For example, Water Level and Discharge stations have been included to view information. (Figure: 3.12)

Step 3: Click on the target station on the map to display a data table with all the river information. Each river Information Table has three more features. (Figure: 3.13)

- (a) Data Availability.
- (b) Statistical Info.
- (c) Frequency Analysis.

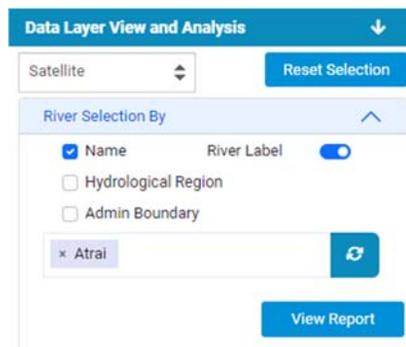


Figure 3.11: Selecting River Name from River Selection Panel

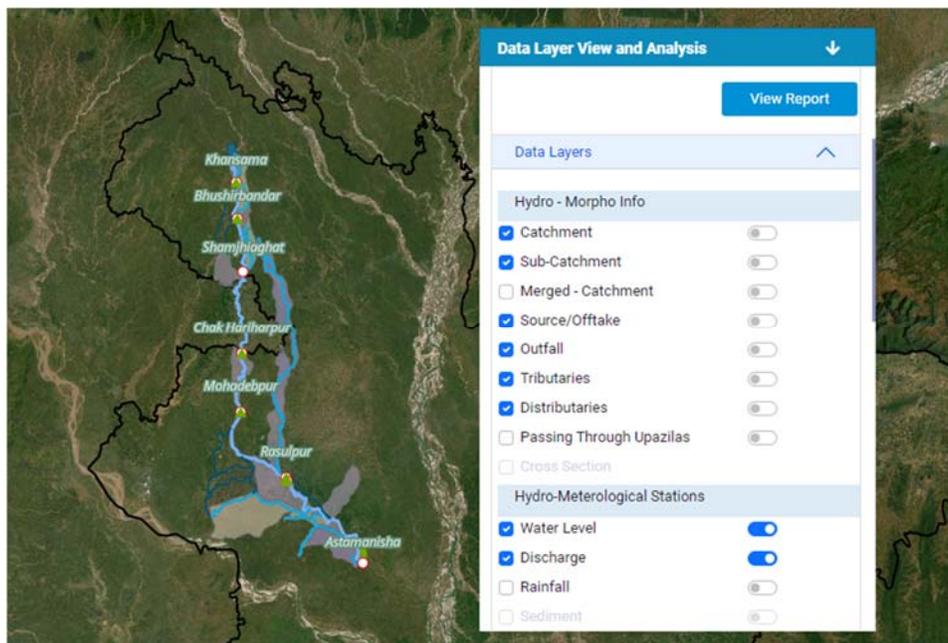


Figure 3.12: Selecting Different Layers from Data Layers

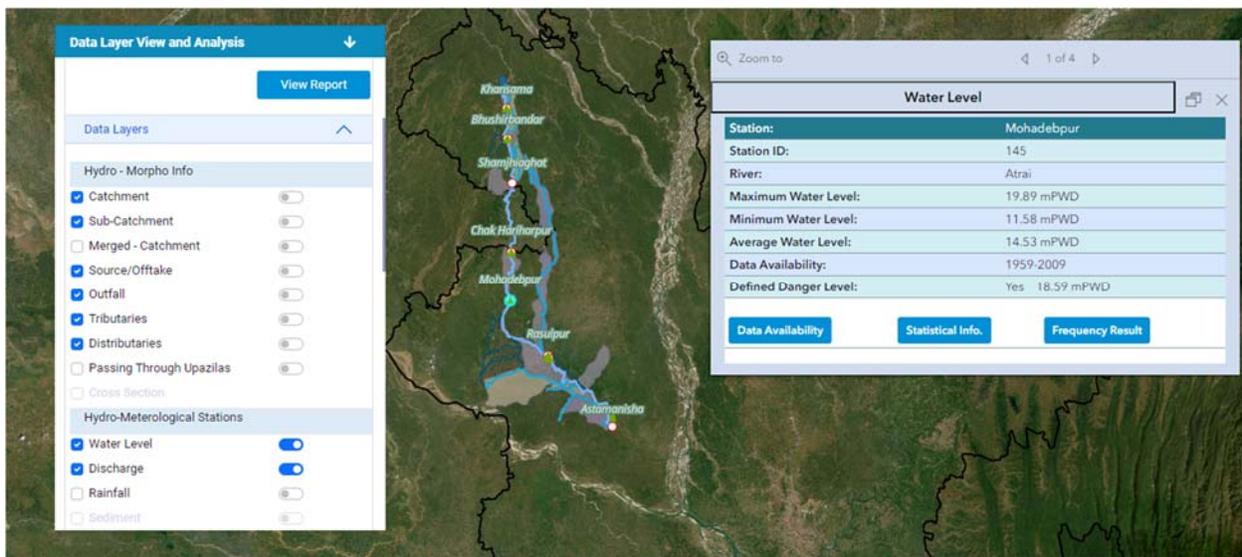


Figure 3.13: River Information Table by Clicking Map Point

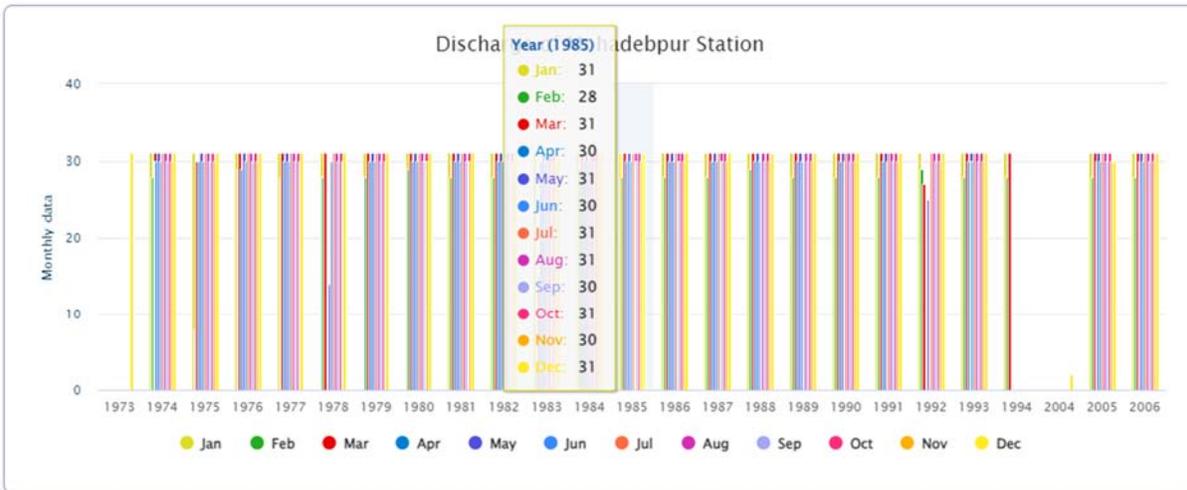
(a) Data Availability

To view data Availability, click on the 'Data Availability' Button and the status will be displayed in Tabular and Graphical Format. (Figure 3.14 and 3.15)

Data Availability

Discharge of Chak Hariharpur Station													
Year	January	February	March	April	May	June	July	August	September	October	November	December	
1989	0	0	0	30	31	30	31	31	30	31	30	31	
1990	31	28	31	30	31	30	31	31	30	31	30	31	
1991	31	28	31	30	31	30	31	31	30	31	30	31	
1992	31	29	31	30	31	30	31	31	30	31	30	31	
1993	31	28	31	30	31	30	31	31	30	31	30	31	
1994	31	28	31	0	0	0	0	0	0	0	0	0	
2006	31	28	31	30	31	30	31	31	30	31	30	30	
2010	2	0	0	0	0	0	2	3	2	0	2	2	
2011	3	0	0	0	0	0	3	2	2	3	2	2	
2012	2	0	0	0	0	0	3	2	3	2	1	1	
2013	0	0	0	0	0	0	2	3	3	2	2	2	
2014	0	0	0	0	0	0	2	2	2	2	2	2	
2015	0	0	0	0	0	0	2	2	2	2	3	2	
2016	0	0	0	0	0	0	2	2	2	3	1	0	
2017	0	0	0	0	0	2	3	2	2	0	0	0	
2018	0	0	0	0	0	0	2	2	2	0	0	0	
2019	0	0	0	0	0	0	2	2	3	0	0	0	
2020	0	0	0	0	0	0	2	3	2	2	2	2	
2021	3	2	0	0	2	2	2	2	2	3	2	2	
2022	2	2	0	0	2	2	0	0	0	0	0	0	

Figure 3.14: Record of Data Availability in Tabular Format.



Close

Figure 3.14: Record of Data Availability in Graphical Format.

(b) Statistical Info.

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

Statistical Information

×

Discharge of Mohadebpur Station					
Station	Year	Maximum Value (m ³ /sec)	Minimum Value (m ³ /sec)	Average Value (m ³ /sec)	Sum (m ³ /sec)
145	1973	37.60	29.10	32.49	1007.10
145	1974	1180.00	15.40	195.38	71313.40
145	1975	708.00	1.75	102.58	35287.39
145	1976	1080.00	3.85	114.52	41798.13
145	1977	818.00	3.62	99.56	36337.84
145	1978	978.00	5.91	111.87	35575.41
145	1979	1190.00	2.74	110.09	40183.62
145	1980	871.00	7.59	125.43	45906.19
145	1981	776.00	5.23	118.33	43191.78
145	1982	647.00	5.89	88.19	32191.05
145	1983	831.00	6.61	138.15	44760.38
145	1984	1030.00	7.43	150.99	55262.23
145	1985	1070.00	3.80	149.50	54569.18
145	1986	890.00	8.62	119.01	43438.27
145	1987	1160.00	8.87	197.19	71972.71
145	1988	1170.00	8.73	152.47	55804.86
145	1989	1040.00	5.51	176.17	64301.84
145	1990	929.00	10.90	146.86	53602.60
145	1991	1620.00	10.90	193.34	70567.90
145	1992	1200.00	12.10	140.05	45656.50
145	1993	1140.00	13.10	145.48	53101.00

Figure 3.16: Record of 'Statistical Info.' In Tabular Format.

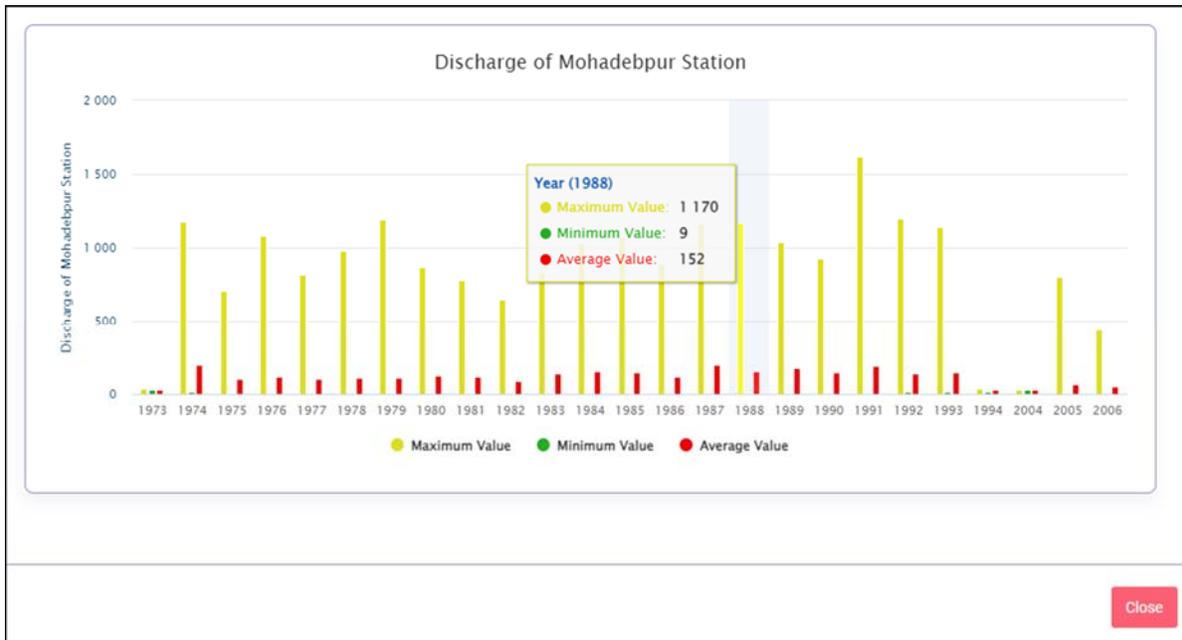


Figure 3.17: Record of ‘Statistical Info.’ in Graphical Format.

(c) Frequency Analysis

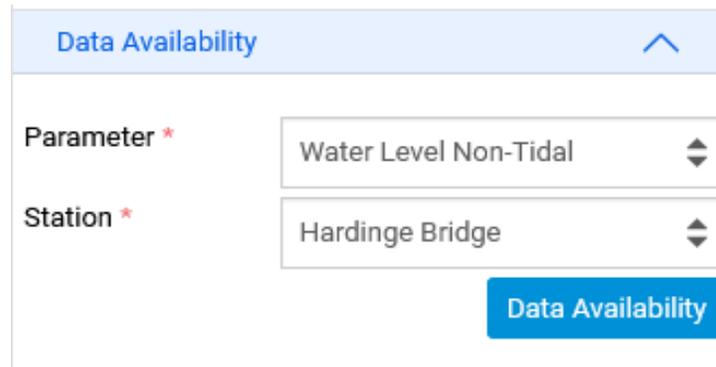
To view data Availability, click on the ‘Data Availability Status’ Button, and the status will be displayed in Tabular and Graph Format. (Figure 3.18)

StationId	Return Period	Discharge(m3/sec)
145	5	992.20
145	10	1056.27
145	15	1088.44

Figure 3.18: Resultant Table of Frequency Analysis

3.6 Data Availability

Select the required option from the Data Availability Panel to view the scenario in graphical and tabular format. The figures display the monthly number of records for different parameters such as Water Level, Discharge, and Rainfall available in the system.



The image shows a web interface titled "Data Availability" with a blue header bar containing the title and an upward-pointing arrow. Below the header, there are two dropdown menus. The first is labeled "Parameter *" and has "Water Level Non-Tidal" selected. The second is labeled "Station *" and has "Hardinge Bridge" selected. Below these menus is a blue button with the text "Data Availability".

Figure 3.19: Selecting the Required Option from the Data Availability Panel

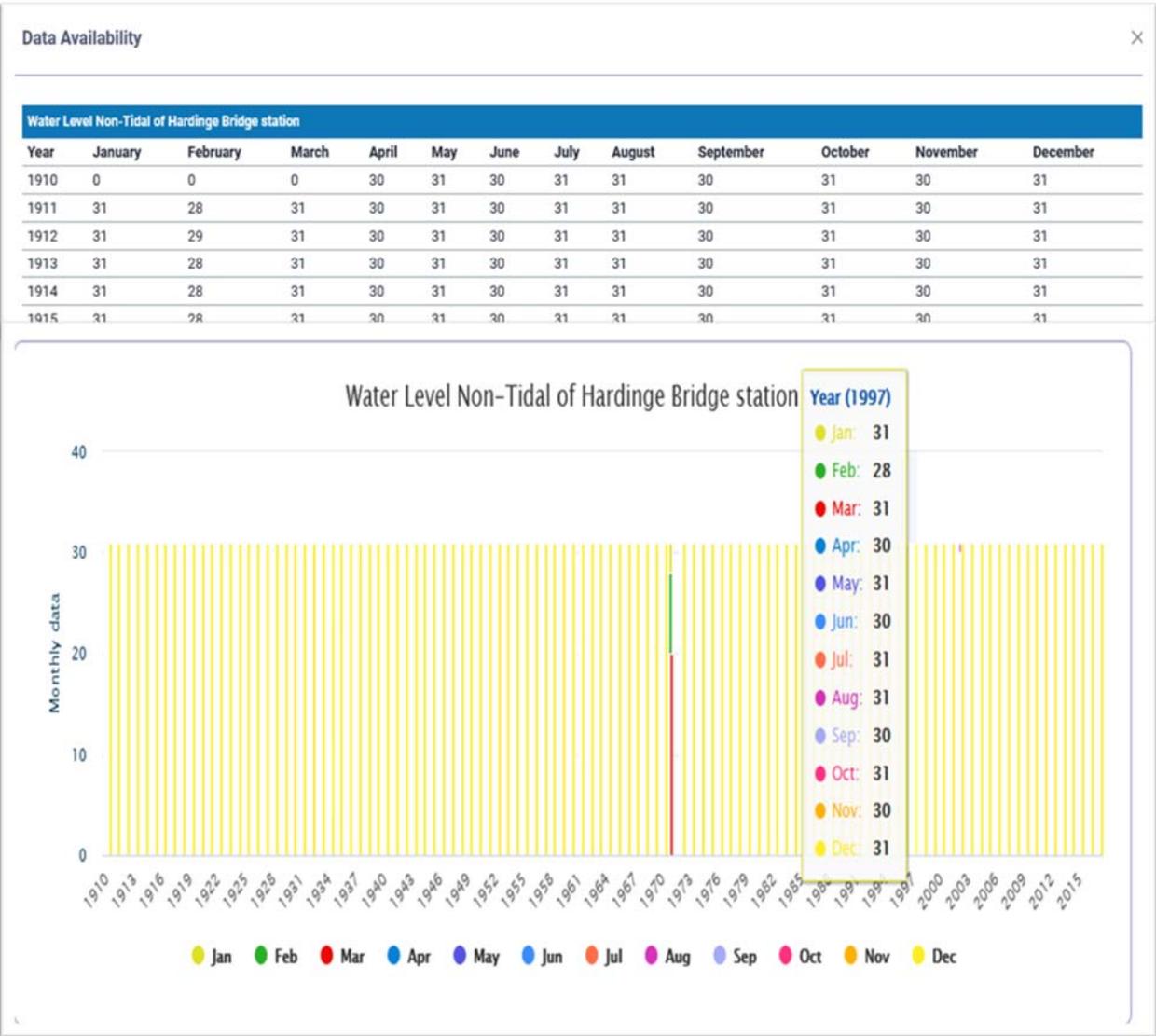


Figure 3.20: Monthly Record of Data Availability in Graphical and Tabular Format.

3.5 Hydrological Status

Selection required option from the Hydrological Status Panel to view the scenario in Graph and Tabular format. (Figure: 3.21)

Hydrological Status ^

Parameter *

Stations *

Value Fields *

Function *

Interval*

Start-End *

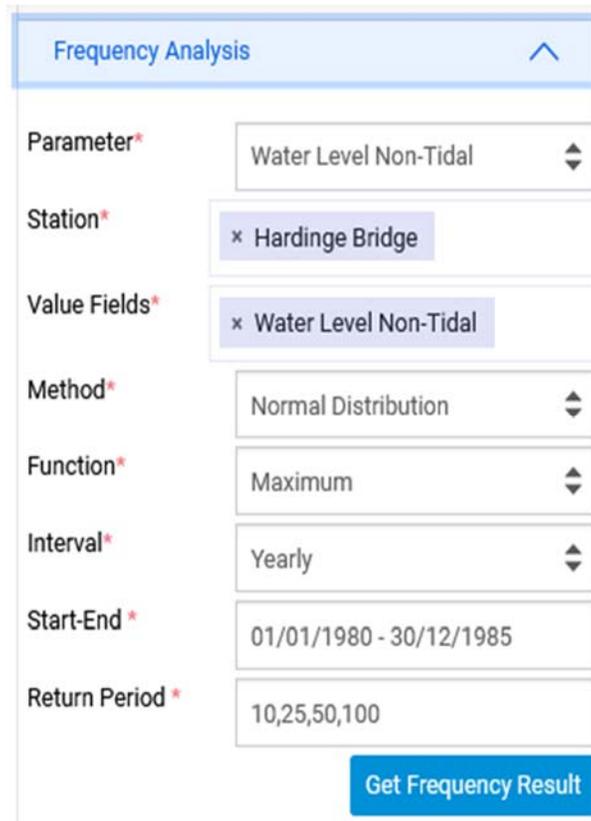
Figure 3.21: Selecting the Required Option from the Hydrological Status Panel



Figure 3.22: View Hydrological Status

3.5 Frequency Analysis

Select the required option from the Frequency Analysis Panel to view the result in Graphical and Tabular format. (Figure: 3.23) The result can be shown with stationid, Return Period, and Parameter name. (Figure: 3.24)

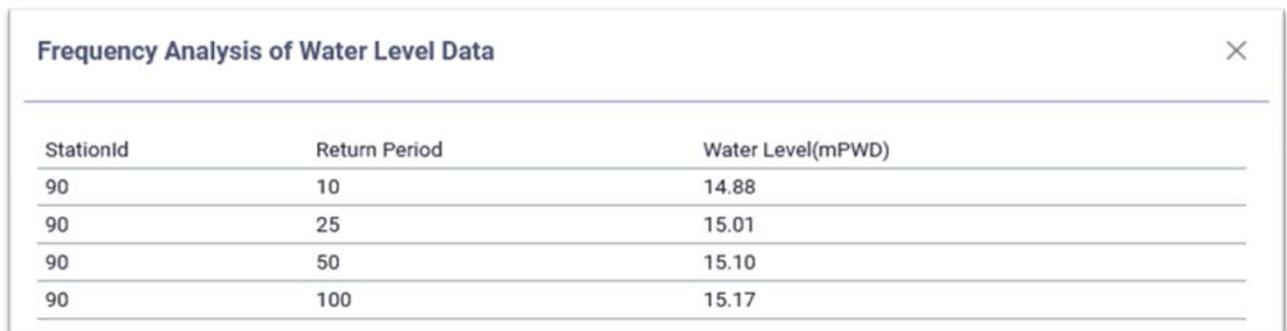


The screenshot shows a 'Frequency Analysis' panel with the following settings:

- Parameter*: Water Level Non-Tidal
- Station*: x Hardinge Bridge
- Value Fields*: x Water Level Non-Tidal
- Method*: Normal Distribution
- Function*: Maximum
- Interval*: Yearly
- Start-End*: 01/01/1980 - 30/12/1985
- Return Period*: 10,25,50,100

A 'Get Frequency Result' button is located at the bottom right of the panel.

Figure 3.23: Selecting the Required Option from the Frequency Analysis Panel



The screenshot shows a table titled 'Frequency Analysis of Water Level Data' with the following data:

StationId	Return Period	Water Level(mPWD)
90	10	14.88
90	25	15.01
90	50	15.10
90	100	15.17

Figure 3.24: Resultant Table of Frequency Analysis

4. River Profile

Users can search and view river information by Hydrological Region or Administrative Boundary.

Step 1: Click on the Hydrological Region and select a region from the dropdown (Figure: 4.1)

Step 2: A list of rivers from the selected region will be loaded into the river list (Figure: 4.1).

Step 3: A data table will load below as a search result with selected River list information. (Figure: 4.2)

Step 4: The data table has a search bar at the top right side and three buttons on the right side of each row for View Details in English/Bangla and other one for View Full Details (Figure: 4.3).

Step 5: In the List of River Panel, there are three buttons to view river details: first two for river details report based on availability and other for river details report based on the data fields (Figure: 4.3).

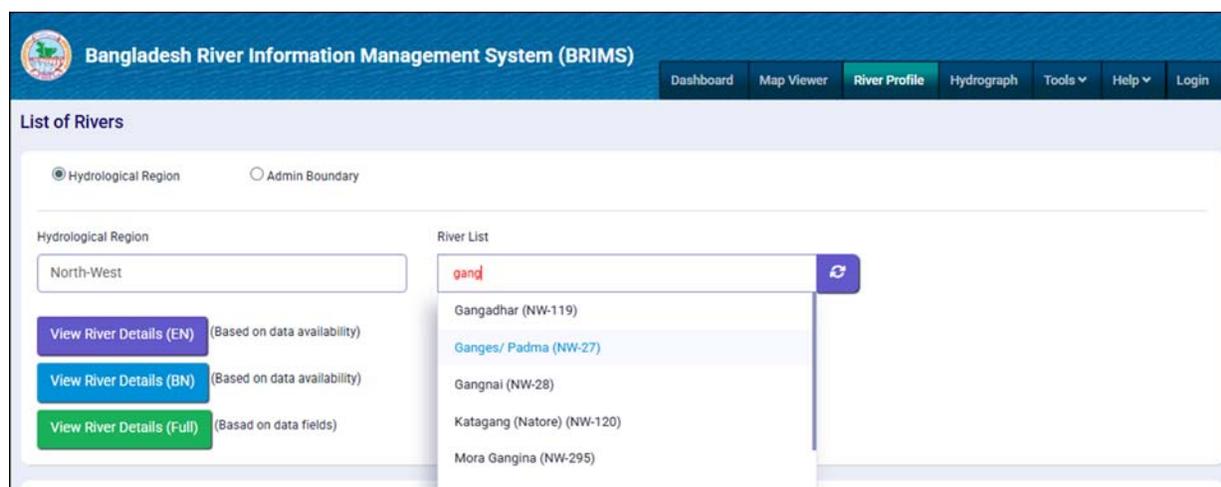


Figure 4.1: Selection of river from List of Rivers Panel

SN	নদীর নাম	নদীর নাম (স্থানীয়)	River Name	River Local Name	River Id	River Type	Action
1	আখিরা	আখিরা-মচা/ আখিরা/ মচা/ আখিরা-মচা	Akhira	Akhira-Maccha/ Akhira/ Maccha/ Akhira-Machcha	NW-1	A (In dimension): Small B (In seasonality): Seasonal C (Transboundary): No	EN BN Full
2	আলাই (গাইবান্ধা)	মরা মানস	Alai (Gaibandha)	Mora Manos	NW-6	A (In dimension): Small B (In seasonality): Seasonal C (Transboundary): No	EN BN Full
3	আলাইকুমারী	আলাইকুমারী (পঞ্চগড়)	Alai Kumari	Alai Kumari (Panchagarh)	NW-200	A (In dimension): Small B (In seasonality): Seasonal C (Transboundary): No	EN BN Full

Figure 4.2: View River Information in a customized way as per user.

The screenshot shows the BRIMS interface with a 'List of Rivers' section. It includes a search box, a table of rivers, and three buttons for viewing details: 'View River Details (EN)', 'View River Details (BN)', and 'View River Details (Full)'. Callouts point to these buttons and the search box.

SN	নদীর নাম	নদীর নাম (আইডি)	River Name	River Local Name	River Id	River Type	Action
1	আখিরা	আখিরা-মাক্কা/ আখিরা/ মাক্কা/ আখিরা-মাক্কা	Akhira	Akhira-Maccha/ Akhira/ Maccha/ Akhira-Machcha	NW-1	A (In dimension): Small B (In seasonality): Seasonal C (Transboundary): No	EN BN Full
2	আলাই (গাইবান্ধা)	মারা মানস	Alai (Gaibandha)	Mora Manos	NW-6	A (In dimension): Small B (In seasonality): Seasonal C (Transboundary): No	EN BN Full

Figure 4.3: River Information Table

4.1 View Details

Click the View button on the data table to open a new page displaying the selected river information in view mode (Figure 4.4).

- Every view table has a print button at the top to print the river information report.
- There are some checkboxes to filter the information sections in the table to view.
- This report will contain all the selected river information one after the other.

The screenshot shows the 'River Profile' page for 'আইডি নং: NW-2'. It includes a 'Print Button' and a 'Filtering Checkbox' for various sections like General Information, Hydrology, Morphology, Water Uses, Ecology, Structure, and Map.

উৎসমূহ/ প্রবেশস্থল	নদী/নিয়াকল/পাথড়/সমুদ্র	মৌজা	ইউনিয়ন	উপজেলা	জেলা	বিভাগ	অক্ষাংশ	দ্রাঘিমাংশ
উৎসমূহ/ প্রবেশস্থল	করকোয়া নদী	রসুলপুর	সোনামার মল্লিকসদর	দেবীগঞ্জ	পঞ্চগড়	রংপুর	২৩° ১' ৫৫.০২"	৮৮° ৪২' ১০.৯৫"
পতিতমুখ	গুমনি নদী	চাঁওকড়া (আশা)	ওয়ার্ড নং: ০৯	গুজদাসপুর	নাটোর	রাজশাহী	২৪° ২২' ২৬.১৪"	৮৯° ১৫' ১০.২৭"

Figure 4.4: View Details

4.2 View River Details (Based on Availability)

By clicking on the View River Details (Based on Availability) button a new page will load with selected river information based on the available data in the database.

- Every view table has a print button at the top to print the river information report.
- There are some checkboxes to filter the information table to view.
- This report will contain all the selected river information one after the other.

River Profile
Home / List of Rivers / River Information

Print Button

Filtering Checkbox

Back to List | Print

General Information Hydrology Morphology Water Uses Ecology Structure Map

নদীর নাম: আব্রাই আইডি নং: NW-2

১. সাধারণ তথ্যাবলি

১.১	বর্ণনা	আব্রাই নদীটি ষোথ নদী কমিশন স্বীকৃত বাংলাদেশের উত্তর-পশ্চিমাঞ্চলের একটি আন্তঃসীমান্ত নদী। সর্পিণাকার এই নদীটি পঞ্চগড় জেলার দেবীগঞ্জ উপজেলার করতোয়া নদী থেকে উৎপন্ন হয়েছে। নদীটি উৎস হতে ৭৫ কি.মি. প্রবাহিত হয়ে দিনাজপুর জেলার সদর উপজেলার শংকরপুর ইউনিয়নে ভারতে প্রবেশ করে প্রায় ৪৪ কি.মি. প্রবাহিত হয়ে পুনরায় নওগাঁ জেলার ধামুরহাট উপজেলার আলমপুর ইউনিয়ন দিয়ে বাংলাদেশে প্রবেশ করে এবং নাটোর জেলার গুরুদাসপুর উপজেলায় গুমানি নদীতে পতিত হয়েছে। এই নদীটি বাংলাদেশ অভ্যন্তরীণ নৌ-পরিবহন কর্তৃপক্ষের নিধারিত তৃতীয় শ্রেণির নৌপথের অন্তর্ভুক্ত।
১.২	নদীর প্রকার	আকারের ভিত্তিতে: মাঝারি প্রবাহের ভিত্তিতে: বারোমাসি
১.৩	প্র্যানফর্ম	সর্পিণাকার

১.৪ নদীর উৎসমুখ/প্রবেশস্থল/পতিতমুখ

	নদী/নিদ্রাঞ্চল/পাহাড়/সমুদ্র	মৌজা	ইউনিয়ন	উপজেলা	জেলা	বিভাগ	অক্ষাংশ	ত্রাঘিমাংশ
উৎসমুখ/ প্রবেশস্থল	করতোয়া নদী	রসুলপুর	সোনাঘার মল্লিকদহ	দেবীগঞ্জ	পঞ্চগড়	রংপুর	২৬° ১' ৫৫.৩২"	৮৮° ৪২' ১০.৯৫"
পতিতমুখ	গুমানি নদী	চাঁচকৈড় (অংশ)	ওয়ার্ড নং ০৯	গুরুদাসপুর	নাটোর	রাজশাহী	২৪° ২২' ২৬.১৪"	৮৯° ১৫' ১৩.২৭"

১.৫	দৈর্ঘ্য	২১৭ কি.মি.
১.৬	প্রস্থ	সর্বোচ্চ: ৫৯০ মি. গড়: ১৪০ মি. সর্বনিম্ন: ৩০ মি.

Figure 4.5: View River Details (Based on Availability)

This river detail report contains all the fields with or without data. If any field has no data, then it shows empty field with caption only.

4.3 Edit/Update River information

Step 1: To update/edit data, there must be an authentic user need to **login**. Then another button will be visible in the River Information Table, which is the Edit button (Figure 4.6).

Step 2: Now click on the Edit button, the actino will take to the Edit/Update page (Figure 4.7).

River List

Show 10 entries

Add New River Show All Rivers

Search:

Edit Button

SN	River Name	River Id	River Type	Planform	Action
1	Abua (Nandia Gang)	NE-2	A (In dimension): Small B (In seasonality): Seasonal C (Transboundary): No	Meandering	 EN BN Full
2	Adi Buriganga	NC-85	A (In dimension): Small B (In seasonality): Seasonal C (Transboundary): No	Meandering	 EN BN Full

Figure 4.6: River Information Table with Edit button.

Update River Information

Home / List of Rivers / Update River Information

Back to List

Seven Tabs

General Description Hydrological Information Morphological Information Water Uses Ecological Information Structural Information Map

General Information

***NOTE: Press **Ctrl+M** to switch to **English** in the Bangla textboxes. Hit Space, Enter or Tab to transliterate.

Zone * River Name (Bengali) * River Name (English) *

North-West গঙ্গা/পদ্মা Ganges

River Id (Code) * River Local Name (Bengali) River Local Name (English)

NW-27 পরিষ্কামুলক

Description (Maximum 1107/4000 Bangla Characters)

গঙ্গা/পদ্মা ভারত-বাংলাদেশের একটি আন্তঃসীমান্ত নদী। নদীটি হিমালয় পর্বতের গঙ্গোত্রী হিমবাহ থেকে উৎপন্ন হয়ে বিভিন্ন উপনদীর মাধ্যমে হিমালয় পর্বতের দক্ষিণ ঢালের সকল প্রবাহ বহন করে বাংলাদেশে প্রবেশ করে। নদীটি ভারতে উত্তরাখণ্ড, উত্তর প্রদেশ, বিহার, ঝাড়খণ্ড ও পশ্চিমবঙ্গ দিয়ে প্রবাহিত হয়ে চাঁপাইনবাবগঞ্জ জেলার শিবগঞ্জ উপজেলার মনাকবা ইউনিয়ন দিয়ে বাংলাদেশে প্রবেশ করে। নদীটি বাংলাদেশ ও ভারতের আন্তর্জাতিক সীমানা বরাবর প্রায় ১১০ কি.মি. প্রবাহিত হচ্ছে। পরবর্তীতে বাংলাদেশের অভ্যন্তরে যমুনা নদীর সাথে মিলিত হওয়ার আগ পর্যন্ত স্থানীয়ভাবে পদ্মা নামে পরিচিত) এর দৈর্ঘ্য হচ্ছে প্রায় ১২০ কি.মি.। ১৯৭৫ সালে ভারত সরকার গঙ্গা নদীর উপর বাংলাদেশ-ভারত সীমানার খুব কাছাকাছি ফারাক্কা বাঁধ নির্মাণ করে। তখন থেকে এ বাঁধের ফলে শুষ্ক মৌসুমে দক্ষিণাঞ্চলের পানি প্রবাহ মারাত্মকভাবে ব্যাহত হচ্ছে। এ নদী বাংলাদেশ আভ্যন্তরীণ নৌ-পরিবহন কর্তৃক নির্ধারিত প্রথম শ্রেণীর নৌপথ। গড়াই

***NOTE: Type Bangla Unicode

Description (Maximum 0/4000 English Characters)

Transboundary (Yes/No) * Transboundary JRC (Yes/No) * River Type (In Dimension) River Type (In Seasonality)

Yes Yes Major (বড়) Perennial (বারোমাসি)

Figure 4.7: River Information Edit/Update page.

Step 3: Change or add necessary information to the input boxes then click on the save button to store the data in the database (Figure 4.8).

Branch Rivers Exist? Branch Rivers (If Yes in Bangla) Branch Rivers (If Yes in English) Connectivity with Khals

No নাই

Connectivity (If Yes in Bangla) Connectivity (If Yes in English) Navigation Route Class Saline/Nonsaline

আছে

Class I (প্রথম শ্রেণী) Non-Salinity (নাই)

***NOTE: Type Bangla Unicode

Save Button

Save

Figure 4.8: Save River Information data.

4.4 Print Report

Users can easily print the river details report from the newly loaded river details page by clicking the print button.

The screenshot displays a print report for a river. The report is titled "নদীর নাম: আড়াই" and "আইডি নং: NW-2". It contains several sections of information:

- 1. সাধারণ তথ্যাবলি:**
 - 1.1 **নদী:** আড়াই নদীটি উদয় নদী অধিনেত্রীকৃত বাংলাদেশের উত্তর-পশ্চিমাঞ্চলের একটি আড়াইনদীর নদী। অধিনেত্রণের এই নদীটি পশ্চিমতে জেলার খেচিগঞ্জ উপজেলায় অবস্থিত নদী থেকে উৎপন্ন হয়েছে। নদীটি উদয় নদে ১০ কি.মি. প্রান্তিক হয়ে নিম্নোক্ত জেলার সবার উপজেলায় শাকতপুর ইউনিয়নে গড়তে প্রবেশ করে গঙ্গা নদীতে। প্রান্তিক হয়ে পুনরায় নদীটি জেলার আড়াইনদী উপজেলায় আসতপুর ইউনিয়নে গিয়ে বাংলাদেশ প্রবেশ করে এবং আড়াইনদীর জেলার জলসঙ্গম উপজেলায় গুহামি নদীতে পতিত হয়েছে। এই নদীটি বাংলাদেশ আরাইল নদী-পরিবহন কর্তৃপক্ষের নিয়ন্ত্রিত তৃতীয় শ্রেণির নৌপথে অন্তর্ভুক্ত।
 - 1.2 **নদীর প্রকার:** আড়াইনদীর উদয় নদী থেকে উৎপন্ন।
 - 1.3 **প্রকারভেদ:** অধিনেত্রণের
- 1.2 নদীর উৎসস্থল/প্রবেশস্থল/পতিতস্থল:**

নদী/নিম্নোক্ত/আড়াই/নদী	উৎস	ইউনিয়ন	উপজেলা	জেলা	বিভাগ	আকাশ	অক্ষাংশ
উদয়/নদী/প্রবেশস্থল	করতোয়া নদী	শাকতপুর	সেখেরা মজিবর	খেচিগঞ্জ	পশ্চিম	১০° ১' ০০" N	৮৮° ৪৮' ১০.৬২"
পতিতস্থল	গুহামি নদী	১০ই ইউনিয়ন (আড়াই)	শাকতপুর	আড়াই	রাজশাহী	২৪° ২২' ১০.১৪"	৮৯° ১৪' ১৪.১৪"
- 1.3 প্রান্তিক পতিত এলাকা:**

উপজেলা	জেলা	বিভাগ
করতোয়া, খেচিগঞ্জ, নিম্নোক্তপুর এবং উদয়নগর, আনন্দপুর	নিম্নোক্তপুর	পশ্চিম
খেচিগঞ্জ	পশ্চিম	পশ্চিম
আড়াই, গুহামি নদী, পতিতনগর, অধিনেত্রণ, ময়দানপুর, আড়াই	আড়াই	রাজশাহী
গুহামি, জলসঙ্গম	আড়াই	রাজশাহী
আড়াই, গুহামি নদী	আড়াই	রাজশাহী
- 1.4 নদীর উৎসস্থল/প্রবেশস্থল/পতিতস্থল:**

উৎসস্থল/প্রবেশস্থল/পতিতস্থল	উৎস	ইউনিয়ন	উপজেলা	জেলা	বিভাগ
উদয়/নদী/প্রবেশস্থল	করতোয়া নদী	শাকতপুর	সেখেরা মজিবর	খেচিগঞ্জ	পশ্চিম
পতিতস্থল	গুহামি নদী	১০ই ইউনিয়ন (আড়াই)	শাকতপুর	আড়াই	রাজশাহী
- 1.5 নদীর উৎসস্থল/প্রবেশস্থল/পতিতস্থল:**

উৎসস্থল/প্রবেশস্থল/পতিতস্থল	উৎস	ইউনিয়ন	উপজেলা	জেলা	বিভাগ
উদয়/নদী/প্রবেশস্থল	করতোয়া নদী	শাকতপুর	সেখেরা মজিবর	খেচিগঞ্জ	পশ্চিম
পতিতস্থল	গুহামি নদী	১০ই ইউনিয়ন (আড়াই)	শাকতপুর	আড়াই	রাজশাহী

Figure 4.7: Print River Information Report

5. Hydrograph

Select Hydrograph from the **main menu**, then a new page will load with some parameters (Figure 5.1).

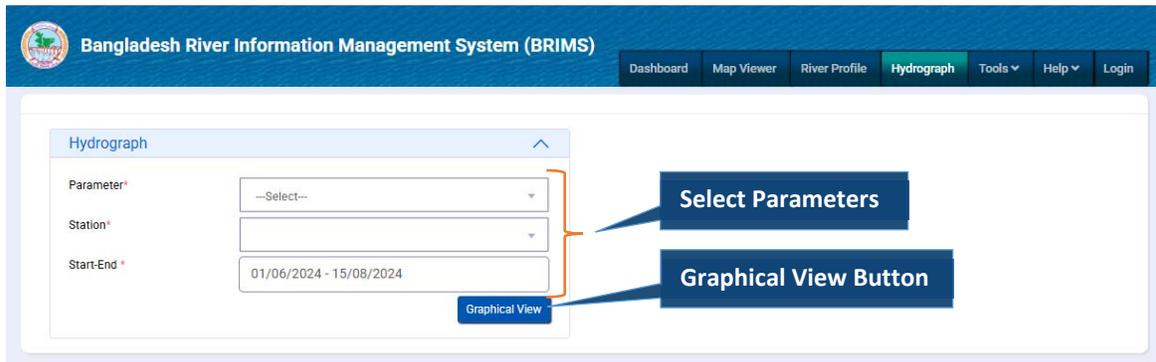


Figure 5.1: Hydrograph page with parameters.

Select a parameter, station and start-end dates then **click** on the **Graphic View** button to view graphical data (Figure 5.2).

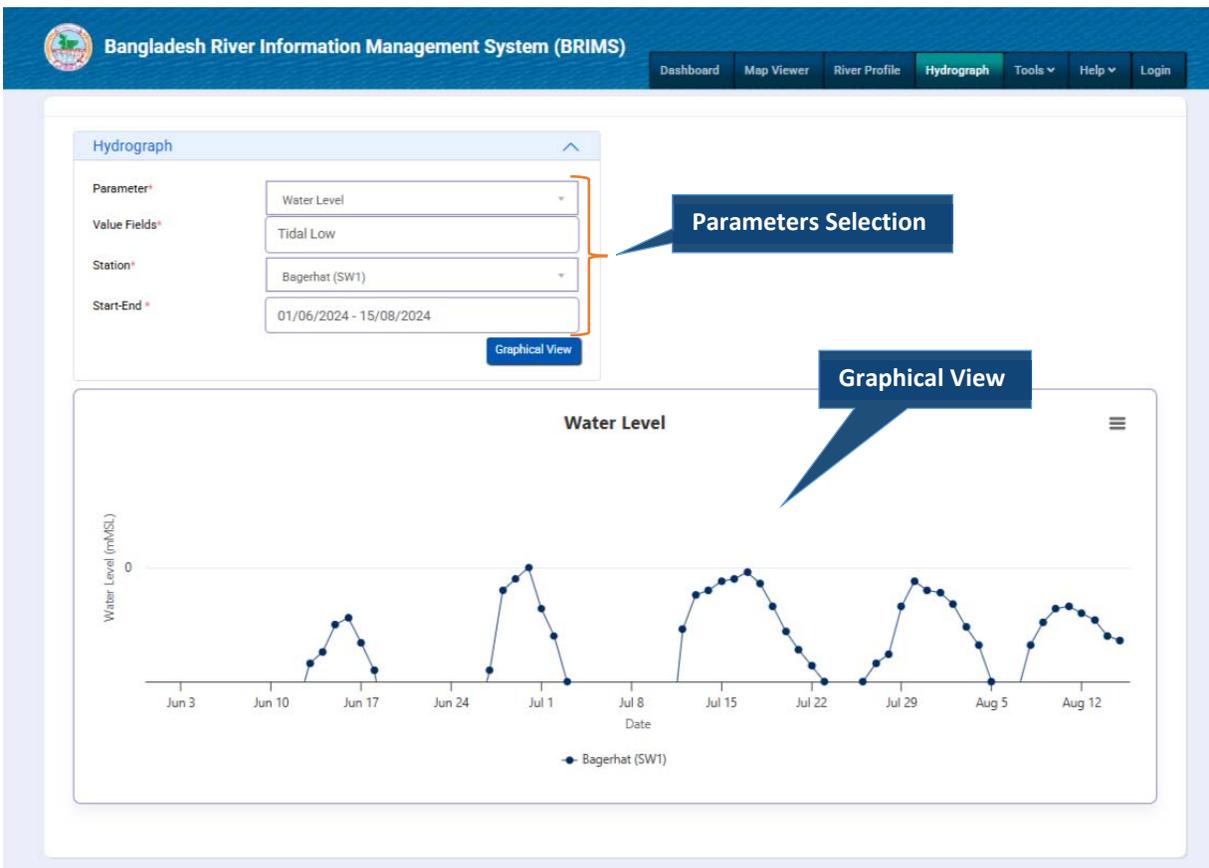
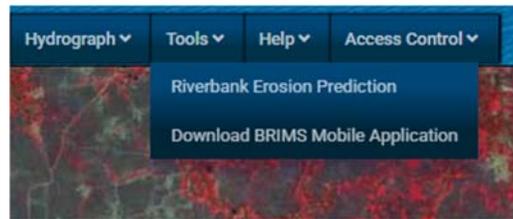


Figure 5.2: Hydrographic Data.

6. Tools

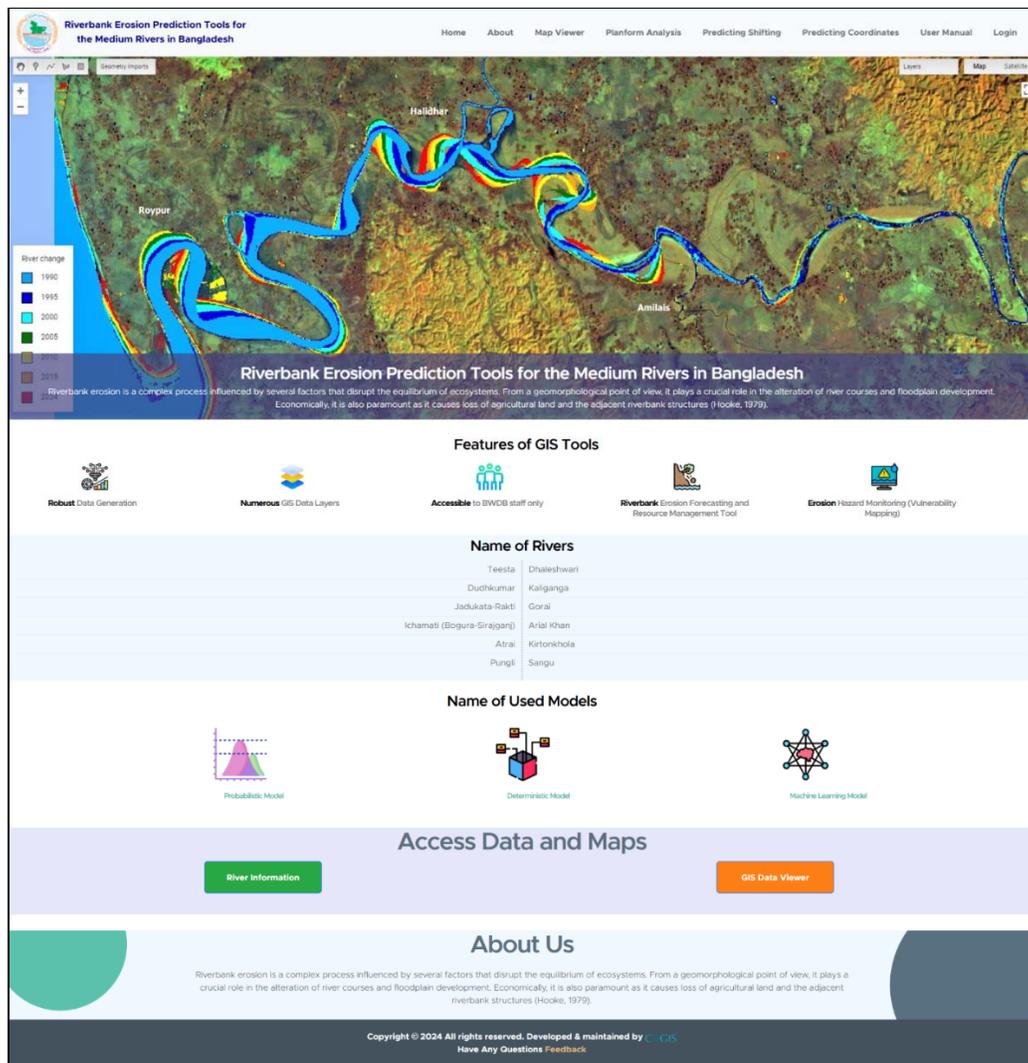
There are two options under the Tools menu. These are:

- (1) Riverbank Erosion Prediction
- (2) Download BRIMS Mobile Application



6.1 Riverbank Erosion Prediction

Select **Riverbank Erosion Prediction Tools** from the **Tools** menu, then a new page will load in another tab, which is “**Riverbank Erosion Prediction Tools for the Medium Rivers in Bangladesh**” (Figure 6.1).



Riverbank Erosion Prediction Tools for the Medium Rivers in Bangladesh

Home About Map Viewer Platform Analysis Predicting Shifting Predicting Coordinates User Manual Login

Geometry Imports Layers Map Satellite

River change

- 1990
- 1995
- 2000
- 2005
- 2015

Riverbank Erosion Prediction Tools for the Medium Rivers in Bangladesh

Riverbank erosion is a complex process influenced by several factors that disrupt the equilibrium of ecosystems. From a geomorphological point of view, it plays a crucial role in the alteration of river courses and floodplain development. Economically, it is also paramount as it causes loss of agricultural land and the adjacent riverbank structures (Hooke, 1979).

Features of GIS Tools

- Robust Data Generation
- Numerous GIS Data Layers
- Accessible to BWDB staff only
- Riverbank Erosion Forecasting and Resource Management Tool
- Erosion Hazard Monitoring (Vulnerability Mapping)

Name of Rivers

Teesta	Dhaleshwari
Dudhkumar	Kalganga
Jadukata-Rakti	Gorai
Ichamati (Bogura-Sirajganj)	Arial Khan
Atrai	Kirtankhola
Pungli	Sangu

Name of Used Models

- Probabilistic Model
- Deterministic Model
- Machine Learning Model

Access Data and Maps

River Information GIS Data Viewer

About Us

Riverbank erosion is a complex process influenced by several factors that disrupt the equilibrium of ecosystems. From a geomorphological point of view, it plays a crucial role in the alteration of river courses and floodplain development. Economically, it is also paramount as it causes loss of agricultural land and the adjacent riverbank structures (Hooke, 1979).

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Figure 6.1: Riverbank Erosion Prediction Tool.

6.2 Download BRIMS Mobile Application

Click on the “**Download BRIMS Mobile Application**” option and then the **BRIMSApp.apk** file will be downloaded, which is an installation app file to install it to an android phone/tab to access the Bangladesh River Information Management System (BRIMS) web application.

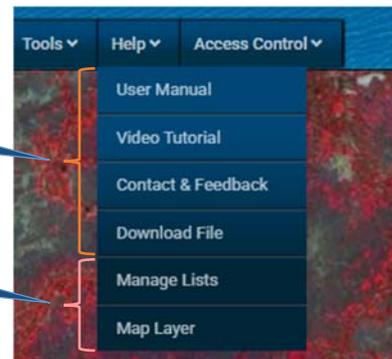
7. Help

There are six sub-menus under the main menu Help. These are:

- (1) User Manual
- (2) Video Tutorial
- (3) Contact & Feedback
- (4) Download File
- (5) Manage Lists
- (6) Map Layer

Visible before login

Visible after login



7.1 User Manual

To view the user manual, **Click** on the **User Manual** option from the Menu list. The user manual will be open as a PDF file so that, the users can read or download it anytime (Figure 7.2).



Figure 7.1: Select User Manual



Figure 7.2: User Manual

7.2 Video Tutorial

A video tutorial has also been uploaded for users to easy understanding. To open the video, **click** the **Video Tutorial** option from the Menu list (Figure 7.3).

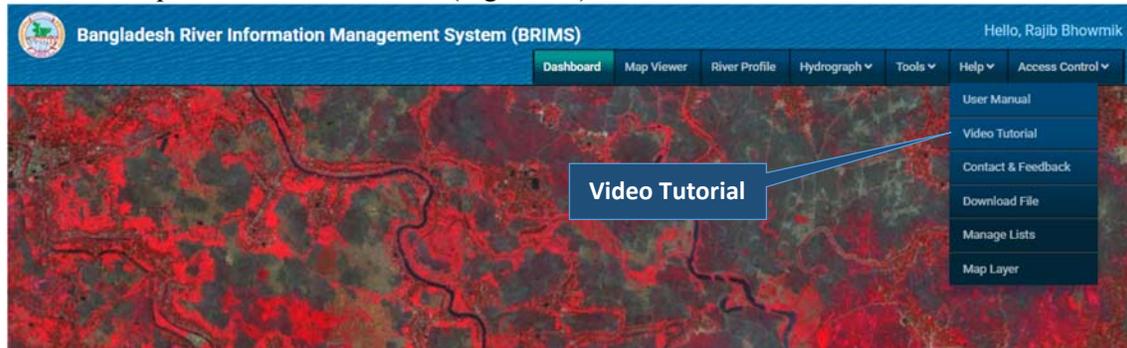


Figure 7.3: Select Video Tutorial

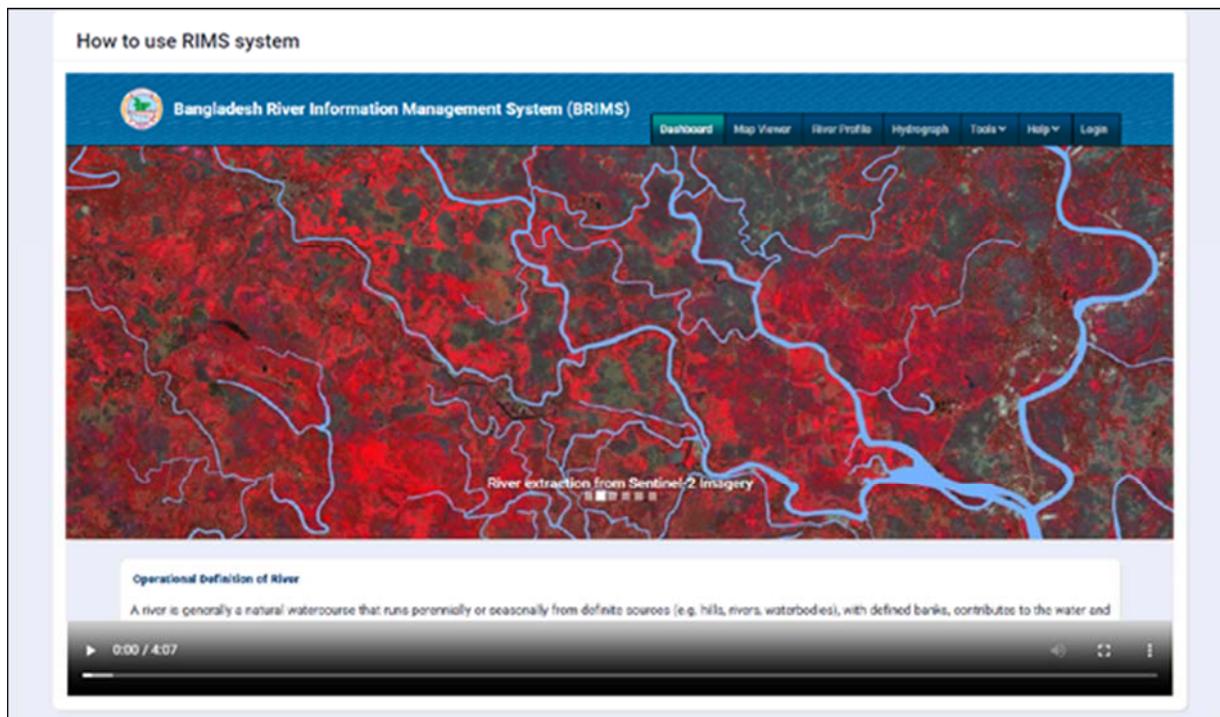


Figure 7.4: Video Tutorial

7.3 Contact and Feedback

Users can contact the RIMS team and submit feedback by clicking "Contact and Feedback" in the Menu List (Figure 7.5).

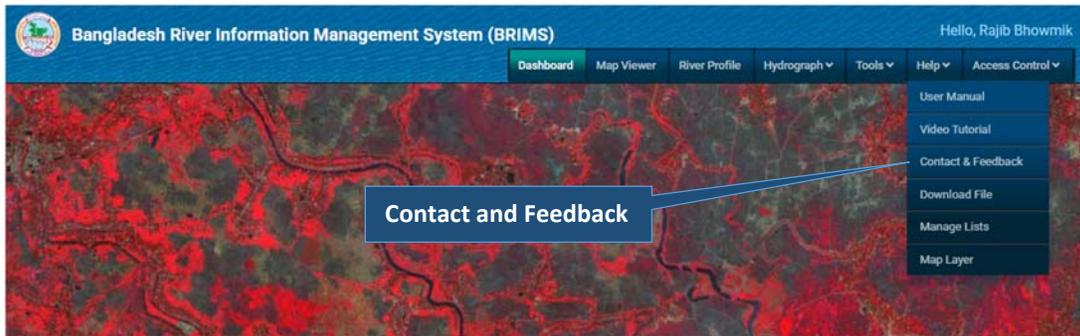


Figure 7.5: Select Contact and Feedback

- Step 1:** Fill in the User Information Field.
- Step 2:** Fill in the Comment Field.
- Step 3:** Click Submit (Figure 7.6).

Figure 7.6: Contact and Feedback Form

7.4 Download File

There is a shape file that user can download. Only an authorized user can download the file. If any unauthorized user click on the Download File option, it will show Access Denied message (Figure 7.7).



Figure 7.7: Access Denied message

When any authorized user click on the Download File option, then it takes to the download page (Figure 7.8). *Click* on the **Export** button to **download** the shape file.

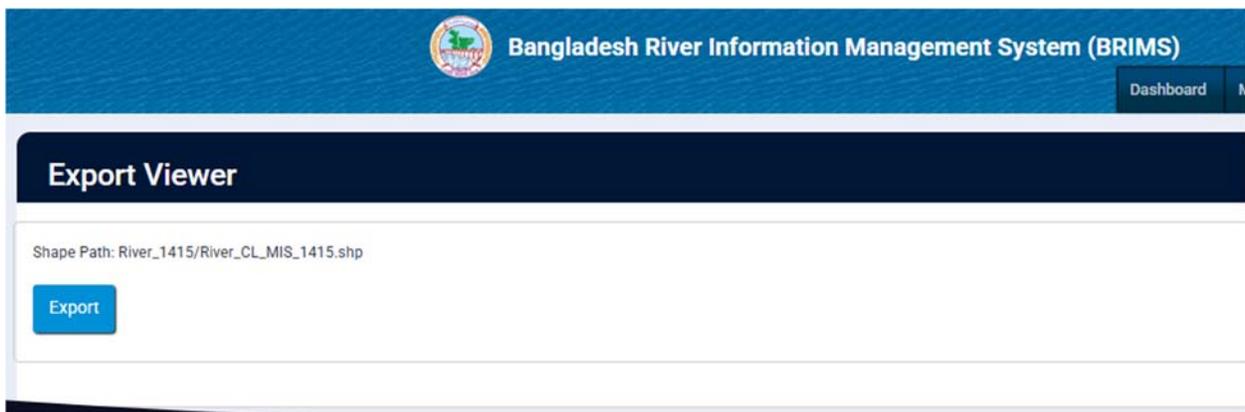


Figure 7.8: Download File

7.5 Manage List

An authorized user can open the **Manage List** page from the sub-menu list (Figure: 7.9). There are two different lists, that user can manage like add, update and delete item(s) (Figure: 7.10, 7.11). These two lists are:

- (1) Stations
- (2) Indicators

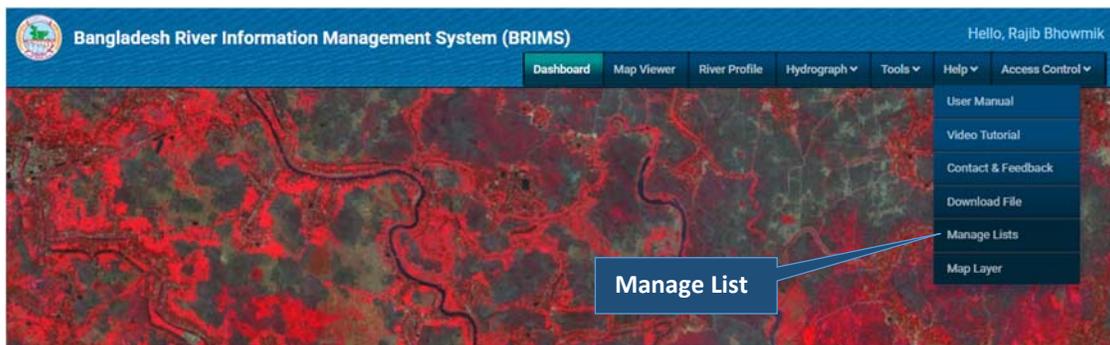


Figure: 7.9: Manage List selection

Bangladesh River Information Management System (BRIMS) Hello, Rajib Bhowmik

Dashboard | Map Viewer | River Profile | Hydrograph | Tools | Help | Access Control

Manage List Information

Home / Others / Manage List Information

Station List Management

Station Type: **Dropdown List** (-- Select --)

Station Name (in Bangla): **Input box**

Station Name (in English):

Station ID:

River ID:

Latitude:

Longitude:

Add Button (Add)

Search box (Search)

Station List

Show 10 entries

SN	Station Type	Station Name (in Bangla)	Station Name (in English)	Station ID	River ID	Latitude	Longitude	
1	Non-tidal Water Level	মুসলিমপুর	Muslimpur	333	433	25.14	91.39	Edit Button Delete Button
2	Non-tidal Water Level	দুলুড়া	Dulura	333A	433	25.17	91.39	Edit Button Delete Button
3	Non-tidal Water Level	মিয়ার বাজার	Miar Bazar	334	802	25.17	91.25	Edit Button Delete Button

Figure: 7.10: Manage Station List

Indicator List Management

Indicator Name (in English): **Input box**

Add Button (Add)

Show 10 entries

Search box (Search)

Indicator Name (in English)	
pH	Edit Button Delete Button
DO	Edit Button Delete Button
TDS	Edit Button Delete Button
TSS	Edit Button Delete Button

Showing 0 to 0 of 0 entries Previous Next

Figure: 7.11: Manage Indicator List

7.6 Map Layer

In the Map Layer page, it contains the information of all the Map Layers that is used in the BRIMS application using ArcGIS Portal. *Select Map Layer* from the **Help** menu (Figure: 7.12).



Figure: 7.12: Map Layer selection

The Map Layer page is looks like below (Figure: 7.13):

The screenshot shows the 'Map Layer List' page. It features a table with four columns: Layer ID, Layer Name, Layer Path, Layer Label, and Action. There are four rows of data. The 'Action' column contains 'Edit' buttons for each row. Above the table, there is a search bar and a 'Show 10 entries' dropdown.

Layer ID	Layer Name	Layer Path	Layer Label	Action
1	River (Line Type)	BRIMSAdmin_GEO_GIS_USER_RIVER_1415/MapServer/0	rname_en	Edit
2	Catchment	BRIMSAdmin_Catchment/MapServer/0	CATCHMENT	Edit
3	Merge Catchment	BRIMSAdmin_Catchment/MapServer/0	CATCHMENT	Edit
4	Sub - Catchment	BRIMSAdmin_Catchment_Individual/MapServer/0	CATCHMENT	Edit

Figure: 7.13: Map Layer Page

If the user needs to update any map layer information, *click* on the **Edit** button from the right-side column of the related map layer row. Then a pop-up window will be viewed and there will be all the information of the selected map layer (Figure: 7.14). Then update information and finally, *click* on the **Update** button.

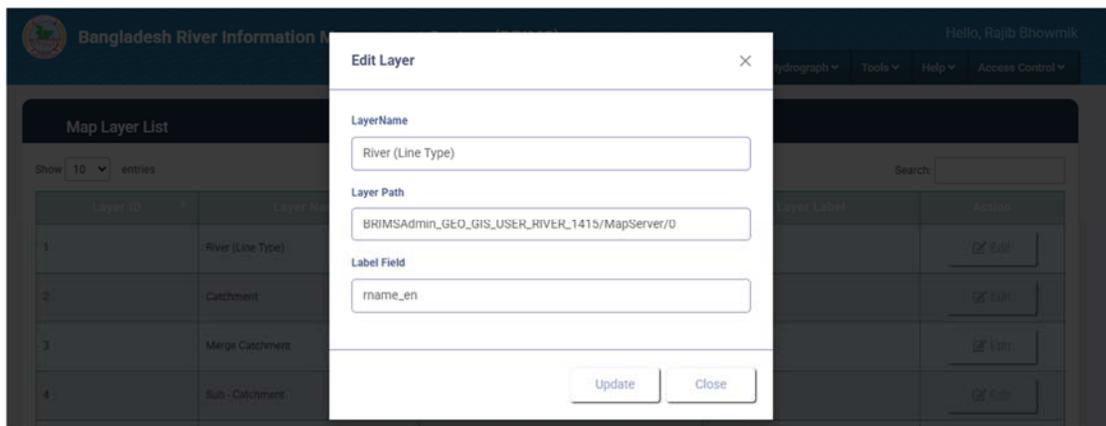


Figure: 7.14: Map Layer Information

8. Access Control

8.1 Add new User / Registration

An unregistered user can not register here. Only an Administrator can add new user. To do so, an administrator must login to the application. Then under the Access Control main menu, select Register.

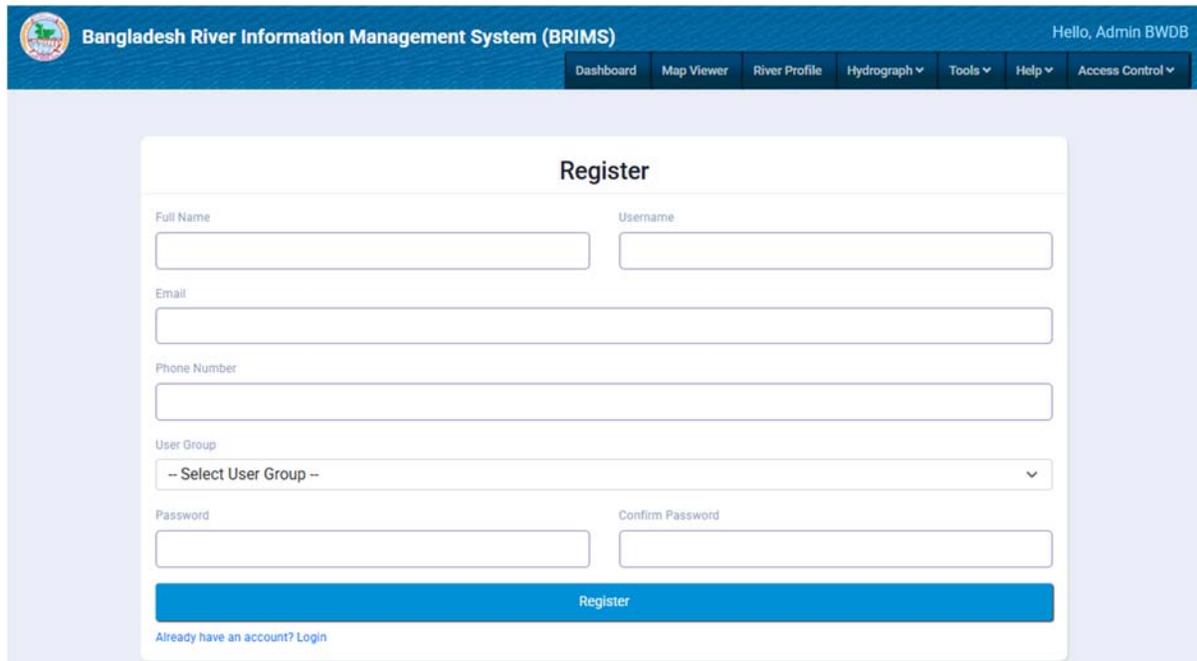


Figure: 8.1: Change Password Page

Now, fill the required information including Username, Email, User Group and Password then click on the Register button for adding a new user successfully.

8.2 Change Password

To change password, an authorized user must have logged in, then *click* on the **Change Password** from the main menu Access Control. Then enter your current, new and confirmed new passwords then *click* on the **Change Password** button (Figure 8.3).

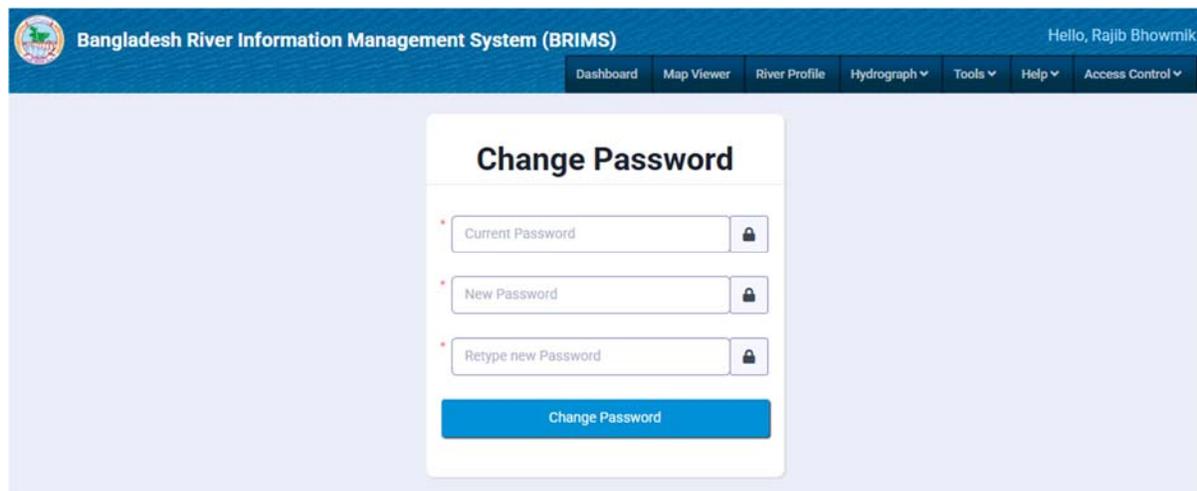


Figure: 8.2: Change Password Page

The End