User Manual
Web Application

of

Technical Study for Mapping of Potential Greenbelt Zone in the Coastal Regions of Bangladesh

under

Climate Resilient Participatory Afforestation and Reforestation Project

Bangladesh Forest Department

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Project Director

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Acronyms and Abbreviation

ASP	Active Server Page
BFD	Bangladesh Forest Department
CRPARP	Climate Resilient Participatory Afforestation and Reforestation Project
CLR	Common Language Runtime
DSS	Decision Support System
GIS	Geographic Information System
HTML	Hyper Text Mark-up Language
ODBC	Open Database Connectivity
OS	Operating System
SQL	Structured Query Language
URL	Uniform Resource Locator
VDS	Virtual Dedicated Server

Chapter 1: Overview of the System

1.1 Forward

BFD desires to delineate potential plantation areas/belt that can be developed as a Greenbelt to reduce the intensity of damage from extreme climate events like cyclones that also matches CRPARP objectives. BFD also deems necessary to develop a Decision Support System (DSS) that will assist decision makers to perform investment planning needed to create this Greenbelt. A huge number of geo-spatial data and information will be collected as well as generated under this project. All these information and the analysed output of DSS will be incorporated into and visualized by this Web Portal.

A comprehensive database system and a BFD portal is required to support the planners in participatory and interactive planning process for ensuring adaptive management of Green Belt. The overall objective of the knowledge portal is to develop a common and inclusive database on water, land and related natural resources as well as collected and generated knowledgebase information in support of the preparation, implementation and dissemination of the Green Belt planning purpose.

Web based BFD has been developed using ASP.Net and ASP Map tool as front end and PostgreSQL as back end. Dot Net Framework v4.5 has been used as the base platform in the core development. The web version of ASP Map tool developed by VDS Technology has been included with it. The key features of the development environment are described below.

1.2 Web

The Web is a system of interlinked documents that runs over the Internet. With a Web browser, a user views Web pages that may contain text, images, and other multimedia and navigates between them using hyperlinks.

Advantage:

- Make Database available to all internal users through intranet.
- No need to install on every user's machine
- Make all tools available on a single page
- Centralized control

1.3 Application Platform

A Windows based application platform should have following two characteristics:

- Capable of being run on different windows servers
- Should provide output for display by any Internet browser (Google Chrome, Netscape, Mozilla, Internet Explorer, Opera etc.)

1.4 Tools Used

1.4.1 ASP.NET

ASP.NET is a web application framework developed by Microsoft to allow programmers to build dynamic web sites, web applications and web services. It was first released in January 2002 with version 1.0 of the .NET Framework, and is the successor to Microsoft's Active Server Pages (ASP) technology. ASP.NET is built on the Common Language Runtime (CLR), allowing programmers to write ASP.NET code using any supported .NET language.

Important Features

- Easy Programming Model: ASP.NET makes building real world applications dramatically easier. Displaying data, validating user input, and uploading files are all amazingly easy.
- Flexible Language Options: ASP.NET now supports more than 25 .NET languages (built-in support for VB.NET, C#, and JScript.NET), giving you unprecedented flexibility in your choice of language.
- Rich Class Framework: Application features that used to be hard to implement, or required a 3rd-party component, can now be added in just a few lines of code using the .NET Framework. The .NET Framework offers over 4500 classes that encapsulate rich functionality like XML, data access, file upload, regular expressions, image generation, performance monitoring and logging, transactions, message queuing, SMTP mail, and much more. With Improved Performance and Scalability ASP.NET lets you use serve more users with the same hardware.
- Compiled execution: ASP.NET will automatically detect any changes, dynamically compile the files if needed, and store the compiled results to reuse for subsequent requests. Dynamic compilation ensures that your application is always up to date, and compiled execution makes it fast.
- Rich output caching: ASP.NET output caching can dramatically improve the performance and scalability of your application. When output caching is enabled on a page, ASP.NET executes the page just once, and saves the result in memory in addition to sending it to the user. When another user requests the same page, ASP.NET serves the cached result from memory without re-executing the page. Output caching is configurable, and can be used to cache individual regions or an entire page.
- Enhanced Reliability: ASP.NET ensures that your application is always available to your users.
- Memory Leak, Deadlock and Crash Protection: ASP.NET automatically detects and recovers from errors like deadlocks and memory leaks to ensure your application is always available to your users.
- Easy Deployment: ASP.NET takes the pain out of deploying server applications. "No touch" application deployment. ASP.NET dramatically simplifies installation of your application. With ASP.NET, you can deploy an entire application as easily as an HTML page; just copy it to the server.
- Dynamic update of running application: ASP.NET now lets you update compiled components without restarting the web server. In the past with classic COM components, the developer would have to restart the web server each time he/she deployed an update. With ASP.NET, you simply copy the component over the

existing DLL; ASP.NET will automatically detect the change and start using the new code.

- XML Web Services: XML Web services allow applications to communicate and share data over the Internet, regardless of operating system or programming language.
- Web-servers support: Microsoft IIS and others.
- Multiple databases support: Dbase, Informix, Microsoft SQL Server, mySQL, Oracle, PostgreSQL, Sybase, and ODBC, etc.

Web address: http://www.asp.net/

1.4.2 ASP Map

ASP Map is a set of high-performance, Web mapping components and controls for embedding maps in ASP.NET and ASP.NET AJAX applications. ASP Map gives the ability to generate maps, drill-down capability, thematic mapping, routing, vehicle tracking and other features that - generated on the server - will make the maps fully interactive on the client-side.

Important Features

- Multiple map layers.
- Dynamic map layers.
- Pan and zoom through map layers.
- Map caching.
- Five Web Forms controls included: Map control, Legend control, MapTool Button control, Zoom Bar control, and Wms Service control.
- Scale dependent layer display.
- Client-side JavaScript API.
- Support for ASP.NET AJAX.
- Support for WMS (Web Map Services).
- Support for Google© Maps and Microsoft© Virtual Earth.

Web Address: http://www.vdstech.com/aspmap.htm

1.4.3 PostgreSQL

PostgreSQL is a powerful, open source object-relational database system. It has more than 15 years of active development and a proven architecture that has earned it a strong reputation for reliability, data integrity, and correctness. It runs on all major operating systems, including Linux, UNIX (AIX, BSD, HP-UX, SGI IRIX, macOS, Solaris, Tru64), and Windows.

Important Features

- More profitable business models with wide-scale deployment.
- No possibility of being audited for license compliance at any stage.

- Flexibility to do concept research and trial deployments without needing to include additional licensing costs.
- Have much lower maintenance and tuning requirements than the leading proprietary databases, yet still retain all of the features, stability, and performance.
- PostgreSQL is available for almost every brand of Unix (34 platforms with the latest stable release), and Windows compatibility is available via the Cygwin framework. Native Windows compatibility is also available with version 8.0 and above.
- PostgreSQL use a multiple row data storage strategy called MVCC to make PostgreSQL extremely responsive in high volume environments.
- There are many high-quality GUI Tools available for PostgreSQL from both open source developers and commercial providers.

1.5 BFD Web portal Overview

The URL of BFD web portal is http://202.53.173.179/greenb. Click on the URL or type the URL at address bar of your browser and press enter. The home page will appear showing the following screen.

Figure 1.1: Web Portal

The Greenbelt Database has four Modules: Data Viewer, Map Explorer, Cost Benefit Analysis and Data Entry.

Data Viewer views the different tabular data layers. Map Explorer has been used for overlaying different GIS layers. Cost Benefit Analysis has been use for analytical/beneficial cost analysis for potential Greenbelt and Data Entry module has been used to capture and update data required for cost benefit analysis information.

Chapter 2: Data Viewer

2.1 Overview

This tool has been designed to display Tabular data. It provides facilities to view information in window and click the desired table from right panel for viewing tabular data layer.

2.2 Data Viewer

Figure 2.1: Data Viewer

To view the Tabular Data follow the following instructions:

Figure 2.2: Tabular Data

1. Select the desired layer by clicking.
2. Then the data will be displayed accordingly.
3. Click Home to return to the main page.

Chapter 3: Map Explorer

3.1 Overview

This tool has been designed to display spatial and attributes data. Zoom in, zoom out, pan, super imposed and other standard facilities of spatial data viewer has been incorporated into the tool. It provides facilities to view information window and attribute information of the data layer.

This is the main component of the portal. It displays spatial data such as the Erosion, Accretion, Land Cover, Soil Salinity, Embankment, administrative boundaries etc. The Map Explorer interface contains two separate panels: Left Panel and Right Panel.

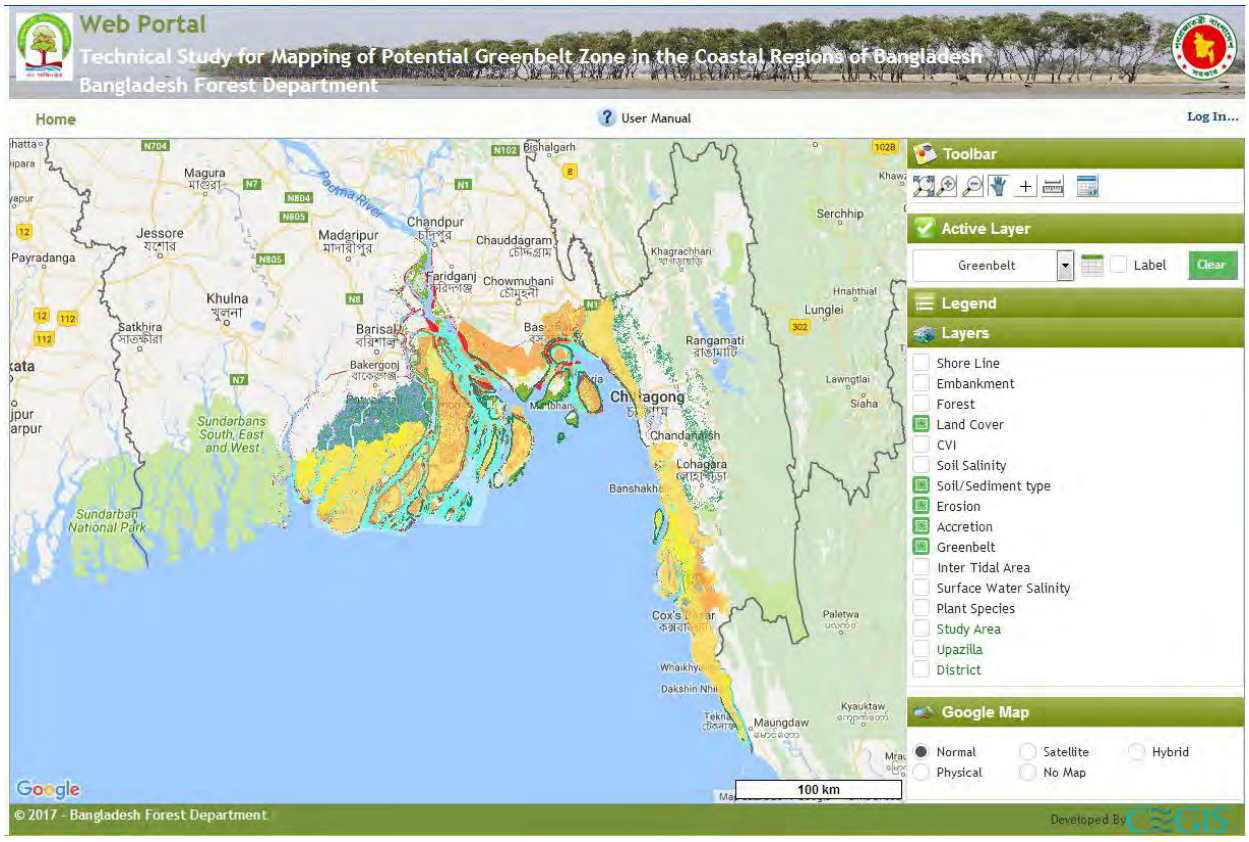


Figure 3.1: Map Explorer

3.1.1 Left Panel

This panel is used to display spatial data. Google Map can be viewed as background layer. Zoom in, zoom out, pan, super imposition and other standard facilities of a GIS tool are available here.

3.1.2 Right Panel

This panel contains Toolbar, Active Layers, Legend, Layers and Google Map.

Toolbar: This contains several standard map tool buttons used for applying different functions on the maps available in the Right Panel.

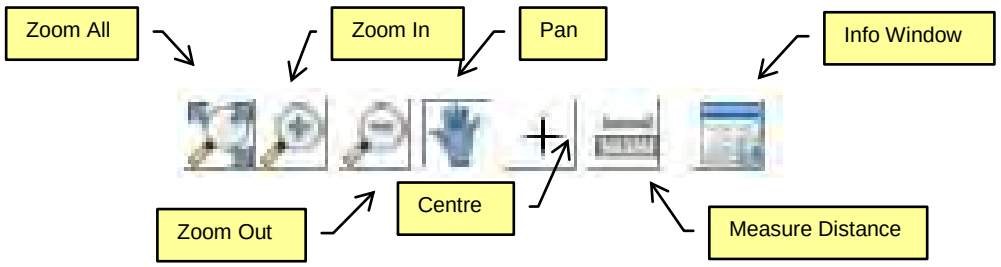


Figure 3.2: Map Toolbar

i. *Zoom All*: To display the layer to its fullest extent, click the Zoom All button.

ii. *Zoom In:* To zoom in the layer at the selected point, first click on the *Zoom In* button; then click on the Layer at the point where you want to zoom in.

iii. *Zoom Out:* To zoom out the layer at the selected point, first click on the *Zoom Out* button then click on the layer at the point where you want to zoom out.

iv. *Pan:* To pan the layer towards a direction, first click on the *Pan* Button ; then click on the *layer.*

v. *Center:* To Center the layer in the map, first click on the *Center* Button ; then click on the *layer.*

vi. *Measure Distance:* To measure distance from one location to another, first click on the *Measure*

vii. *Distance* button; then click on the points or polygon, which you want to measure distance.

viii. *Info Window:* This button displays the information of a particular point or polygon on the layer, click the Info Window button, then click on the point. It will display the information of the record described in the database of the point/polygon (enclosed area).

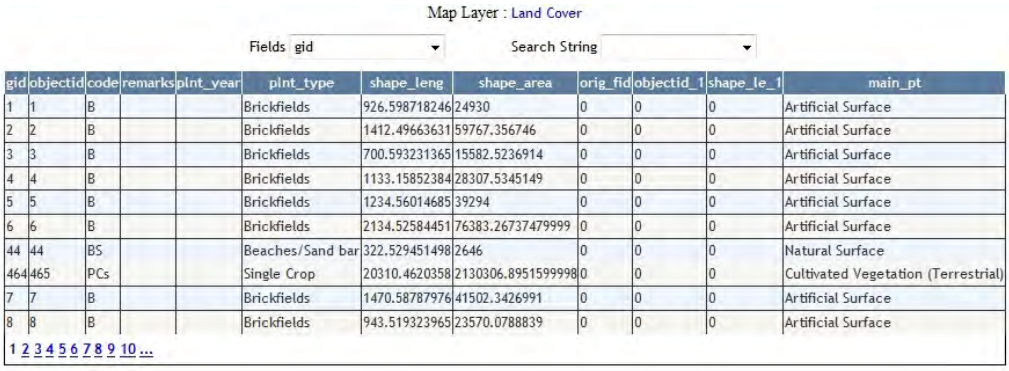
Active Layer: This dynamic dropdown list is used to make a particular layer active to display attribute information (Figure 3.4) by clicking button .

Figure 3.3: Active Layers

Click on Label button 

to make the Map Label visible/invisible. To remove all selected layers from Left Panel, click on 

button.



Map Layer : Land Cover

Fields gid Search String

gid	objectid	code	remarks	plnt_year	plnt_type	shape_leng	shape_area	orig_fid	objectid_1	shape_le_1	main_pt
1	1	B			Brickfields	926.598718246	24930	0	0	0	Artificial Surface
2	2	B			Brickfields	1412.49663631	59767.356746	0	0	0	Artificial Surface
3	3	B			Brickfields	700.593231365	15582.5236914	0	0	0	Artificial Surface
4	4	B			Brickfields	1133.15852384	28307.5345149	0	0	0	Artificial Surface
5	5	B			Brickfields	1234.56014685	39294	0	0	0	Artificial Surface
6	6	B			Brickfields	2134.52584451	76383.26737479999	0	0	0	Artificial Surface
44	44	BS			Beaches/Sand bar	322.529451498	2646	0	0	0	Natural Surface
464	465	PCs			Single Crop	20310.4620358	2130306.8951599998	0	0	0	Cultivated Vegetation (Terrestrial)
7	7	B			Brickfields	1470.58787976	41502.3426991	0	0	0	Artificial Surface
8	8	B			Brickfields	943.519323965	23570.0788839	0	0	0	Artificial Surface

1 2 3 4 5 6 7 8 9 10 ...

Figure 3.4: Attribute Table

Legend: Classified information of selected layers are available here. User can expand the information by clicking on it.

Figure 3.5: Legend

Layers: List of layers are available here. User needs to click on the corresponding cheek box to view the maps in the left panel.

Figure 3.6: Layers

List of administrative boundary and other basic layers are available here in Green colour labelled text. To view the basic layers, user needs to click on corresponding cheek box.

To see the spatial data in Map Viewer follow the following steps:

Figure 3.7: Map Explorer (Right Panel)

1. Click on the check box of a layer from the l*ayer* list.
2. Select basic layer if needed.
3. Selected layers will be displayed accordingly.

Google Map: Google Map can be seen as background layer by selecting type of Google Map.

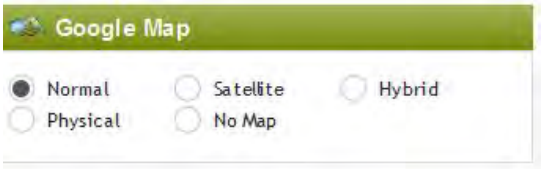


Figure 3.8: Google Map

To see the spatial data overlay with *Google Maps,* click on the corresponding radio button.

Chapter 4: Cost Benefit Analysis

4.1 Overview

This module helps users to perform cost benefit analysis by upazila required for investment planning. User can select cost or benefit components for a particular upazila under a particular forest division. Unit cost or unit benefit/economic value of the selected components extracted from the database and loaded into the interface. Area of the corresponding parameter is extracted from the spatial data stored in database. Cost or benefit of a particular parameter is calculated by multiplying the area with unit cost/benefit. Summation of the cost/benefit of all parameter gives total cost/net benefit.

4.2 Cost and Benefit Panel

These two panels allow user to select Cost and Benefit components to perform the cost benefit analysis.

To do the analysis user should follow following steps:

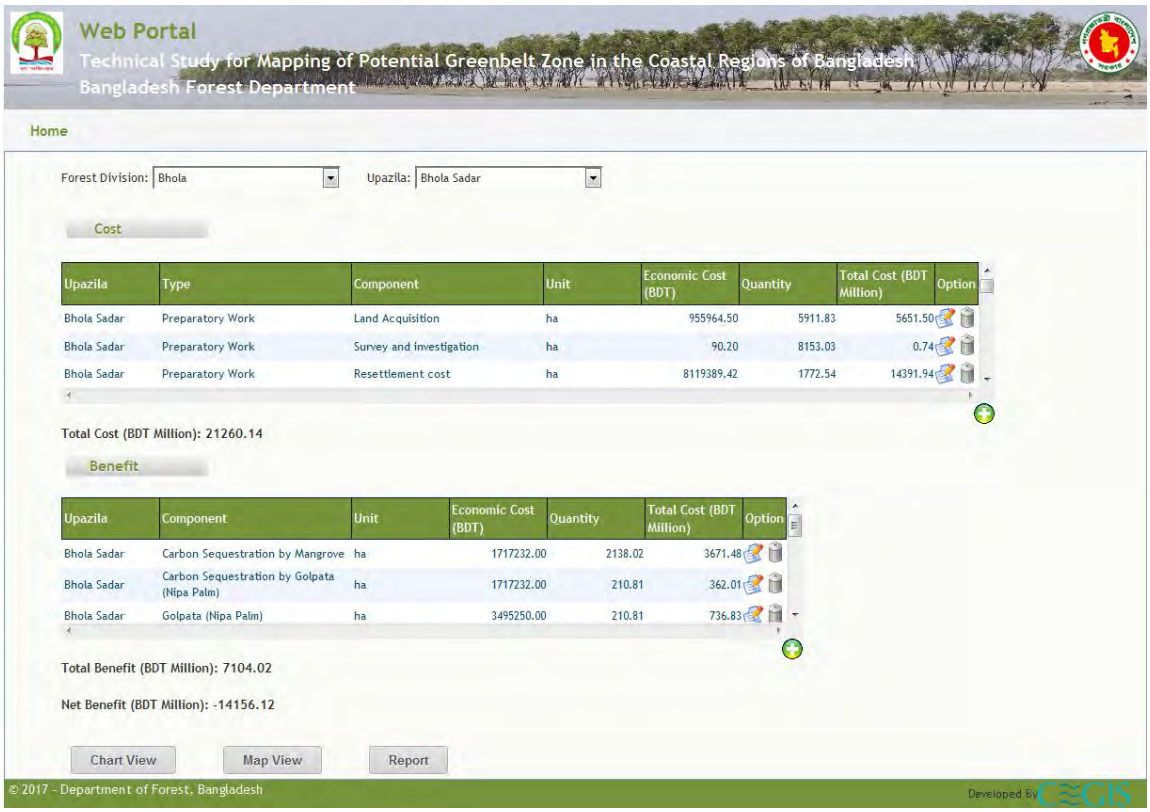


Figure 4.1: Cost Benefit Analysis

1. Select the desired Forest Division and Upazila from dropdown list
2. Click on  to enable the data entry mode of Cost or benefit component.
3. Select a particular cost type (only applicable for cost).
4. Select particular cost or benefit component.
5. Corresponding Unit, Economic Cost in BDT and Quantity (area) will be extracted from the database.
6. Change the value of Quantity (area) if needed.
7. Total Cost or Benefit in BDT Million will be automatically calculated.
8. Click on  to save the information.
9. For discard the data click on  .
10. For deleting and editing data in the table click on  and  respectively.

4.2.1 Chart View

This tool will help user to view the cost benefit analysis as chart or graph. To view the graph, do the following steps:

1. Clicking 

button will display the graph of total cost, total benefit and net benefit of a particular Forest Division and *Upazila* selected in the Cost and Benefit Panel.

2. Select *All Division from* Forest Division dropdown list to view graph of *all Upazilas* under all Divisions (Figure 4.2).

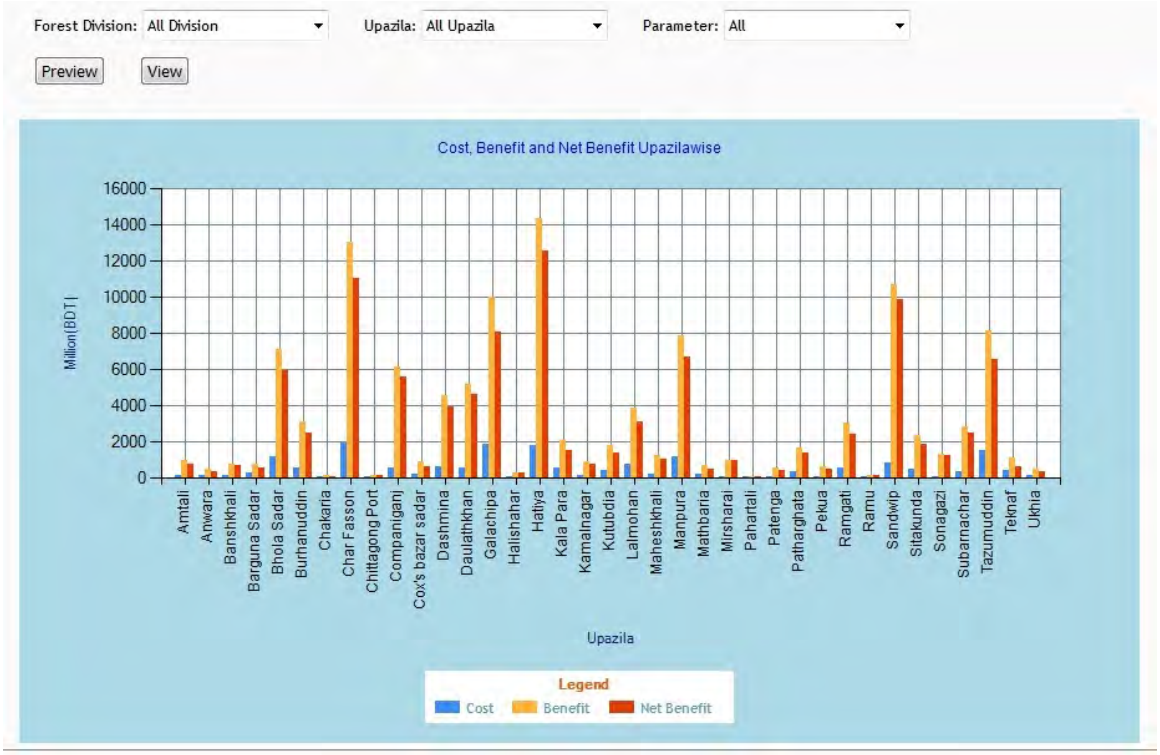


Figure 4.2: Chart View (All Division & All Upazila)

3. Select a particular Division such *Bhola* from Forest Division dropdown list and select *All Upazila* from Upazila dropdown list to view graph of all Upazilas under selected Division (Figure 4.3).

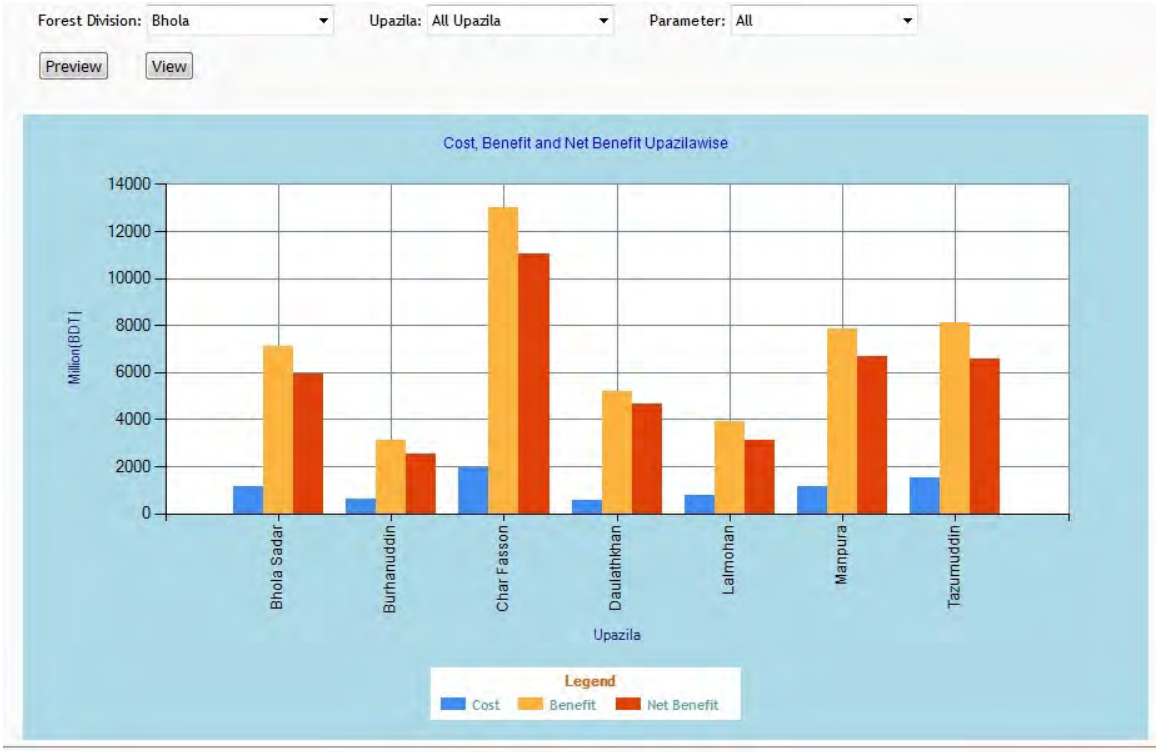


Figure 4.3: Chart View (Bhola & All Upazila)

4. In order to view graph for a particular Upazila, Select a Division such *Bhola* from Forest Division dropdown list and select Upazila such as *Bhola Sadar* from Upazila dropdown list (Figure 4.4).

Figure 4.4: Chart View (Bhola & Bhola Sadar)

5. The graph shows Cost, Benefit and Net Benefit by default. In order to view the graph for a particular parameter, select the corresponding parameter from the Parameter dropdown list (Figure 4.5).

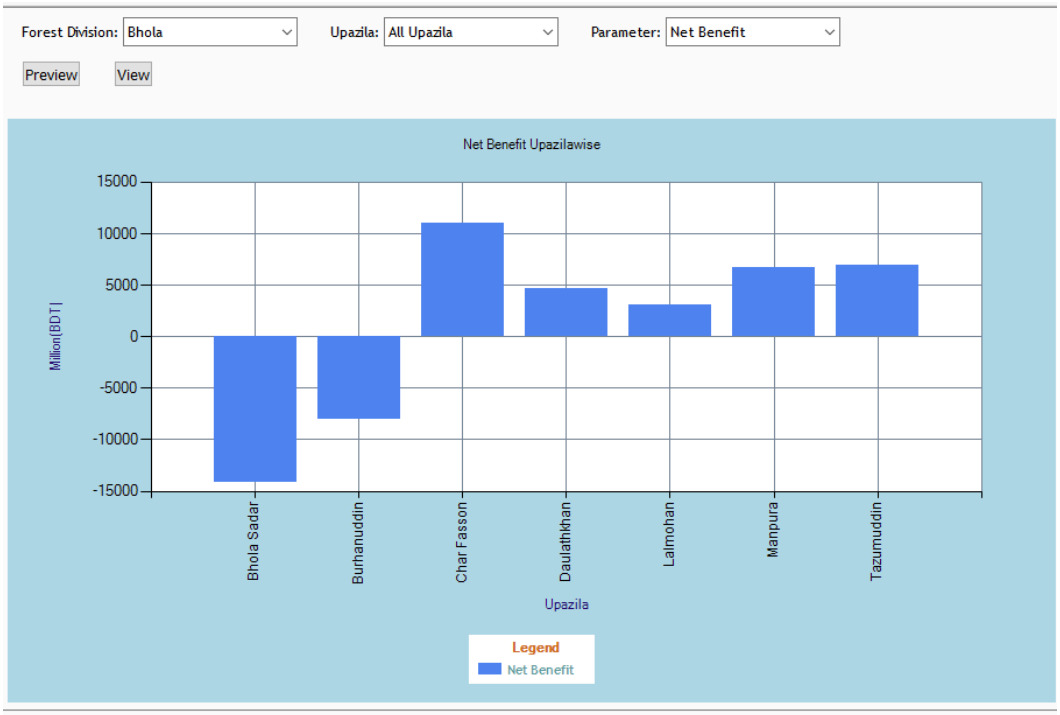


Figure 4.5: Chart View (Net Benefit)

6. After displaying, Chart can be previewed using Preview button and can be downloaded as Pdf.

7. To view the graph again, click View button.

4.2.2 Map View

This tool will help user to view the cost benefit analysis as in Map. To view the Map, do the following steps:

1. Clicking Map View button will display the Map of total cost (as default) required for a particular Forest Division and Upazila selected in the Cost and Benefit Panel.

2. Select *All Division* from Forest Division dropdown list to view map of *All Upazilas* under all Divisions (Figure 4.6).

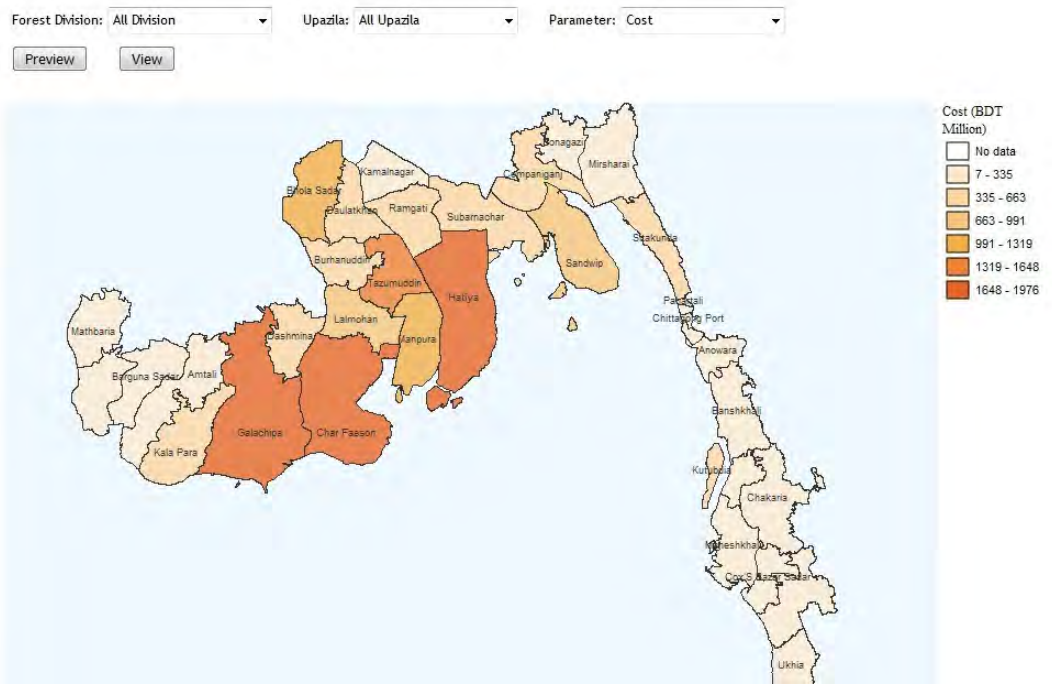


Figure 4.6: Map View (All Division & All Upazila)

3. Select a particular Division such *Bhola* from Forest Division dropdown list and select *All Upazila* from Upazila dropdown list to view map of all Upazilas under selected Division (Figure 4.7).

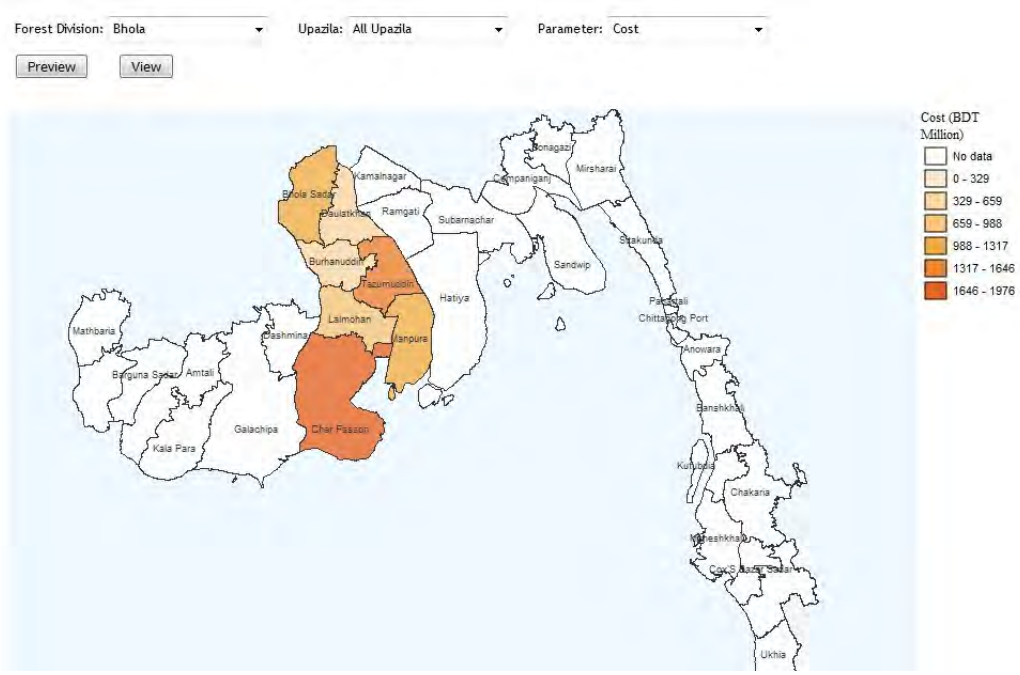


Figure 4.7: Map View (Bhola & All Upazila)

4. In order to view map for a particular Upazila, Select a Division such *Bhola* from Forest Division dropdown list and select Upazila such as *Bhola Sadar* from Upazila dropdown list (Figure 4.8).

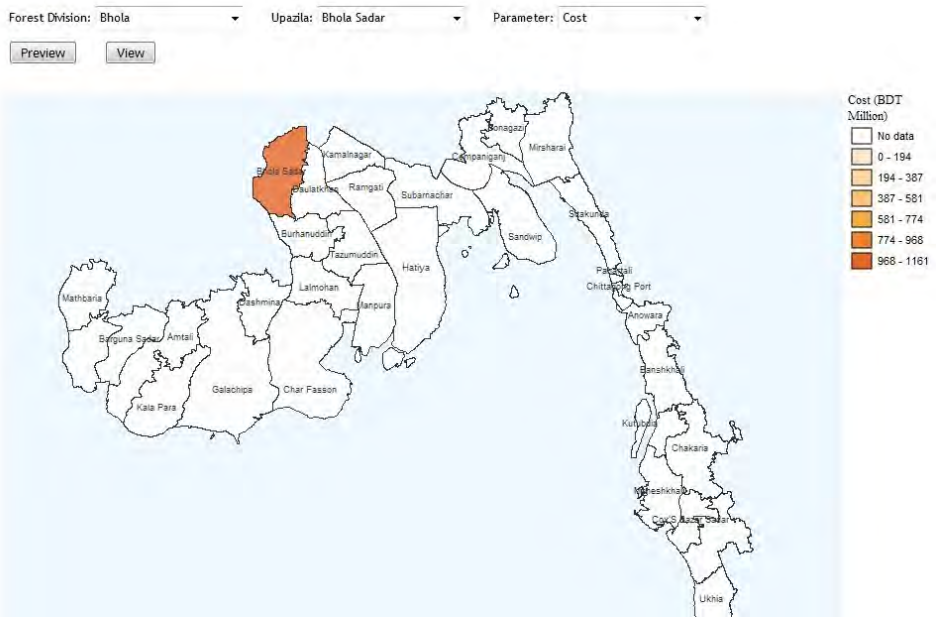


Figure 4.8: Map View (Bhola & Bhola Sadar)

5. The map shows Cost by default. In order to view the map for a particular parameter, select the corresponding parameter from the Parameter dropdown list (Figure 4.9).

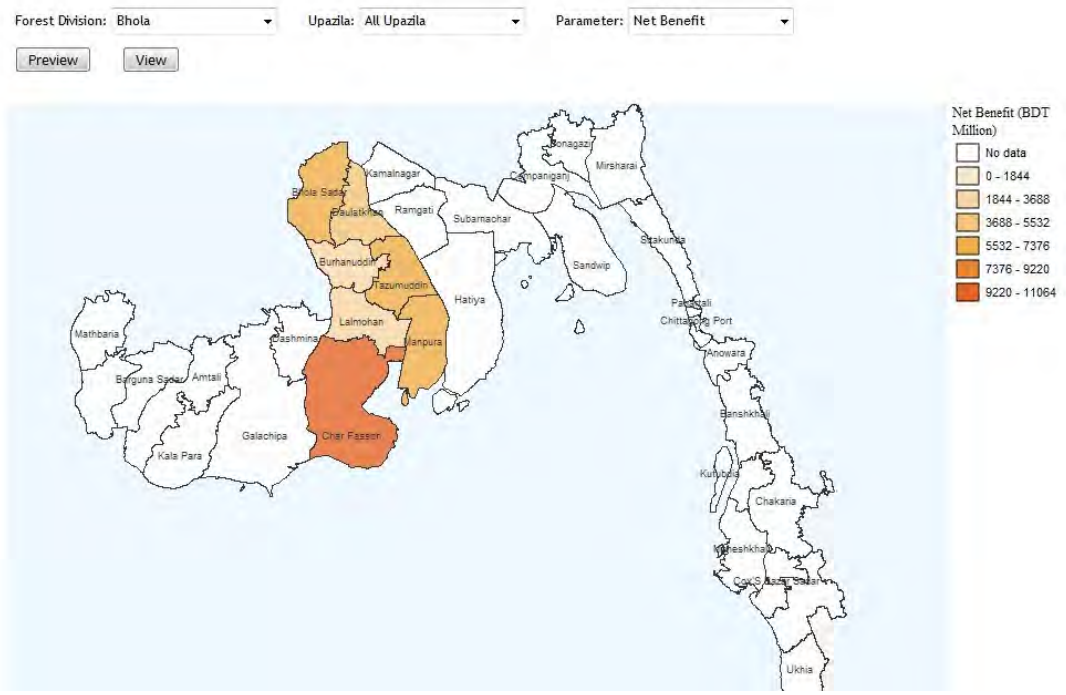


Figure 4.9: Map View (Net Benefit)

6. After displaying, Map can be previewed using Preview button and can be downloaded as Pdf.

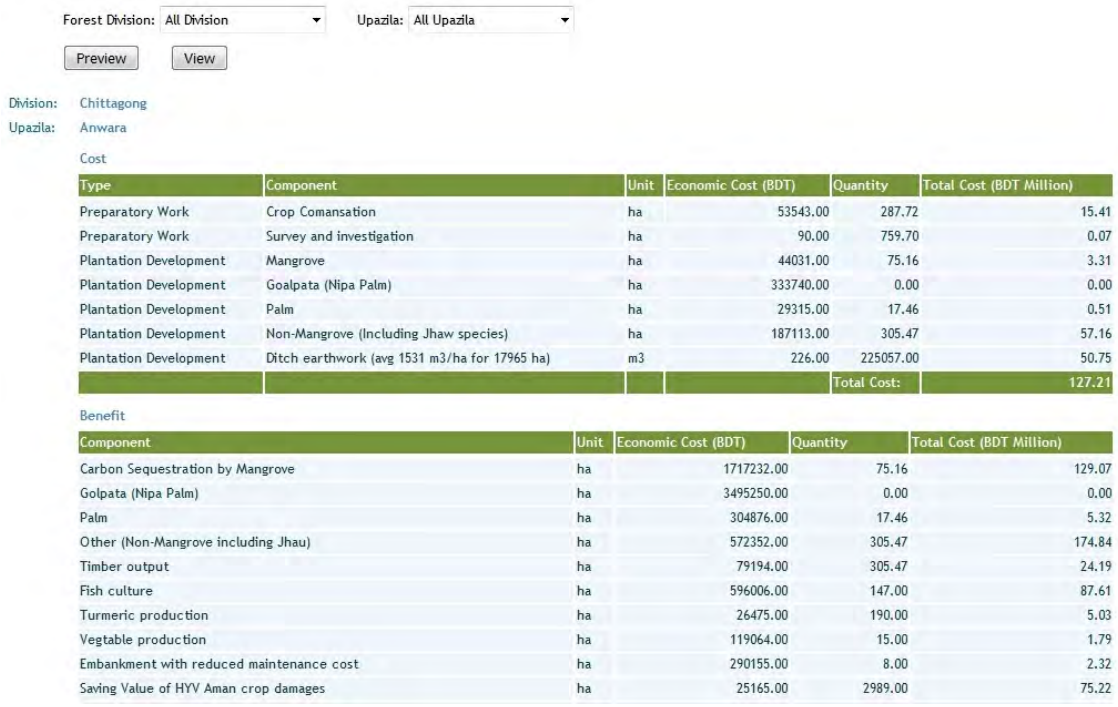
7. To view the map again, click View button.

4.2.3 Report View

This tool will help user to view the report of cost benefit analysis. To view the Report, do the following steps:

1. Clicking Report button will display the Report of total cost and benefit of a particular Forest Division and Upazila selected in the Cost and Benefit Panel.

2. Select *All Division* from Forest Division dropdown list to view report of *All Upazilas* under all Divisions (Figure 4.10).


Forest Division: All Division Upazila: All Upazila

Preview View

Division: Chittagong

Upazila: Anwara

Cost

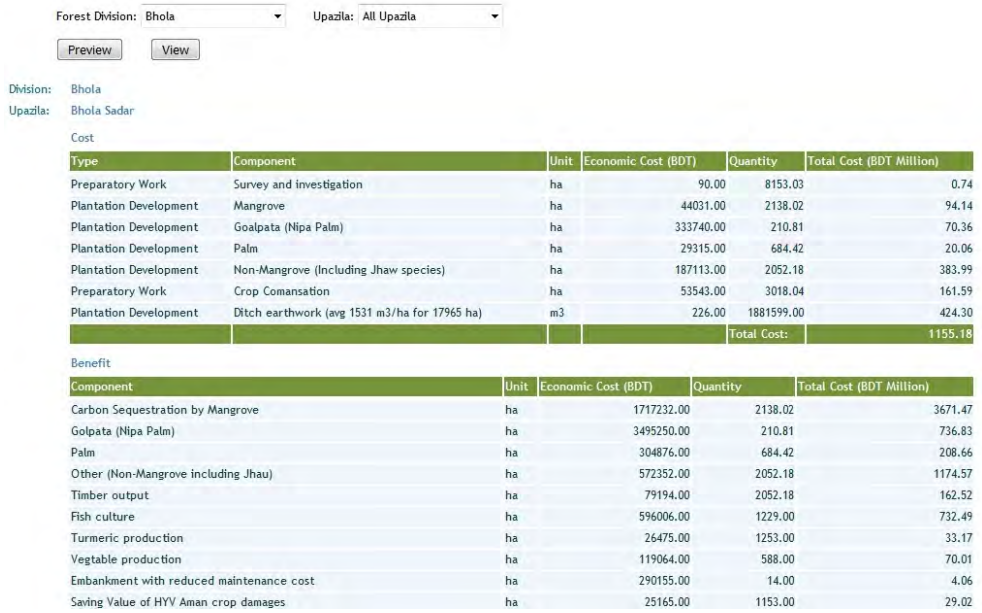
Type	Component	Unit	Economic Cost (BDT)	Quantity	Total Cost (BDT Million)
Preparatory Work	Crop Comansation	ha	53543.00	287.72	15.41
Preparatory Work	Survey and investigation	ha	90.00	759.70	0.07
Plantation Development	Mangrove	ha	44031.00	75.16	3.31
Plantation Development	Goalpata (Nipa Palm)	ha	333740.00	0.00	0.00
Plantation Development	Palm	ha	29315.00	17.46	0.51
Plantation Development	Non-Mangrove (Including Jhaw species)	ha	187113.00	305.47	57.16
Plantation Development	Ditch earthwork (avg 1531 m3/ha for 17965 ha)	m3	226.00	225057.00	50.75
				Total Cost:	127.21

Benefit

Component	Unit	Economic Cost (BDT)	Quantity	Total Cost (BDT Million)
Carbon Sequestration by Mangrove	ha	1717232.00	75.16	129.07
Golpata (Nipa Palm)	ha	3495250.00	0.00	0.00
Palm	ha	304876.00	17.46	5.32
Other (Non-Mangrove including Jhau)	ha	572352.00	305.47	174.84
Timber output	ha	79194.00	305.47	24.19
Fish culture	ha	596006.00	147.00	87.61
Turmeric production	ha	26475.00	190.00	5.03
Vegtable production	ha	119064.00	15.00	1.79
Embankment with reduced maintenance cost	ha	290155.00	8.00	2.32
Saving Value of HYV Aman crop damages	ha	25165.00	2989.00	75.22

Figure 4.10: Report View (All Division & All Upazila)

3. Select a particular Division such *Bhola* from Forest Division dropdown list and select *All Upazila* from Upazila dropdown list to view report of all Upazilas under selected Division (Figure 4.11).


Forest Division: Bhola Upazila: All Upazila

Preview View

Division: Bhola

Upazila: Bhola Sadar

Cost

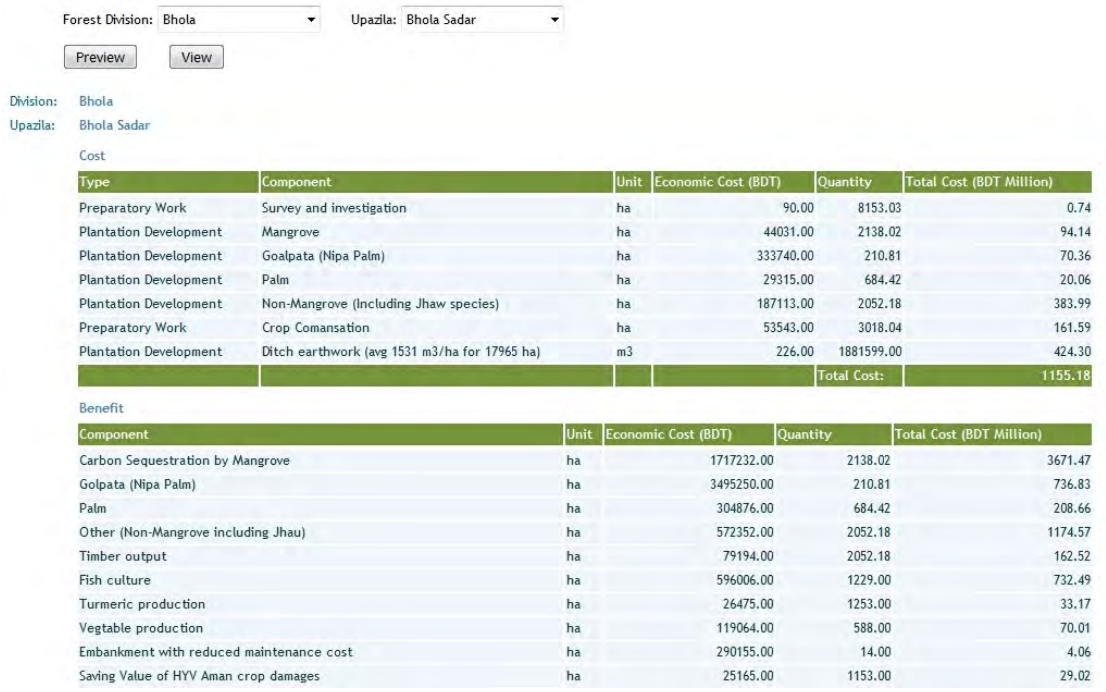
Type	Component	Unit	Economic Cost (BDT)	Quantity	Total Cost (BDT Million)
Preparatory Work	Survey and investigation	ha	90.00	8153.03	0.74
Plantation Development	Mangrove	ha	44031.00	2138.02	94.14
Plantation Development	Goalpata (Nipa Palm)	ha	333740.00	210.81	70.36
Plantation Development	Palm	ha	29315.00	684.42	20.06
Plantation Development	Non-Mangrove (Including Jhaw species)	ha	187113.00	2052.18	383.99
Preparatory Work	Crop Comansation	ha	53543.00	3018.04	161.59
Plantation Development	Ditch earthwork (avg 1531 m3/ha for 17965 ha)	m3	226.00	1881599.00	424.30
				Total Cost:	1155.18

Benefit

Component	Unit	Economic Cost (BDT)	Quantity	Total Cost (BDT Million)
Carbon Sequestration by Mangrove	ha	1717232.00	2138.02	3671.47
Golpata (Nipa Palm)	ha	3495250.00	210.81	736.83
Palm	ha	304876.00	684.42	208.66
Other (Non-Mangrove including Jhau)	ha	572352.00	2052.18	1174.57
Timber output	ha	79194.00	2052.18	162.52
Fish culture	ha	596006.00	1229.00	732.49
Turmeric production	ha	26475.00	1253.00	33.17
Vegtable production	ha	119064.00	588.00	70.01
Embankment with reduced maintenance cost	ha	290155.00	14.00	4.06
Saving Value of HYV Aman crop damages	ha	25165.00	1153.00	29.02

Figure 4.11: Report View (Bhola & All Upazila)

4. In order to view report for a particular Upazila, Select a Division such *Bhola* from Forest Division dropdown list and select Upazila such as *Bhola Sadar* from Upazila dropdown list (Figure 4.12).



Forest Division: Bhola Upazila: Bhola Sadar

Preview View

Division: Bhola
Upazila: Bhola Sadar

Cost

Type	Component	Unit	Economic Cost (BDT)	Quantity	Total Cost (BDT Million)
Preparatory Work	Survey and investigation	ha	90.00	8153.03	0.74
Plantation Development	Mangrove	ha	44031.00	2138.02	94.14
Plantation Development	Goalpata (Nipa Palm)	ha	333740.00	210.81	70.36
Plantation Development	Palm	ha	29315.00	684.42	20.06
Plantation Development	Non-Mangrove (Including Jhaw species)	ha	187113.00	2052.18	383.99
Preparatory Work	Crop Comansation	ha	53543.00	3018.04	161.59
Plantation Development	Ditch earthwork (avg 1531 m3/ha for 17965 ha)	m3	226.00	1881599.00	424.30
				Total Cost:	1155.18

Benefit

Component	Unit	Economic Cost (BDT)	Quantity	Total Cost (BDT Million)
Carbon Sequestration by Mangrove	ha	1717232.00	2138.02	3671.47
Golpata (Nipa Palm)	ha	3495250.00	210.81	736.83
Palm	ha	304876.00	684.42	208.66
Other (Non-Mangrove including Jhau)	ha	572352.00	2052.18	1174.57
Timber output	ha	79194.00	2052.18	162.52
Fish culture	ha	596006.00	1229.00	732.49
Turmeric production	ha	26475.00	1253.00	33.17
Vegtable production	ha	119064.00	588.00	70.01
Embankment with reduced maintenance cost	ha	290155.00	14.00	4.06
Saving Value of HYV Aman crop damages	ha	25165.00	1153.00	29.02

Figure 4.12: Report View (Bhola & Bhola Sadar)

5. After displaying, Report can be previewed using Preview button and can be downloaded as Pdf.

6. To view the report again, click View button.

Chapter 5: Data Entry

5.1 Overview

Using data Entry module data can be entered into the system. This module has been developed to capture component details required to calculate cost and benefit of a particular area.

5.1.1 Data Entry Panel

This panel contains one form for each component and helps to update Cost Type, Cost Component, Component Quantity, Greenbelt Total, Unit Cost and Unit Benefit.

Cost Type

In order to update Cost Type, do the following steps:

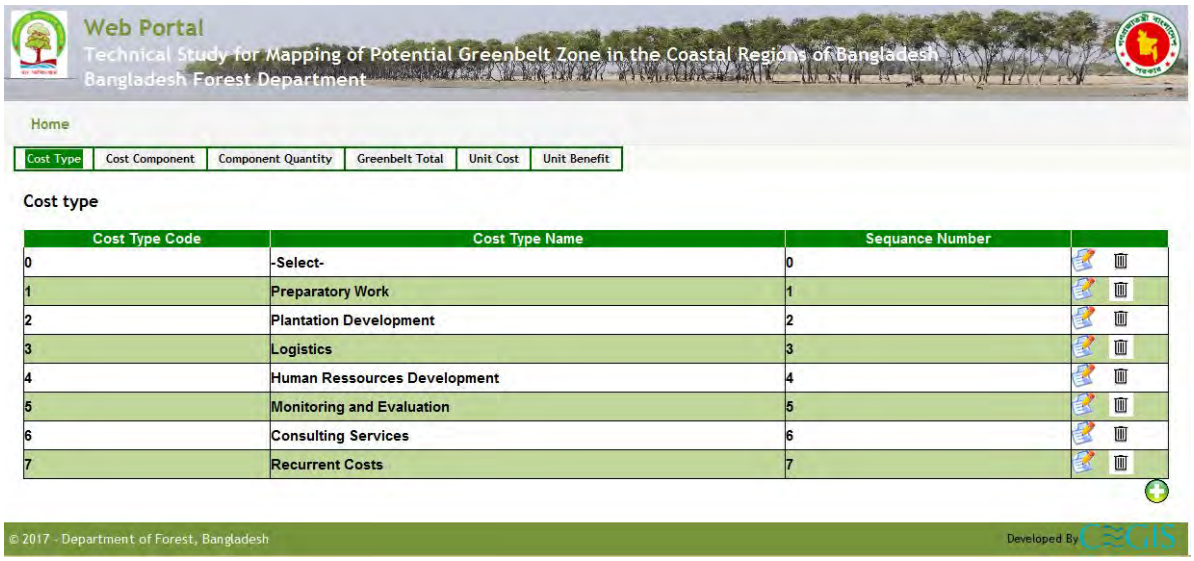
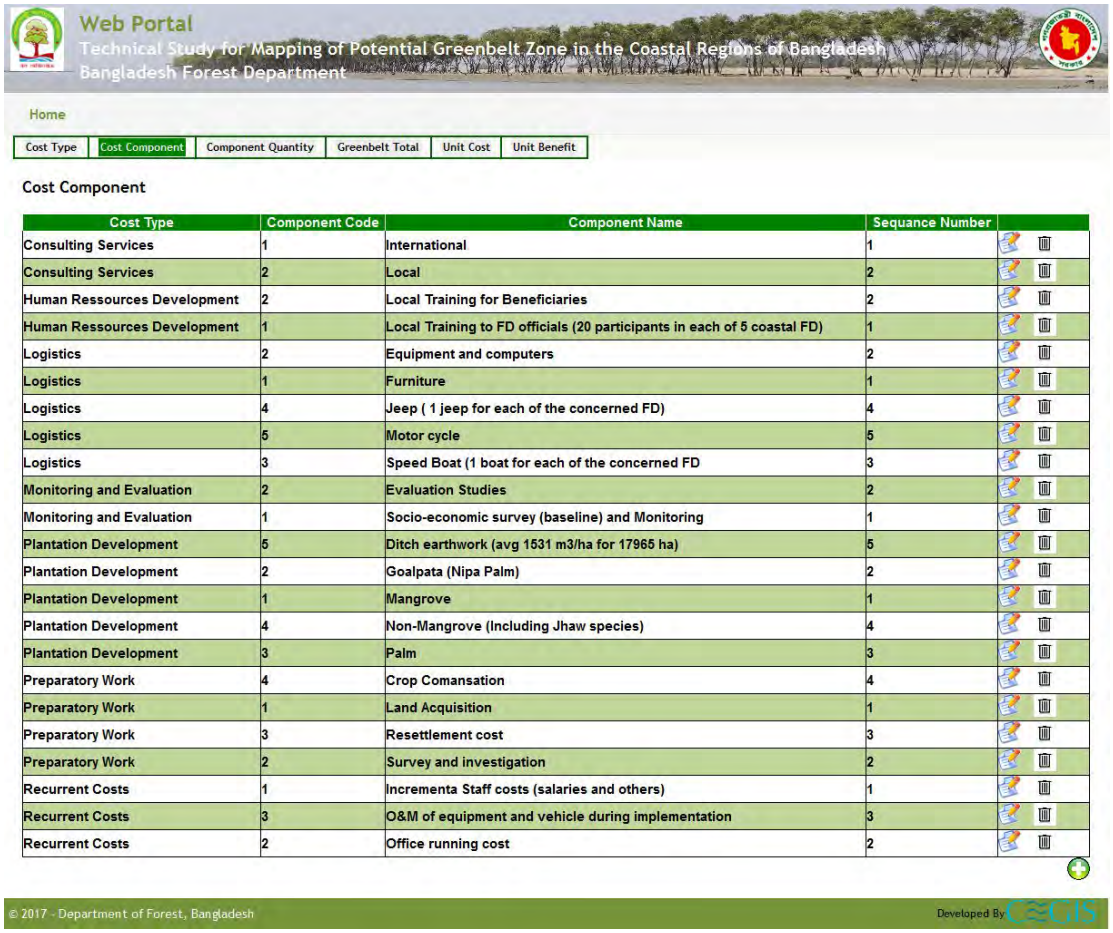


Figure 5.1: Cost Type

1. Click on  to enable the input mode of Cost Type.
2. Input the Cost Type Code, Cost Type Name and Sequence Number.
3. Click on  to save the information.
4. For discard the data click on  .
5. For delete and editing data in the table click on  and  respectively.

Cost Component:

In order to update Cost Component, do the following steps:



Cost Type	Component Code	Component Name	Sequance Number
Consulting Services	1	International	1
Consulting Services	2	Local	2
Human Ressources Development	2	Local Training for Beneficiaries	2
Human Ressources Development	1	Local Training to FD officials (20 participants in each of 5 coastal FD)	1
Logistics	2	Equipment and computers	2
Logistics	1	Furniture	1
Logistics	4	Jeep (1 jeep for each of the concerned FD)	4
Logistics	5	Motor cycle	5
Logistics	3	Speed Boat (1 boat for each of the concerned FD	3
Monitoring and Evaluation	2	Evaluation Studies	2
Monitoring and Evaluation	1	Socio-economic survey (baseline) and Monitoring	1
Plantation Development	5	Ditch earthwork (avg 1531 m3/ha for 17965 ha)	5
Plantation Development	2	Goalpata (Nipa Palm)	2
Plantation Development	1	Mangrove	1
Plantation Development	4	Non-Mangrove (Including Jhaw species)	4
Plantation Development	3	Palm	3
Preparatory Work	4	Crop Comansation	4
Preparatory Work	1	Land Acquisition	1
Preparatory Work	3	Resettlement cost	3
Preparatory Work	2	Survey and investigation	2
Recurrent Costs	1	Incrementa Staff costs (salaries and others)	1
Recurrent Costs	3	O&M of equipment and vehicle during implementation	3
Recurrent Costs	2	Office running cost	2

Figure 5.2: Cost Component

1. Click on  to enable the input mode of Cost Component.
2. Input the Cost Type, Component Code, Component Name and Sequence Number.
3. Click on  to save the information.
4. For discard the data click on  .
5. For delete and editing data in the table click on  and  respectively.

Component Quantity:

In order to update Component Quantity, do the following steps:

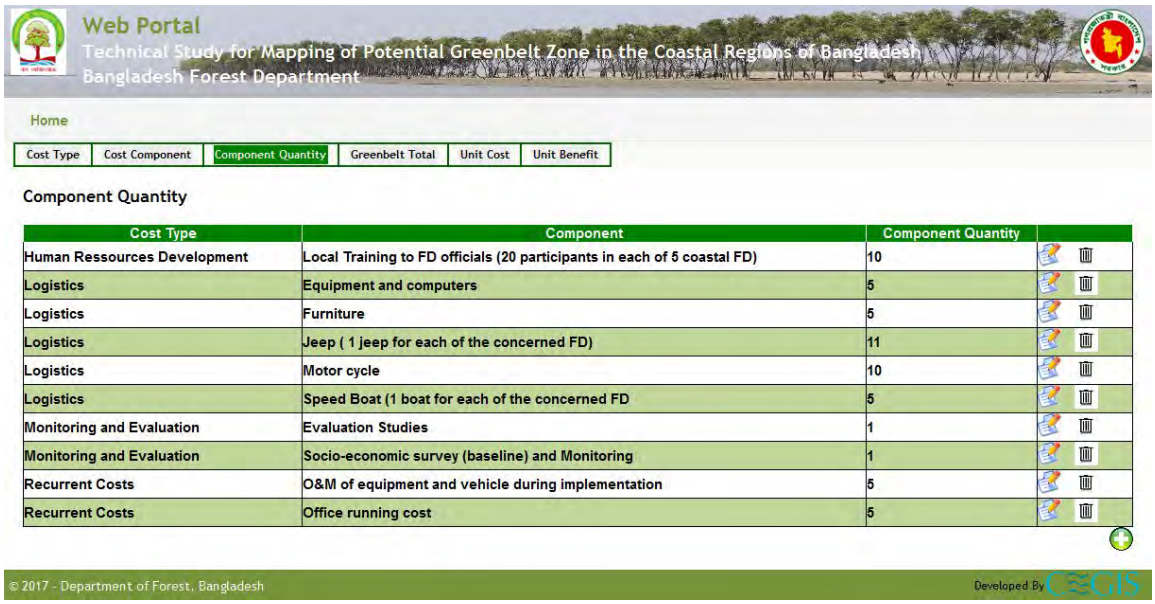


Figure 5.3: Component Quantity

1. Click on  to enable the input mode of Component Quantity.
2. Input the Cost Type, Component and corresponding Component Quantity.
3. Click on  to save the information.
4. For discard the data click on  .
5. For delete and editing data in the table click on  and  respectively.

Greenbelt Total:

In order to update total population, total area of embankment, fish culture, turmeric cultivation, vegetable gardening, HYV Aman damage save area etc., do the following steps:

Division	District	Geocode	Upazila	Population	Embankment	Embk_cost_red	Fish_culture	Turmeric	Veggard	havy_damge_save
Bhola	Bhola	100918	Bhola Sadar	430520	40	14	1229	1253	588	1153
Bhola	Bhola	100921	Burhanuddin	233860	12	12	656	625	375	834
Bhola	Bhola	100925	Char Fasson	546437	100	38	1778	2309	160	570
Bhola	Bhola	100929	Daulathkhan	168567	18	3	490	492	245	323
Bhola	Bhola	100954	Lalmohan	283889	33	27	810	895	291	267
Bhola	Bhola	100965	Manpura	76582	69	36	1006	1345	37	15
Bhola	Bhola	100991	Tazumuddin	126940	11	5	1129	1165	520	116
Chittagong	Chittagong	201504	Anwara	259022	75	8	147	190	15	2989
Chittagong	Chittagong	201508	Banshkhali	431162	168	16	146	148	70	3021
Chittagong	Chittagong	201520	Chittagong Port	208260	7	2	14	15	6	4
Chittagong	Chittagong	201535	Halishahar	151515	4	3	28	38	0	51
Chittagong	Chittagong	201553	Mirsharai	398716	60	0	21	23	9	2934
Chittagong	Chittagong	201555	Pahartali	190637	4	1	8	10	1	11
Chittagong	Chittagong	201565	Patenga	132677	15	8	145	138	83	134

Figure 5.4: Greenbelt Total

1. Click on  to enable the input mode of Component Quality.
2. Select Division, District and Upazila and enter geocode of Upazila, Population, total embankment area, embankment cost reduce for Greenbelt, total fish culture area, total turmeric cultivation area, total area of vegetable garden and HYV Aman damage save area.
3. Click on  to save the information.
4. For discard the data click on  .
5. For delete and editing data in the table click on  and  respectively.

Unit Cost:

In order to update unit value of different cost component, do the following steps:

Cost Type	Component	Unit	UnitCost	SCF	EconomicCost	ShpTbl_Type	ShpTbl_Name	GroupByOne	GroupByTwo	FieldName	WhereField	Wh
Consulting Services	International	BDT/ha	400	0.902	360.8	1		THACODE		Shape_Area		
Consulting Services	Local	BDT/ha	100	0.902	90.2	1		THACODE		Shape_Area		
Human Ressources Development	Local Training for Beneficiaries	BDT/ha	200	0.902	180.4	1		THACODE		Shape_Area		
Human Ressources Development	Local Training to FD officials (20 participants in each of 5 coastal FD)	batch	400000	0.902	360800	2	tblquantothers	TypeCode	ComponentCode	quantity		
Logistics	Equipment and computers	per FD	500000	0.902	451000	2	tblquantothers	TypeCode	ComponentCode	quantity		

Figure 5.5: Unit Cost

1. Click on  to enable the input mode of Unit Cost.
2. Select cost type, cost component and enter unit, unit cost, corresponding SCF and economic cost.
3. If area for corresponding component is extracted from shapefile, then 1 as enter shpTbl_Type. Enter group by fields (on which data will be grouped), name of the field contains area, field name used in where clause and corresponding field values, field used to join with shape, percentage of total area for where field values, etc.
4. If area for corresponding component is extracted from table, then enter 2 as shpTbl_Type and enter the table name. Enter group by fields (on which data will be grouped), name of the field contains quantity/area, field name used in where clause and corresponding field value, field used to join with shape etc.
5. Click on  to save the information.
6. For discard the data click on  .
7. For delete and editing data in the table click on  and  respectively.

Unit Benefit

In order to update unit value of different benefit component, do the following steps:

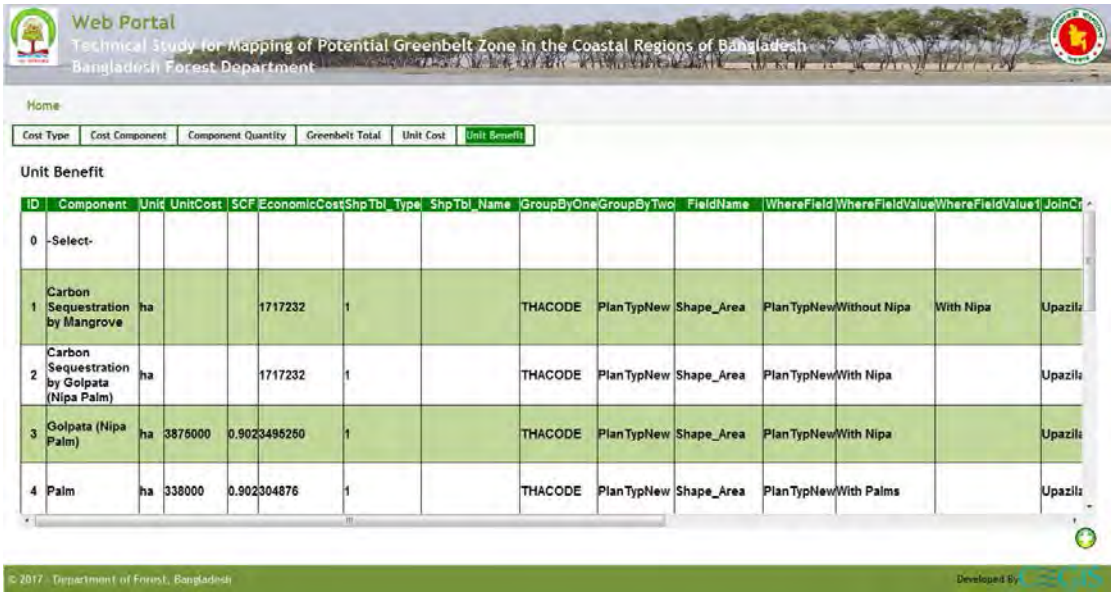


Figure 5.6: Unit Benefit

1. Click on  to enable the input mode of Unit Benefit.
2. Select benefit component and enter unit, unit cost, corresponding SCF and economic cost.
3. If area for corresponding component is extracted from shapefile, then 1 as enter shpTbl_Type. Enter group by fields (on which data will be grouped), name of the field contains area, field name used in where clause and corresponding field values, field used to join with shape, percentage of total area for where field values, etc.
4. If area for corresponding component is extracted from table, then enter 2 as shpTbl_Type and enter the table name. Enter group by fields (on which data will be grouped), name of the field contains quantity/area, field name used in where clause and corresponding field value, field used to join with shape etc.
5. Click on  to save the information.
6. For discard the data click on  .
7. For delete and editing data in the table click on  and  respectively.