

Government of the People's Republic of Bangladesh
Ministry of Water Resources



Bangladesh Water Development Board

Terms of Reference (ToR)
For
Upgrade and Update FFWC Website and Maintenance

August, 2012

Flood Forecasting and Warning Centre

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1. Introduction

1.1 Background

Bangladesh Water Development Board (BWDB), Under Ministry of Water Resources (MoWR) is the national organization mandated for sustainable management and development of country's water resources for betterment and enrichment of socio-economic condition of the population. Water resources management of the country is also vital to face the emerging challenges from Climate Change condition. The approaches to mitigate and manage the water related disasters, as well as climate change challenges of the country categorized as Structural and Non-structural measures. Top the non-structural measures adopted is the Flood Forecasting and Warning Services (FFWS) has been carried out by the Flood Forecasting and Warning Centre (FFWC) of the BWDB. Generation and dissemination of Flood Forecasting is widely recognized as a vital non-structural measures to aid mitigating and reducing the loss of lives, crops and properties caused by the flood. The FFWS activities are based on the mathematical modeling of the river and floodplain of Bangladesh. The present computational tool used for the FFWS is the "Super Model" based on the MIKE 11 modelling system. Using the results of the "Super Model" simulation, deterministic flood early warning has been generated upto 72 hours lead time. In addition to existing 24, 48 & 72 hrs deterministic forecast, 10 days lead-time probabilistic forecasts for mean, upper bound and lower bound WL at 18 locations in the country has been prepared.

Dissemination of daily FFWS is being done through fax, print copy(hard copy), e-mail and web-site(ffwc.gov.bd). The present system of data base management and the Web site of the FFWC was developed during 1989-92 under FAP10. Both the database and the web-site having many limitations as this has not been updated after development long back. Manuvering in the web-site is not very user friendly and it is entirely based on english laguage. This database is required for generation of Hydrograph in various form and options on water level gauge stations showing multi years Water Level hydrographs and rainfall information. The website of the FFWC lacks lots of features of modern websites developed after 1992. The web-site and the data base of the FFWC has to be improved, upgraded and updated. In the database there are number of inconsistencies of data (both for water level and rainfall), gap filling of historical data and updating some values. There have been many updates (change of values, historical maximum water level and historical maximum rainfall value (monthly and yearly value), the Danger Level of the respective stations) of Water Level data and information, all these have not been updated in the database and therefore generating wrong information in the web-site, which in many times giving wrong information. There is also some gaps in historical data (Water level and rainfall) or time series of few stations in the FFWC data base, therefore updated hydrograph for all the stations is not being developed. Development and updating of the database of the FFWC is important to overcome the limitations and generation of wrong information. With this development and updating, the database will be accurate and thus the generation and dissemination of flood information will be accurate. There are few examples of inconsistencies and gap of historical data is given in the following pages/sections. During the up gradation and improvement of the data base of the FFWC, more will be identified and corrected accordingly.

1.2 Objective

Make the existing FFWC website and database management updated, upgraded and user friendly with dynamic easy navigation menu system.

2. Scope of works

The web page will be bi-lingual option Bangle and English. Develop a dynamic web application representing a content management system with the following features:

2.1. Web Based Application Development & Implementation:

This will include mainly the following modules and features:

2.1.1. Interactive Home Page

2.1.1.1 Content of Home Page

- a. Short Information about FFWC, About us
- b. Mission, and Vision of FFWC
- c. Flood information
- d. Activities of FFWC
- e. Important News\Information scrolling facility

These are some of the indicative activities to be on the Home Page. The detail list will be prepared during the inception phase, with an inception workshop.

2.1.1.2 Administration:

All of the content of home page will be editable by administrator from admin panel.

2.1.2. User Inquiry:

Users of FFWC website will be able to search and view flood related data, hydrograph and information based on predefine key words or search criteria.

2.1.3. Dynamic Key Statistics

2.1.3.1 Administration:

All of the dynamic key information, statistical data etc will be entered by admin user from a secured admin panel.

2.1.4. Important Links

2.1.4.1 Administration:

Site admin will be able to add and remove any links from admin panel using an easy editor like MS WORD.

2.1.5. Digital Documentary System

2.1.5.1 Administration:

Site admin will be able to add and remove key words for flood related documents and reports archiving. Site admin also will be able to upload documents as an archive key word wise from admin panel.

2.1.5.2 User Inquiry:

User will be able to search documents from archive based on key words.

2.1.6. Messaging System

2.1.6.1 Administration:

Admin will be able to send a message for all FFWC's users or for a particular department or to a particular person from admin panel.

2.1.6.2 User Side:

FFWC's users when login to the system, will be able to see messages that were sent for that user, user also will be able to reply against message through this system.

2.2 Database Updating:

The database of the FFWC is the sources of proving information and generating hydrographs related to flood. The vendor will have to provide services for the FFWC database updating

and gap filling, error correction during the entire period of contract. This has to be secured from the entrance from the outside of the FFWC, like the system network users or the web-site users.

2.3 Web Site and Database Maintenance:

The vendor will have to provide maintenance and troubleshooting with training and technology transfer for **17 (seventeen) months** after commissioning of the developed web based application and the database management system. Maintenance will include mainly the following tasks:

- a. Fix any software problems within 3 days;
- b. Fix any security issues (including virus attacks and other security problems) within 24 hours;
- c. Maintain back-up and recovery of data;
- d. Assist the client (the FFWC professionals) to maintain and enhance the system through transfer of knowledge as required.

The maintenance issue is not limited to the above mentioned points, these are some indicative issues, the detail will be prepared during the inception workshop

3. Methodology

Methodology includes mainly the following features:

3.1. General Features:

- a. Server OS: Linux
- b. Database MySQL & Oracle
- c. Front end: PHP, CakePHP or CodeIgniter as a frame work & Joomla
- d. Content Management System
- e. Dynamic
- f. User level authentication & authorization
- g. A common site for non-registered users

3.2. Technical Features:

This website and the database management system will be developed using Content Management System (CMS) with following modules and features:

3.2.1. A public interface representing the organization website, which derives its content, layout, navigational menus and links from a relational database maintained through the administrative interface, and includes the following features (unless otherwise noted, the mechanisms of which are defined in the scope for the administrative interface):

- a. **HTML Templates** for powerful, custom, editable page layouts.
 - **Custom HTML Templates defined for each language and/or page** as desired that contain elements of the new creative design (provided by CLIENT), formatted to work with the custom content managed via the content management system (including client-defined menus).
 - **Templates can be modified and applied as needed by the client** in conjunction with the administrative interface to customize/ modify the site's appearance going forward.
 - **Client-defined content can be applied to templates or pages as desired** to allow for both common content (shown on multiple pages), and page-specific content as-needed.
 - **Templates can contain any number of content blocks** ex: Main content area, link section, news article list section, etc.), each of which are managed independently in the administrative interface.
 - **Content blocks can contain any number of elements (sections of html code), in any order**, allowing for page-specific information to be interspersed with common code (content used on multiple pages such as contact information) as desired.

- b. Content **Dynamic navigational items (menus)**, with labels, links & hierarchy all fully-definable for each language via the administrative interface.
- c. **Site search**, with results presented as abstracts including the content title (headline) and first 256 characters of content, with any html tags removed (for the purposes of showing the result set text without html elements, images, etc.).

3.2.2. A Staging Interface representing the company website in a pre-production status.

- a. **Client can create multiple draft versions** of the following elements:
 - Templates
 - Template Content Blocks
 - Template Content Elements
 - Navigational Menus
 - Pages
 - Page Content Blocks
 - Page Content Elements
 - Content Elements
- b. Client can create a pre-production version of the same elements
- c. Client can view a version of the website showing pre-production elements overriding their production counter parts.

3.2.3. A site-wide security permission system whereby system administrators with root access capabilities can:

- a. Define on a per user basis, the permissions relating to a section of the website.
- b. Permissions include the ability to create or modify any elements as defined in section 2a above.

3.2.4. A web-base administrative interface to be used by company site administrators, secured with username and password access, built in a modular format with the following features:

3.2.5. Content Management Modules

- a. **Templates Module** - manages the list of HTML page templates supported on the website by allowing the administrator to:
 - i. View the list of supported templates.
 - ii. View/edit fields associated with any given template, including the filename of the corresponding template (HTML) file, and the template is “active” (is production-ready and can be associated with pages).
 - iii. Add and/or delete template (add a record corresponding to a newly created template file and/or delete a record).
- b. **Template Content Blocks Module** - manages the properties of content blocks defined in each HTML template by allowing the administrator to:
 - i. View the list of current blocks, to ensure correlation with the content blocks defined in the HTML template.
 - ii. View/edit fields associated with any given block, including:
 - The block label, used to identify the corresponding template block (matching the label of the dynamic block in the template).
 - The block type, whether “page” based (in which content is defined independently for each page in each language see the Page Content Blocks Module), or “template” based (common to all pages using the template—this is useful for including common content on multiple pages, such as news items).
 - If the block is template-based (not page-based), the “headline” or “title” associated with the block, this label can be used in the block template to headline the content block itself. Note: Template block “common content”

is not returned in the set of site search results, since there would be no definable page to which to direct the user.

- iii. Add a page content block.
- iv. Delete a page content block.
- c. **Template Block Elements Module** - manages the content elements contained in a given template content block (This allows for multiple content elements to be contained within a content block, which allows for the combination of template-specific content elements with more common content elements, such as the current date or company contact information, within a single content block in the template), by allowing the administrator to:
 - i. View the list of content elements contained in the block.
 - ii. View/edit fields associated with any given block element, including the identity of the element for each of the high and low bandwidth versions of the block (among all defined content elements in the system see the Content Elements Module), and its rank among other elements (determines order top-to-bottom within the block).
 - iii. Add a content element to the block.
 - iv. Delete a content element from the block.
- d. **Navigation Items Module** —manages the website’s navigational menu items by allowing the administrator to:
 - i. View the hierarchy (parent-child structure) of the current set of navigation items in any defined language.
 - ii. View/edit fields associated with any given navigation item, including:
 - Parent item (if not a top-level item).
 - Rank amongst sibling items (all items having the same parent item), which determines order top-to-bottom in the list.
 - Whether there is a link associated with the navigational item (can be null if the navigation item is simply a parent item with no associated “link-to” page), and whether the link is to an internal page (of the content management system) or an external url (can be used to link to modules of the system that are external to the content management system, such as the newsletter module and/or trading partner search, or an external url such as google.com, etc.).
 - For each defined language, the item label and whether the item is to be active (allows for items to be available in one/more language).
 - iii. Add and/or delete a navigation item.
- e. **Pages Module** - manages the web pages themselves by allowing the administrator to:
 - i. View the list of current pages, according to their association with navigation items viewable in any language (as in Navigation Items Module).
 - ii. View/edit fields associated with any given page, including:
 - Associated navigation item (Note: this field will determine only the “categorical” association of the page to a navigation item, for purposes of organization in the administrative interface. It will not necessarily require that the page be the page that is requested when the navigation item is selected in the user interface-this association is defined in the Navigation Items Module since each item can at most request a single page).
 - Default HTML Template, if not the default template associated with the given language (this allows for a page to use the same HTML template regardless of language, if desired, which would be useful for unusual views such as diagrams, etc. in which language should not be a determiner of the template used).
 - For each defined language:
 - ⇒ The page title (shown as the title of the browser window).

- ⇒ The associated HTML Template, if not the default template for the page (this allows a single page in a single language to be associated with its own separate HTML Template, if desired).
- iii. Add and/or delete a page.

f. Page Content Blocks Module —manages the page-specific properties of page-based content blocks defined in the HTML template by allowing the administrator to:

- i. View the list of current blocks, to ensure correlation with the page-based content blocks defined in the HTML template.
- ii. View/edit fields associated with any given block, including:
 - The identities of the corresponding template block, by label, this tells the system where to render the content block on the page.
 - The “headline” or “title” associated with the block—this label can be used in the block template to headline the content block itself, and is also used as the title when the block is returned in a set of site search results.
- iii. Add and /or delete a page content to/from the block.

g. Page Block Elements Module - manages the content elements contained in a given page content block (This allows for multiple content elements to be contained within a content block, which allows for the combination of page-specific content elements with more common content elements, such as current date or contact information, within a single content block in the page), by allowing the administrator to:

- i. View the list of content elements contained in the block.
- ii. View/edit fields associated with any given block element, including the identity of the element for each of the high- and low- bandwidth versions of the block (among all defined content elements in the system—see the Content Elements Module), and its rank among other elements (determines order top-to-bottom within the block).
- iii. Add a content element to the block.
- iv. Delete a content element from the block.

h. Content Elements Module - manages the content to be displayed on the website, as a content “library” containing content packets or “elements,” by allowing the administrator to:

- i. View the list of content elements defined for the site.
- ii. View/edit fields associated with any given content element, including:
 - Metadata fields as needed, including revision date and author of the html content.
 - Whether the element is “static” (contains hard-coded html), or “dynamic” (relies on a script to determine its value—this allows for dynamic content such as the current date, a list of news articles, etc. Note: Client will pre-populate the library with dynamic elements supporting any dynamic modules contained in the system, such as the list of news articles, etc.)
 - For “static” elements, the html content itself. Notes:
 - ⇒ The content field in the database will have the ability to store html code, including text, tags and browser-side scripts as desired by the client. Any references to support files such as images, Flash files, documents, etc. will include the “supporting documents” folder, so the client can copy referenced files via direct network access outside this system.
 - ⇒ Method for defining links to other internal site pages, utilizing common html link definition structure, will be provided to the client example/via instruction (ex: Contact Us).
 - For “dynamic” elements, the associated script to be included and evaluated for generating the element content. Notes:
 - ⇒ The Client will pre-populate the library and create associated scripts for dynamic elements supporting any dynamic modules contained in the system, such as the list of news articles, etc.

- ⇒ Include scripts must meet certain technical requirements in order to function properly.
- iii. Add a content block.
- iv. Delete a content element from the block.

3.2.6. Other Site Management Modules

- a. Administrators Module**-manages the list of administrators allowed to operate the system by allowing the administrator to:
- i. View the list of administrators.
 - ii. View/edit fields associated with any given administrator record, including name, username and password, and whether “active” (allowed to log into administrative interface).
 - iii. Add an administrator.
 - iv. Delete an administrator.

4. Duration of Services

Following table shows the service schedule:

Serial No.	Service Name	Duration
1.	Development, Updating, upgrading the existing FFWC website and database management with dynamic easy maneuvering system and make it more user friendly. Development, Implementation and Commissioning of FFWC's website from static to dynamic using DHTML, PHP & Joomla as front end, MySQL & Oracle as Database Server and Ajax Technique and Training of FFWC personnel for maintaining the website and the database management system.	4(four) months
2.	Maintenance, tuning and trouble shooting of web site and the database system. Training and technology transfer to the FFWC professionals.	17 (seventeen) months

The total period is estimated to be 21(twenty one) months. Submission of reports should be in the following schedule:

<u>Name of Reports(number of copies)</u>	<u>Target Time</u>
Inception Report (30 copies)	15 days from the signing of contract
Web-site development, upgrading and updating with testing and commissioning Reports (30 copies)	end of the 4 th month
Maintenance, tuning, trouble shooting n of the web-site and training & technology transfer (30 copies)	end of the 15 th month
Draft final report (30 copies)	end of the 20 th month
Final Report (40 copies)	end of the 21 st month

5. Team Composition and Qualification of Professionals

It is estimated that a team of total 16(sixteen)person-months of 04(four) local professional staffs would be required to complete the consultancy service including relevant data collection. Team composition is given table below.

Table 1: Team Composition and person-months

Sl No	<u>Position</u>	<u>Person Months</u>
1	Team Leader/Senior Specialist	4
2	Senior Web page Developer	4
3	Junior Web Page Developer	4
4	Junior Database Management Specialist	4
	Total person months	16

Qualification and tasks of the professionals

Sl No	Expert Personnel Discipline	Qualification and Requisite Experience	Tasks(His/her major responsibilities shall include but not necessarily be limited to the following)
1	2	3	4
1	Team Leader / Senior Specialist	Masters or B.Sc. with post graduate degree or post graduate diploma in Computer Science/ Computer Engineering / Software Engineering/ System Engineering. Total 5(five) years of experience with 3 years relevant experience.	He/ she will be overall responsible for the consultancy services. Prepare plan, schedules and time frame of services for reports. Consult on critical areas. Oversee quality and timely delivery of services & reports. Mediate on behalf of Consultant with client Organize meetings and workshop Miscellaneous task as and when required
2	Senior Web Page Developer	Masters or B.Sc. with post graduate degree or post graduate diploma in Computer Science/ Computer Engineering / Software Engineering/ System Engineering. Total 5(five) years of experience with 3 years relevant experience. Previous experience of similar work completion in large Govt. agency/offices like DAE, LGED, BMD, DMB etc is desirable.	Prepare Web-site of the FFWC Work for testing and commissioning of the web-site, to be developed, Work for tuning, trouble shooting after commissioning. Attend meeting as and when required and maintain liaison with required other agencies Prepare workshop materials and to assist the Team Leader Work for training and technology transfer Miscellaneous task as and when required
3	Junior Web Page Developer	B.Sc. in Computer Science/ Computer Engineering / Software Engineering/ System Engineering. Total 3(three) years of experience with 2 years relevant experience. CCIE or equivalent network configuration/management proficiency certificate. Must have experience in commissioning broadband wireless fixed access network	Assists Senior Web Page Developer Review the information on FFWC's Web-site. Preparing the Web-site. Assist Senior Web Page Developer and Team Leader for carry out the consultancy services Work for training and technology transfer Miscellaneous task as and when required
4	Junior Database Management Specialist	B.Sc. in Computer Science/ Computer Engineering / Software Engineering/ System Engineering. Total 3(three) years of experience with 2 years relevant experience.	Assists Team Leader and Senior Web Page Developer Review the database of the FFWC required for the web-services. Prepare plan and implement for the development of the database related services Miscellaneous task as and when required

6. Requisite Qualification, Experience for the Service:

The requisite qualification and experience for the above services are as follows:

- a. The consultant firm must have proven track records (Service Performance Certification) for developing and maintaining of minimum two dynamic SQL database based websites of large corporate (nationwide operation) like BWDB, DMB, LGED, BMD, DAE etc;
- b. Overall experience of minimum 3 years.
- c. Valid Trade License;
- d. Valid Income Tax Payment Certification;
- e. Recent Bank Solvency Certificate.

7. Responsibilities

7.1. FFWC's Responsibilities

The consultant will work under the overall supervision of the Chief Planning, BWDB and the Project Director, "Strengthening FFWC's Early warning Capacity Project" under CDMP-II, is being implemented under FFWC, BWDB and under coordination & supervision of Executive Engineer, FFWC, BWDB and the Focal Person of the CDMP-II project, BWDB part. The FFWC shall assist the consultant as required for proper implementation of the services.

The Executive Engineer, FFWC, BWDB and the Focal Person of the CDMP-II project, BWDB part under the directives of the PD of this project, will ensure that the objectives of the service as detailed in the TOR are achieved within the agreed time schedule. The Executive Engineer, FFWC, BWDB will, in the context of the TOR, direct the planning process and work program supervise the execution of the service and monitor progress according to the said objectives. In particular, the Executive Engineer, FFWC, BWDB and the Focal Person of the CDMP-II project, BWDB part will monitor all activities on the critical path and will take necessary action in good time where such monitoring shows that outputs are not likely to be supplied/implemented at the required time. The consultant will be required to reschedule activities on the orders of the Executive Engineer, FFWC, BWDB and the Focal Person of the CDMP-II project, BWDB part if this necessary.

The consultant will have regular meetings with the FFWC of BWDB professional staff and to discuss technical and management issues. Any unresolved issue technical or otherwise should be taken up with the Chief Planning, BWDB and the PD, of this project under CDMP-II, BWDB part. BWDB will provide the available data required for the system development as per rule for the services and facilities.

7.2. Consultant's Responsibilities

The consultant shall carry out the services as detailed in "Scope of Works" in the best interest of the Government with the reasonable care, skill and diligence with sound technical, administrative and financial practices and shall be responsible to the executive agency (BWDB) for discharge of responsibilities.

The consultant will be responsible to the Executive Engineer, FFWC, BWDB and the Focal Person of the CDMP-II project, BWDB part, BWDB, Dhaka who is under the Chief Planning, BWDB, Dhaka for proper and timely execution of all the activities related to the services mentioned in this TOR. It is also expected that the consultant will work in close collaboration with the FFWC professionals in this regard. The vendor will:

- Make necessary arrangements for data collection as needed for the services as specified in this TOR;
- Provide technical support staff needed for the effective delivery of the services as specified in this TOR.

- Take care and incorporate the suggestions/recommendations of the inception workshop as agreed by the PD.
- Take care of the operation and maintenance of the website and developed web enabled applications as specified in this TOR;
- Take care of the operation and maintenance of the database management system and developed applications as specified in this TOR;
- Take care of the training and technology transfer to the FFWC for the capacity development for web and database maintenance specified in this TOR;
- Prepare the user manuals to operate and maintain the website, database management system and developed web enabled applications as specified in this TOR;
- Maintain liaison with other departments and agencies related to the operation and maintenance of the website and the database management system and developed web enabled applications as specified in this TOR;
- All relevant reports, web development, application, web operation and maintenance and database management system, training manuals, to be delivered to the FFWC in hard and soft form(CD), in multiple copies, as directed by the PD of this project;
- Professionals of the consultant team may share the office space of the FFWC as agreed by the PD and the Focal Person of this project under CDMP-II for proper implementation of the agreed activities as specified in this TOR.
- All other works necessary as and when required and directed by the PD and by the Executive Engineer, FFWC, BWDB and the Focal Person of this project under CDMP-II, BWDB part, BWDB or authorized person of the Chief Planning and PD, BWDB, Dhaka for proper and timely execution of all the activities related to the services mentioned in this TOR.