Government of the People's Republic of Bangladesh

Project Implementation Unit

National Agricultural Technology Program- Phase II Project (NATP-2)

Department of Fisheries

Terms of Reference

For

Development of Website under DoF for Fish Farmers

Package No. SD/DoF/F-05

December 2018

Government of the People's Republic of Bangladesh
Project Implementation Unit
National Agricultural Technology Program - Phase II Project (NATP-2)
Department of Fisheries
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1. **Terms of Reference for Selecting a Consulting Firm for Development of Website under DoF for Fish Farmers (Package No. SD/ DoF/F-05).**

Assignment title	Development of Website under DoF for Fish Farmers (Package No. SD/ DoF/F-05)
Assignment duration Contract period	Software Development 4(Four) months and Maintenance service Upto 30 September 2021 or upto the end of the Project.
Funding source(s)	IDA & IFAD Credit
Contracting entity	Director PIU, NATP-2, DoF

2. **Context of the Assignment**

Agriculture in Bangladesh comprises crops, livestock and fisheries. It provides food, feed, fiber and fuel to its citizens and animals, and plays a key role in economic development of Bangladesh. For achieving the set goal of SDG and turning Bangladesh into a middle income country by the 2021, the GDP has to grow by 7.4% per year. To attain the rate and to keep pace with the population growth, agriculture must grow at a constant rate of minimum 3-3.5% per year. Reaching technologies to the farmers requires technology generation and dissemination through the research and extension systems. National Agricultural Research System (NARS) is responsible for generating agricultural related technologies and Department of Agriculture Extension (DAE), Department of Fisheries (DOF), and Department of Livestock Services (DLS) are responsible for extension of generated technology to the farmers. Both research and extension have made an impressive contribution to food security in the country. In Bangladesh, private investment in research and extension is low. The NGOs, local government and community organizations are coming up but very slowly.

Bangladesh agriculture faces many challenges today. Major challenges are to raise productivity and profitability, reduce high production costs, increase price of products and resource-use efficiency, adaptation to climate change vulnerability, providing consumers safe food, production & distribution of quality seeds/varieties/ breeds/fingerlings, popularization of good agricultural practices, weak linkage of farm-produces with market etc. These challenges have stagnated the agricultural productivity and production. Further, nutrition outcomes and food safety have not kept pace with the progress achieved with most social and economic indicators. Thus, in order to produce more food for an ever increasing population, raw materials for agro-industries and higher income for farming communities from the decreasing resources (land, water, animal and fisheries), it is necessary to develop existing agricultural production system into a more dynamic, market oriented and sustainable commercial sector by higher

productivity and profitability through efficient natural resources management, agricultural intensification and diversification, mechanization, value addition and effective market linkages.

To that effect, the Government of Bangladesh (GOB) gives top priority to the development of agriculture sector through its increased productivity, production, supply chains, value addition and market linkages. GOB sought the support of development partners such as the World Bank to provide technical and financial support to activities aimed at boosting agricultural production through productivity enhancement, and increasing smallholders' income. In order to improve agricultural productivity and farm income, on the request of the Government of Bangladesh, the World Bank agreed to support a long term agricultural development program over a period of 15 years to be implemented in three phases of five years each with the first phase beginning in July 2007. IFAD also agreed to co-finance the program with the World Bank. Accordingly, the National Agricultural Technology Project (NATP): Phase-I (NATP-1) was designed with the development objective of improving the effectiveness of national agricultural technology system (including agricultural research, extension and development of supply chains) and increasing agricultural productivity and farm income in Bangladesh. NATP-1 was initiated in July 2007 and closed in December 2014. NATP-1 has significant achievements in generating technologies, increasing the effectiveness of extension and research systems, development of supply chains and broadening linkages between research-extension-farmers across the project areas. Based on the experience of NATP-1, the World Bank, jointly with IFAD and USAID, decided to provide financial support to GOB for National Agricultural Technology Program- Phase II Project (NATP-2).

3. Project Development Objective :

Project Development Objective (PDO) of National Agricultural Technology Program-Phase II Project (NATP-2) is to increase agricultural productivity of smallholder farms and improve smallholder farmers' access to markets in selected districts. PDO will be achieved through: a) strengthening the capacity of research, extension services and farmers to generate, diffuse and adopt agricultural technologies aimed at increasing farm productivity and reducing post-harvest losses; and b) promoting the sustainability of existing and newly created farmer groups and producer organizations by facilitating their stronger participation in commodity value chain, market-linkages, and improving their knowledge and skill base. Thus, the PDO will be achieved through the generation and release of more productive and locally adapted technologies, enhancing availability of quality seeds/breeds/fingerlings/ breeding materials at the small farm level and providing relevant production, value addition, food safety and marketing support.

4. Project Components

NATP-2 project will have the following 5 components:

Component-1 (Enhancing Agricultural Technology Generation): To be implemented by the Project Implementing Unit of Bangladesh Agricultural Research Council (PIU-BARC), MOA;

Component-2 (Supporting Crop Development): To be implemented by the Project Implementing Unit of Department of Agricultural Extension (PIU-DAE), MOA;

Component-3 (Supporting Fisheries Development): To be Implemented by the Project Implementing Unit of Department of Fisheries (PIU-DOF), MOFL;

Component-4 (Supporting Livestock Development): To be implemented by the Project Implementing Unit of Department of Livestock Service (PIU-DLS), MOFL;

Component-5 (Project Management): To be implemented by the Project Management Unit (PMU), NATP-2, MOA.

Bangladesh has recorded surplus fish production with an annual output of 41.34 lakh MT against a demand of 4.134 million MT in 2016-17. Bangladesh has achieved self-sufficiency in fish production. The target of fish production was 40.50 lakh MT in 2016-17, but it crossed the target by producing 41.34 lakh MT fish in Bangladesh. It's a big achievement for the country. There are fish 28% capture, 56% Culture and 16% marine in Bangladesh.

After attaining self sufficiency in fish production, the new challenge is to sustain it. Most important elements here are production and distribution. Not only production has to remain at the attained level, at the same it has to meet the ever increasing demand for more fish. Maintaining an effective backward linkage (technology, inputs, capital, etc.) as related to production supply chain is a matter of prime concern here. This linkage has to be quality wise acceptable as well as cost supportive without further affecting the prevailing purchase power parity. On the other hand, produce (wet fish and fishery products) distribution has to be capable of minimizing various types of post harvest losses attributed mainly to poor handling of wet fish, poor marketing system that does not work neither in favour of producers nor the consumers, the poor transportation system, and the poorly produced fishery products, and all these in the absence of even a moderately developed cool chain. All these leave no room for the poor farmers whereby they can maneuver the pricing mechanism forcing them to accept whatever the 'market' decides. So far, the 'market' has hardly worked in favour of them to ensure a reasonable price with an attractive profit margin. It is therefore very important, for the sake of production sustainability, to create a room wherefrom the farmers can effectively address the pricing issue.

The following research-based statistics illustrate the characteristics of quality losses in wet fishes. Post-harvest quality loss in wet fish occurs, based on different species and seasons, from 7- 19%, with an average loss encountered was 12.5%. Availability of ice, quality of ice and method of icing have been the key elements for quality loss in wet fish. Fish containers play a significant role in reducing quality loss from 23% in traditional bamboo basket to 2.5% in insulated Styrofoam box. About 20-25% fish of the country are consumed fresh, while 35-40% fish that require icing, are partially iced, except ilish, prawn, shrimp, pomfret and other high valued marine species, where adequate icing is practiced. Eighty eight percent fishermen, 77% fish farmer, 27% retailers and 47% fish vendors do not use ice in fish. Among the wholesalers/transporters, 12% use a ice-fish ratio of 1:1 and 44% use a ratio of 1:2. Most of wholesalers, retailers and vendors use an ice: fish ratio of 1:3 to 1:5, which is quite negligible.

The above paragraphs not only showcase the production scenario, it also portrays the positive aspects of developing a technology based forward linkage basket to shape the future of overall supply chain mechanism, beneficial to the farmers, traders as well as the end users, i.e., the consumers, The present assignment is all about to humbly support the mechanism by supporting the route shown by NATP-2's in improving farmers' access to market through effective

introduction of Producer Organizations (POs) as active actors in the field of Fish Supply Chain in selected areas.

NATP-2, DoF component will carry out an integrated approach to increase fish productivity, quality and output and facilitate fish farmers' access to market by, inter alia:

a) Providing support for the sustainable development of inland culture fisheries and inland capture fisheries;
b) Promoting selected fish production models involving improved fish varieties;
c) Supporting the production of better quality fish seed;
d) Supporting the introduction of appropriate fish feed;
e) Applying relevant fisheries management tools including community based fisheries management activities;
f) Restoring aquatic habitats;
g) Creating suitable marketing linkages for better access to market;
h) Supporting institutional capacity enhancement for quality control of fish feed development including the improvement of associated facilities;
i) Promoting climate resilient and innovative aquaculture technologies;
j) Strengthening existing and recruiting new local extension agents for fisheries aimed at expanding the delivery of extension services, and improving their skills, mobility and connectivity;
k) Promoting ICT based extension methods;
l) Carrying out of activities to strengthen the linkages with fisheries research;
m) Facilitating the participation of small holder fish farmers in selected commodity markets;
n) Improving fish market infrastructure and management of such infrastructures; and
o) Establishing and operating a matching-grant scheme aimed at supporting the adoption of new fish technologies and the carrying out of rural services and value chain activities beneficial to fish farmer groups.

5. Scope of the work

The portal system will be a bidding place for buyers and sellers of wholesale fish market. The objective of the portal is to introduce an online market place for the fish farmers, fishermen and fish merchants. The portal will help the farmers to get better price by reducing the number of layers of fish supply chain across the country. The retail customers will be also benefitted by getting fish in lower price.

5.1 Scope of Services and overall responsibilities

The Firm should follow an appropriate methodology to complete the assignment following six phases of software development life cycle model.

1. Requirement gathering and analysis to prepare Concrete System Requirement Specification (SRS)
2. Design (System Analysis and Design, Data Flow Diagram (DFD), Entity Relationship Diagram (ERD), Data Dictionary, Form, Report design and so on)
3. Coding

4. Implementation and Testing as per guideline of MIS plan
5. Deployment.
6. Maintenance.
7. The firm will host the system along with database during the development in their preferred data center with high security environment;
8. The firm will be solely responsible to ensure Load Testing, Security Testing and necessary Integration Testing of the online application.

The Firm should also follow the below points for the accomplishment of the assignment
1. Analyzing and designing of the solution architecture for the portal
2. Develop methodology for data security and access control implementation
3. Development of Table, Query/View, Function, Procedure, Form, Report as per requirement.
4. Scope to Develop (at any time) customize Table/ DB, customize Form, customize Menu & Sub Menu, customize Report etc must be included in the Admin panel of the portal
5. Standard layer Data architecture should be followed in software development
6. Various report should be generated.
7. Provision for combined report generation should be in the system.
8. Software should be mobile enabled.

5.2 The portal system will have four interfaces for the users to interact with the server system

1. Admin Panel
2. Public Site
3. Android Mobile Application
4. Buying and selling through SMS

Admin Panel

The system and content administration team will use the admin panel.

Public Site

Any person can browse the site and bid any product with/without registration

Android Mobile Application

With an Android mobile application, a seller can upload product with pictures under predefined categories.

Buying and selling through SMS

A seller will be able to upload a product for bidding by sending SMS to a hotline number. A buyer can also bid for the product by sending SMS to a hotline number.

5.3 Few primary attributes of the portal system

1. Authentication and authorization.
2. Configurable user group and user permission.
3. Easy to use interface for uploading products by mobile phones.
4. Automatic location identification of the seller and buyer.
5. Phone number based user authentication.
6. Image versioning.
7. Approval for publishing a product by admin.
8. Push notification via email, SMS and mobile application.
9. Sellers can upload product and price through SMS
10. Buyers can get SMS notification for updated product and price for subscribed categories and location.
11. Buyer and seller will receive each other's mobile number while bidding
12. Bidding can be done through SMS
13. Admin can approve/disapprove any buyer, seller and product.
14. Buyer and seller both can be ranked.
15. System can be used in the areas with very low band width internet connection.

5.4 Technical Features

1. Distributed application, Server caching and load balancer.
2. System has to handle large amount of data and image.
3. MVC architecture.
4. The system architecture must be scalable for future enhancement.
5. Any standard relational database can be used.
6. All licensed or open source products/technologies have to used
7. The web-based application should support cross browser platforms (popular web-browsers such Mozilla Firefox, Opera, Chrome, Internet Explorer, Safari etc.)
8. UI should be developed based on the analysis of UX.
9. Any web interface of this application should be fully responsive

5.5 Hosting Requirements

1. Main Web enabled portal will be hosted in National Data Center (NDC)/Suitable Hosting Environment.
2. Hosting requirement /environment (hardware, servers, network, security, storage, traffic, firewall, bandwidth etc)
3. Hosting architecture
4. Data Growth and Scalability plan
5. User handling/load balancing mechanism
6. Scheduled backup & Restore Requirements
7. Disaster recovery requirements

5.6 Users and User Roles:

Sl. No	User Type	Users	No. of User
1	System User	System Analyst/ICT Specialist or ICT Focal Point	5
2	General User	DOF Officials	350
3	Service Recipient User	Leaf / CIG/ Farmers /Dealer	50,000

Vendor should submit a comprehensive plan and approach covering different types of users and their roles providing accessibility, privacy, confidentiality and transparency based on the given statics. Also have to mention the user friendliness login system

5.7 Security

The consulting firm should follow any of the industry standard secure development methodology such as comprehensive Lightweight application security process. The consulting firm should consider (but not limited to) Common vulnerabilities such as SQL injections, Cross Site Scripting (XSS) etc. Consulting firm should undertake responsibilities for input validation controls, Authentication, Authorization control and other security controls in place in both test and production environment of application.

6.0 Training for Software Implementation/Capacity Building

1. The vendor should include necessary training methodology, documentation and training materials support in their training plan.
2. The training materials may include user manual, administration manual, quick start tutorial, online help, frequently asked questions.
3. The training plan must describe the sequencing, time, duration and resources involved in implementation of each of the consultant's proposed training activities.
4. The training plan should contain full course descriptions for all courses that to be carried out for respective users.
5. The training instructions should support both English and Bengali language.
6. The vendor also need to propose their smooth, efficient and effective knowledge transfer idea and plan here in this technical proposal with the training plan.

7.0 Maintenance Part

Contracted Firm will ensure post development maintenance, Support, change management and version control services that will include the following:

1. Post development maintenance and troubleshooting support should be provided up to the project period; All the services should be provided for DC, DRS, client end everywhere.
2. Database Administration (DBA) provided by the contracted firm.
3. Software Monitoring and Data Back Up Scheduling should be done in regular basis.
4. Server Configuration whenever needed.
5. Support service types and mode of services
6. Service desk functionalities
7. Configuration management
8. Change management
9. Service layers for support
10. Tools will be used for Support service management.
11. Communication management and modality.
12. Release management.
13. Incident management.
14. Problem management.
15. SLA (Service Level Agreement).
16. Maintenance and support service related reporting.
17. Support service types.
18. Service Log Management
19. Continuous health check of database, tuning database, tuning code and queries and mitigating the issues;
20. Monitor and Receive issues regarding Table, View, Query, Form, Report, User level application related technical problems through the system, troubleshoot and deploy necessary solutions;
21. Fixing bugs in the system irrespective of its nature and complexity;
22. Fixing authentication data entered into system following structured authorization system;
23. Provide active and operation support to data center in application / Database (DB) sizing and adjusting with user-based feedback;
24. Maintenance service Upto 30 September 2021 or upto the end of the Project.

**Apart from the above-mentioned issues, if vendor thinks any other issue to be included in their plan, it would be considered as added value addition.

8.0 Expected Deliverables

Considering the scope of service, the consultant has to submit here a complete list of all types of deliverables that will be produced throughout the entire project timeline whether those are materials, services, applications, source codes, documents, plans, reports etc.

The consultant will submit the following reports in soft and hard copy to NATP-2, DoF as per schedule mentioned below:

- 02 sets of Inception report within two weeks from the agreed commencement date of the service.
- 02 sets of system requirement specification (SRS) reports within the 4th week of the 1st month from the agreed commencement date of the service.
- 02 sets of progress report within the 2nd week of the 3rd month from the agreed commencement date of the service.
- 02 sets of draft final report within the 2nd week of the 4th month from the agreed commencement date of the service.
- Complete Source Code (by DVD) on the 4th week of the 4th month from the agreed commencement date of the service.
- 05 sets of Training materials and user manuals on the 4th week of the 4th month from the agreed commencement date of the service.
- 03 sets of submission of final report on the 4th week of the 4th month from the agreed commencement date of the service incorporating the comments of the client.

The consulting firm also submits the following reports:

1. System design document (SDD)
2. Detail source code documentation
3. Total Software - Design and Development Platform File (Soft Copy)
4. Test plan with test scripts and testing reports
5. Technical documentation (system architecture, module integration points, workflow engine, data dictionary, user manual etc.)
6. Training plan and reports
7. Integration plan and reports
8. Audit log
9. Mobile Application
10. Web application
11. UAT Report
12. Maintenance, agreement & SLA
13. Maintenance and support log
14. Hosting requirement specification, plan and report
15. Implementation plan, Progress report

9.0 Expected Duration

1. 4 months from the signing of the contract.

10.0 Qualification/Experience of the Consulting firm

1. Minimum 5 years of working experiences in ICT business as a registered Company/ Entity with Register of joint stock & companies(RJSC) in Bangladesh;
2. Must submit valid trade license, VAT, updated Income Tax clearance certificate and Certificate of Incorporation, Audit report for the last three years;
3. Companies having experience of working with software solution development related to public service delivery and international experience in relevant area will be an added advantage.
4. Consulting firm needs to have at least one existing running enterprise software solution in Bangladesh in any corporate sector;
5. The intending Software Firm must have experience in successfully development of at least 1 (one) similar type of assignments in donor funded project since 2016;
6. Only Bangladeshi firm will be eligible for submission of application.

11.0 Work Distribution and Team Composition

Table 1: Qualification and Experiences of the Key and nonkey experts

Designation	No. of Persons	Person-Month	Qualification	Experiences
Team Leader	1	4	Minimum B.Sc in computer Science/Engineering/Applied Physics and electronics/EEE or Equivalent from any reputed university	At least BSc in Computer Science or equivalent degree with minimum 15 years' experience in Software Solution Development, Implementation and Software Development Management. Proposed personnel should have minimum 8 years' experience in enterprise project management.
Sr. Programmer (Web Developer)	3	12	Minimum B.Sc in computer Science/Engineering or Equivalent from any reputed university	At least 5 years experience in web based software development. Must have practical experience using Python, Apache, PostgreSQL, Java Script, HTML 5, Responsive Web Design
Web Apps Developer	1	3	Minimum B.Sc in computer Science/Engineering or Equivalent from any reputed university	At least 05 years working experience in Web Apps Development. Must have practical experience using Android/ iOS system.
QA Expert	1	1	Minimum Bachelors in any computer science related discipline	5 years' experience with minimum 03 years' experience in related field.
Technical Document Writer	1	2	Minimum Bachelors in any computer science related discipline	2 years of working experience.

12.0 Selection Method

The Consultant will be selected based on the Quality and Cost Based Selection (QCBS) Method following World Bank Guidelines for "Selection and Employment of Consultants under IBRD loans and IDA Credits & Grants by World Bank Borrowers", January 2011, Revised July 2014.

13.0 Conclusion

The vendor has to provide with an on-line end to end solutions for the 'Development of Website under DoF for Fish Farmers', starting from planning and survey and ends

13.1 Clients Responsibilities

Facilities provided by the client and access to data and Information: Client will arrange the following facilities for the consultant:

• Client and field units would provide data, if available and access to the project related information that may be necessary for the Consultant to carry out its assignment, and facilitate field visits, access to beneficiaries, consultant.
• NATP-2, DoF will arrange available data/maps for the project work as identified by the consultants at the Inception Stage and subsequent project implementation.
• Client will engage technical IT personnel to co-ordinate with consultants developing the system,
• Client will monitor and recommend as per requirements and. standards of its organization.

13.2 Consultants Responsibilities

• The consultant shall carry out the services as detailed in scope of consulting services in the best interest of the Client for the successful realization of the project with the reasonable care, skill and diligence with sound technical, administrative and financial practices and shall be responsible to the Client for the discharge of responsible.
• In performing their duties, the consultant will work under the overall supervision of Senior Assistant Director and Assistant ICT Specialist.
• The technical IT Team of the consultants will co-ordinate and consults with the technical IT personnel of the client in developing the system.

23.12.18

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