

## REQUEST FOR EXPRESSIONS OF INTEREST

<b>Country</b>	: MYANMAR
<b>Project</b>	: Ayeyarwady Integrated River Basin Management (AIRBM) Project
<b>Credit No.</b>	: IDA 55590
<b>Project ID</b>	: P146482
<b>Assignment Title</b>	: Senior River Engineer
<b>Reference No</b>	: C3.15

The Republic of the Union of Myanmar has received interest free loan financing assistance from the World Bank toward the cost of the Ayeyarwady Integrated River Basin Management (AIRBM) Project. Directorate of Water Resources and Improvement of River Systems (DWIR), MoTC is the implementing agency of the AIRBM through the Project Management Unit (PMU) established under the supervision of the secretary of DWIR, and intends to apply part of the credit for consulting services for *Senior River Engineer*.

The PMU now invites expressions of interests from qualified candidates for the below positions. Interested candidates must provide their updated curriculum vitae (CV), indicating personal and technical skills, qualifications and experience in similar assignments. In their expressions of interest, the candidates are requested to indicate the position they apply for and the relevant reference number stated below:

### **C3.15 – Senior River Engineer:**

The Consultant shall meet the following minimum qualifications:

- An advanced degree in civil engineering
- A degree in river/inland waterways design or engineering
- The expert is expected to have at least 15 years of experience in the following areas:
  - River civil engineering sector – especially on infrastructure works such as building groynes and dikes, and dredging works;
  - River and waterway design;
  - River modeling (morphology and hydraulics) for channel design, river and bank stabilization, river hydraulics;
  - Expert in geomorphology and sediment transport, and watershed management.
- He/she must have:
  - Excellent computer skills;
  - Proficiency with Computer Aided Design and Drafting programs such as AUTOCAD, ARCINFO or equivalent software;
  - Proficiency in conducting river modeling and preparing engineering designs, plans, specifications, quantity take-offs, cost estimates, and comprehensive design reports for all of the above features;
  - Experience in providing training in modeling;
  - Excellent knowledge of written and spoken English

- Excellent project writing skills
- Working Experience in the region is an advantage
- Experience with projects funded by international organizations such as the World Bank, the Asian Development Bank, or similar institutions.

In lieu of academic qualification, relevant long-term experience will be considered.

The services are expected to be carried out over a period of 12 months with the possibility of extension.

The location of the service will be at the PMU Office

PMU Office (Building 7)

No.400, DWIR Compound, PMU Office (Building (7)), Lower Pazuntaung Road, Postal Code 11171, Pazuntaung Township, Yangon Myanmar

The attention of interested Consultants is drawn to paragraph 1.9 of the World Bank's *Guidelines: Selection and Employment of Consultants [under IBRD Loans and IDA Credits & Grants]* by World Bank Borrowers dated July 2014 ("Consultant Guidelines"), setting forth the World Bank's policy on conflict of interest.

A Consultant will be selected in accordance with the Individual Consultant method set out in the Consultant Guidelines.

Further information can be obtained at the address below during office hours *0900 to 1700 hours*.

Expressions of interest must be delivered in a written form to the address below (in person, or by mail, or by e-mail) by 22<sup>nd</sup> Mar 2018, 17:00hrs.

AIRBM Project, Project Management Unit

Attn: Ei Kyipyar Soe ( National Procurement Officer )

No.400, Lower Pazuntaung Road, Pazuntaung Township, Yangon, Myanmar

Email: [eikyipyarsoe@gmail.com](mailto:eikyipyarsoe@gmail.com)

With a copy to following e-mail addresses:

[ms.thin.thin.swe.15@gmail.com](mailto:ms.thin.thin.swe.15@gmail.com), [component3director@airbm.org](mailto:component3director@airbm.org)

## TERMS OF REFERENCE

**MINISTRY OF TRANSPORT AND COMMUNICATIONS: DIRECTORATE OF  
WATER RESOURCES AND IMPROVEMENT OF RIVER SYSTEMS**

**AYEYARWADY INTEGRATED RIVER BASIN MANAGEMENT PROJECT**

**TERMS OF REFERENCE FOR**

**C3.15 SENIOR RIVER ENGINEER**

**Duration of assignment:** The Consultant will receive an annual time-based contract with an estimated input of five months for the first year. The contract may be renewed on annual basis depending on Consultant performance and Project requirements.

**General Scope of Services:** Provide technical, management and policy advice on civil engineering and river engineering and navigation to the Project Director and the Component 3 Director. The Consultant shall serve as a member of the Project's Technical Advisory Team.

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### 1. Background

The Myanmar government has received a US\$100 million credit from the World Bank (WB) for the Ayeyarwady Integrated River Basin Management Project (AIRBMP). The objective of the project is help Myanmar develop the institutions and tools needed to enable informed decision making in the management of Myanmar's national water resources and to implement integrated river basin management on the Ayeyarwady, while immediately enhancing the river's productivity with "low/no regrets" investments in the hydro-meteorological observation system and services (to support agricultural productivity and water-related disaster risk management) and in navigation enhancements (to promote sustainable transportation) on the Ayeyarwady. The project would also support a prompt and effective response to potential crises and emergencies. The project will be implemented over the period 2015-2020. A detailed description of the project can found in the World Bank's Project Appraisal Document.<sup>1</sup>

### 2. Component 3 Description

**Component 3: Navigation Enhancement on the Ayeyarwady River** (US\$37.85 million equivalent): The Ayeyarwady River has historically been the main transport artery of the nation but the river's navigability is deteriorating. This deterioration appears to be caused primarily by heavy sediment loads. The annual estimated sediment load in the Ayeyarwady/Chindwin system is roughly 400 million tons making it the fifth most sediment laden river in the world. Sedimentation is perceived to be increasing as a consequence of natural processes as well as human activities such as mining and deforestation in the

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<sup>1</sup> See <http://documents.worldbank.org/curated/en/2014/11/20394428/myanmar-ayeyarwady-integrated-river-basin-management-project>

upstream watersheds. Impacts are seen in increasingly braided channels and sand bars that affect the river morphology and present hazards to inland transport, particularly at night when visibility is compromised and during the low water season (15 November to 15 May) when least available depth for navigation is marginal. The government has identified 46 points of constriction along the river that requires management intervention.

This component is designed to ease navigation constraints and thus improve the inland waterway transport in priority stretches of the Ayeyarwady River and design a cost-effective and environmentally and socially acceptable strategy for managing the full length of the navigation channel.

**Subcomponent 3-1: Navigation Improvements:** (US\$30.35 million equivalent): River navigation improvements will be undertaken to ensure transport safety and efficiency particularly along the busiest section of the Ayeyarwady system which lies between Mandalay and Nyaung Oo (near Bagan). The present depth restriction for the Mandalay to Nyaung Oo section during the dry seasons is much less than the required 1.5 meters for proper navigation. Depth improvements will allow larger and more heavily loaded vessels to ply during dry seasons, increasing the efficiency of passenger and cargo transport.

This sub-component has been designed in partnership with the Dutch government who are financing a consultancy that will update the 1988 World Bank and UNDP-financed Irrawaddy and Lower Chindwin River Study on inland water transport, as well as identifying and providing detailed designs for the first phase of navigation improvements (activity 3.1.c) and recommending an operations and maintenance plan. This sub-component will include the following activities:

(a) Navigation channel modelling, detailed design and construction supervision: Three main tasks will be included in this activity:

- Task 1 - Navigation channel modeling: The 2-dimensional model financed by the Dutch government will be extended to cover the entire river section from Mandalay to Yangon. The scope of works for river navigation enhancements, including the locations of the river training (groins) and bank protection works as well as the sections that require dredging, will be identified under this task. Targeted sedimentation modeling will also be developed under this Task to manage the sedimentation process along the enhanced channel from which a Maintenance Plan will also be prepared.
- Task 2 – Preparation of detailed design and bidding documents: based on the results under Task 1, detailed design document will be prepared for all the proposed enhancement works. The first phase of navigation enhancements works will focus on the Mandalay to Nyaung Oo section of the Ayeyarwady. Enhancements will likely include a series of groins, gabions and other minor river works not anticipated to have ‘over-bank’ impacts, as well as bank protection and dredging. This task would include:
  - (i) preparation of detailed engineering design for the navigation enhancement works on the remaining Mandalay – Nyaung Oo section, including river training works, dredging and bank protection;
  - (ii) design of navigation aids for full Mandalay – Yangon river section with 24-hour navigation focused for the Mandalay – Nyaung Oo stretch;
  - (iii) estimation

of the costs for the designed works and packaging for the bidding process; (iv) preparation of bidding documents for those packages; and (v) proposals for improvement works at some key inland ports. Detailed design for some most critical sections downstream of Nyaung Oo will also be included in this Task so the bidding process could start immediately if there are potential cost savings from bids for works under Mandalay – Nyaung Oo section.

- Task 3 - Construction Supervision: supervise construction for the entire enhancement works implemented.

(b) Preparation of ESIA/ESMP for navigation improvement works will be undertaken based on the scope of works identified under 3.1.a. Other safeguard plans, such as RAPs and IPPs, will also be prepared if needed following WB policies and the project ESMF.

(c) Construction of river navigation improvement works. This activity will include the implementation of enhancement works along the Mandalay – Yangon stretch and improvement of inland port infrastructures (if any, and subject to funds availability.) Enhancement works for first phase stretch of 30km near Mandalay will be implemented by the DWIR using the Force Account method.

**Subcomponent 3-2: Navigation Aids** (US\$3.4 million equivalent): Mandalay to Yangon with night navigation focused on Mandalay – Nyaung Oo section. Existing navigation aids are useful only for daytime navigation and need to be modernized to better meet the channel navigation demand. Most navigation aids are currently of a temporary nature, such as bamboo rods, and need to be upgraded to more permanent equipment such as metal buoys, some of which should be lighted for night navigation. Providing modern navigation aids for the whole river section from Mandalay to Yangon, with night navigation aids focused on Mandalay to Nyaung U section and other safety and efficiency improvements, will enhance income generating opportunities for both inland water transport and green/river tourism businesses. This sub-component will include:

(a) Purchase and installation of navigation aids: Bids will be invited to purchase and install the navigation aids designed under Activities 3.1.a above. Aids may include signage, buoys, lighting, mapping, a system of government river-pilots and a hopper-dredger (operated by the government or the private sector) for immediate response to river obstructions. Training for DWIR staff will be included in this contract to sustain the DWIR's capacity during the O&M stage.

(b) Survey and pilotage services: Equipment, such as survey boats, echo-sounding equipment and radar will be purchased to support DWIR in undertaking survey work and providing routine pilotage services.

**Subcomponent 3-3: Water Quality Monitoring** (US\$2 million equivalent)

Design and pilot operation of a surface water quality monitoring network. This sub-component will include the design and pilot operation of a water quality monitoring system

for the Ayeyarwady River Basin. Currently, there is a lack of reliable and systematic information on surface and groundwater quality. There is a clear need to develop a legal and regulatory basis defining national goals, objectives and standards related to protection and evaluation of quality of water resources as well as to define institutional mandates and responsibilities including formulation of clear DWIR mandate and responsibilities for water quality monitoring. The sub-component will finance hiring of international experts to develop a program for water quality screening in the Ayeyarwady River basin and develop initial proposals for a pilot system. The screening will include: (a) clearly defined objectives, use of relevant WQ standards, selection of key physical, chemical and/or biological indicators; and (b) assessment of key river reaches and potential “hot” spots of potential high contamination or degraded ecosystems, during main seasons with low flow and high flow. The process will be supported by relevant quality assurance/quality control procedures of sampling, handling, and chemical and/or biological analysis and reporting. The reporting formats and evaluation techniques should be defined prior to the screening.

**Subcomponent 3-4: Institutional Strengthening and Implementation Support (US\$2.1 million equivalent).** This sub-component will include the following activities:

- (a) Institutional and implementation support. Technical assistance and incremental operating costs will be provided to support the CMU for Component 3 to manage and monitor this Component.
- (b) Fleet optimization study: The forecasted increase in traffic will require additions to the fleet even if river and port improvement are constructed and night navigation is introduced. This activity will help ensure that vessel designs are well suited to the river and optimize the composition of the fleet in order to maximize the efficiency of the inland waterways transportation from a fleet development perspective.
- (c) Capacity building, training and awareness raising. Training will be provided to government staff and river users where new signs, regulations and services are introduced. Communications and outreach to river users groups will be undertaken to raise awareness of the improvements made under this component. Gender considerations will be integrated in the training and communication/outreach to staff and river users.

### **3. Project Management Structure**

**Department of Water Resources and River Improvements (DWIR) and NWRC Secretariat:** The project falls under the general auspices of the National Water Resources Committee (NWRC). The Director General of DWIR serves as the Secretary of the NWRC Secretariat. Component 3 of the Project is the direct responsibility of DWIR. The Director General/Secretary’s dual role should help to ensure coordination among different entities.

**The AIRBM Project Steering Committee (PSC):** The NWRC will provide strategic guidance to the AIRBM and receive regular updates on progress. For purposes of immediate project oversight, an AIRBM Project Steering Committee (PSC) will be formed from the NWRC to review and advise on annual progress reports, work programs and key processes and outputs. The PSC will be chaired by the Deputy Minister, Ministry of Transport, which

consists of Director General of DWIR, Director General of DMH and Chairperson of Advisory Group.

**Project Management Unit (PMU):** A PMU has been established under DWIR/NWRC Secretariat, and is led by a Project Director. The general structure of the PMU is presented in Annex A. The Project Director will be responsible for project management and technical coordination, as well as procurement and financial management, monitoring and evaluation, and compliance with environmental and social safeguards for all project components. Financial management and procurement functions will be undertaken by existing staff of DWIR, with additional support from consultants to be hired under the project as needed. The PMU offices is located together in Yangon, with satellite offices at DWIR and DMH in Nay Pyi Taw.

**Component 3 Management:** The PMU includes a section specifically responsible for implementing the component. This section is led by the Component 3 Director, who is a Deputy Director of DWIR responsible for navigation, and has overall leadership for implementation and serves as the primary management link with the PMU. The Component 3 Director will be assisted by a small group of professionals who also form part of the PMU. The main Navigation Advisor to Component 3 is already on board. As there are a number of civil engineering and river engineering aspects in this component it was decided to offer a one year contract to a Civil Engineer with high expertise in Waterway Design, Modeling and Engineering.

#### **4. Consultant Assignment Objectives and Scope**

The overall scope of the assignment is to provide services to support the Component 3 Director to deliver the component's outcomes in the timely manner and in conformity with the requirements of the Government of Myanmar as well as the World Bank. General tasks include the following:

**1. Provide Technical Leadership and Advice for Component 3 on river engineering:** The Consultant shall work closely with the main International Advisor to C3, and under the direct supervision of the Component 3 Director, to achieve the outcomes and objectives of the Component as described in Section 2 of this TOR.

**2. Serves as Member of the Project Advisory Team:** As shown in Annex A, there are seven members of the PMU Advisory Team. The consultant is expected to primarily support Component 3 of the Project, but will also help ensure the overall quality and integration of the Project as and when necessary under the direction of the Project Director.

**3. Procurement and Contract Management and Supervision:** The Consultant shall assist the PMU and the Component Director, as and when requested, in matters related to procurement and contract management, including but not limited to:

#### Consultant Contracts:

- Provide technical inputs and/or review TORs and Requests for Proposal (RfP)
- Assist evaluation teams and prepare evaluation reports
- Assist contract negotiations
- Prepare correspondence for the World Bank and the Government of Myanmar.
- Evaluate the findings of related studies for project component 3.
- Supervise the consultants with respect to products and quality

#### Works and Goods Contracts

- Prepare technical specifications for works or goods contracts
- Assist evaluation teams and prepare evaluation reports
- Contract finalization discussions for works and good contracts
- Prepare correspondence for the World Bank and the Government of Myanmar.
- Supervise the works and goods contracts and ensure compliance with respect to contractual requirements.

**4. Project Reporting, Budgeting, and Management:** The Consultant shall assist the PMU and the Component Director, as and when requested, in matters related to project reporting, development of procurement plans, formulation of work plans, review of financial management reports, etc.

#### 5. Consultant Experience Requirements

The Consultant shall meet the following minimum qualifications:

- An advanced degree in civil engineering
- A degree in river/inland waterways design or engineering
- The expert is expected to have at least 15 years of experience in the following areas:
  - River civil engineering sector – especially on infrastructure works such as building groynes and dikes, and dredging works;
  - River and waterway design;
  - River modeling (morphology and hydraulics) for channel design, river and bank stabilization, river hydraulics;
  - Expert in geomorphology and sediment transport, and watershed management.
- He/she must have:
  - Excellent computer skills;
  - Proficiency with Computer Aided Design and Drafting programs such as AUTOCAD, ARCINFO or equivalent software;
  - Proficiency in conducting river modeling and preparing engineering designs, plans, specifications, quantity take-offs, cost estimates, and comprehensive design reports for all of the above features;
  - Experience in providing training in modeling;

- Excellent knowledge of written and spoken English
- Excellent project writing skills
- Working Experience in the region is an advantage
- Experience with projects funded by international organizations such as the World Bank, the Asian Development Bank, or similar institutions.

## **6. Contractual Arrangements and Consultant Reporting Requirements**

Consultant will be based in Yangon, at the PMU office, and is expected to travel extensively within the country. Part-time home based work may also be required. The key Consultant Reports shall include:

Inception Report: Within one month of signing. The Inception Report shall confirm the scope and objectives of the assignment, proposed any necessary adjustments, and layout a detailed monthly reporting format (the monthly report can be changed to a Bi-Monthly Report if so agreed by the parties).

Bi-Monthly Reports (i.e. every two months): The key contract control mechanism for the PMU shall be the Bi-Monthly Report. The Report shall specify the actual amount of day's worked, actual reimbursable expenses, and a detailed explanation of any significant deviations from the work plan presented in the previous Report. The Report shall present a detailed work plan for the upcoming period, including consultant inputs and expenses. Approval of the Report will be linked to payment of the Consultant's invoices.

Final Report: The Final Report will occur at the end of the assignment, summarize the Consultant's inputs, expenses, and results. Acceptance of the Final Report shall constitute closure of the Consultant's contract.

Technical Notes and Memorandum As Requested: Prepare specific technical reports as and when requested by the Component Director.

## Annex A: General PMU Structure (Subject to Change and Modification)

### PMU Organizational Structure

