

**Directorate of Water Resources and Improvement of River Systems**

**MYANMAR AYEYARWADY INTEGRATED RIVER BASIN  
MANAGEMENT PROJECT**

**ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK  
DRAFT EXECUTIVE SUMMARY**

**Yangon, August 2014**

## **1 INTRODUCTION**

An Environmental and Social Management Framework (ESMF) was prepared by Directorate of Water Resources and Improvement of River Systems (DWIR) to cover the environmental assessment process and related social safeguard policies for investments financed under the Myanmar Ayeyarwady Integrated River Basin Management Project (AIRBMP). The ESMF provides a general option impact analysis with environmental and social criteria and an overall assessment on how to mitigate and monitor possible environmental and social effects affiliated with these investments.

The ESMF provides guidance on the process of proper project implementation including preventing, minimizing or mitigating possible site-specific environmental and social impacts during the investments. It provides guidance to all the sub-project sponsors, beneficiaries and DWIR to ensure the environmental and social assessment and other safeguard requirements will be carried out in compliance with the national guidelines for conducting Environmental Impact Assessments (EIA), other environmental and social regulations and laws of Myanmar, and in accordance with the World Bank Environmental Assessment (EA) and social policies and procedures on involuntary resettlement and indigenous peoples as specified in the World Bank Group safeguard policies. The ESMF will also be used as a reference document for assessing the potential environmental and social impacts of investment alternatives or strategies that are assessed and financed under this program. Finally, this ESMF will be an integrated part of the Project Implementation Manual (PIM) and is applicable to all linked investments financed for Ayeyarwady River Basin, regardless of their funding source or implementing agency.

### **Project Description**

The proposed Myanmar AIRBMP funded by the World Bank through a loan of US\$ 100 million and implemented by DWIR is designed as a multi-phased approach (Series of Projects) to strengthen integrated, climate resilient management and development of the Ayeyarwady River Basin and national water resources. The first phase aims at developing the institutions and tools needed to implement integrated river basin management, and deliver related livelihood benefits from enhanced navigation and hydromet warning and advisory services. Specific project locations for interventions linked to navigation enhancements and hydromet warning on the Ayeyarwady from Mandalay to Yangon will be selected and identified during project implementation once the relevant modeling and feasibility studies are developed.

The proposed first phase will also lay the groundwork needed to undertake large-scale infrastructure investments in possible second or third phases (yet to be determined) and financed primarily under the project preparation of future investments subcomponent. It will provide the government with the capacity to do basin-wide scenario analyses, to properly identify and assess the complex trade-offs that inevitably arise from large, long-lived water infrastructure investments, and to follow economic, environmental and social 'good practices'. Therefore, the first phase will also support (pre-) feasibility, feasibility and other upstream technical studies for priority infrastructure investments that will be primarily identified in the course of a basin planning framework (master plan) for potential funding in subsequent phases. A Strategic Environmental and Social Assessment will be undertaken in parallel with the preparation of, and

to inform, the river basin master plan during project implementation in line with specific ToRs already developed as part of project preparation.

## **Component 1: Water Resource Management Institutions, Decision Support Systems & Capacity Building**

Subcomponent 1.1. Institutional Development: This sub-component will support (a) construction or refurbishment of a NWRC Secretariat and Hydro-Informatics Center headquarters facility including provision of office furnishings and equipment, (b) establishment and delivery of the mandates of the newly created NWRC Secretariat, Hydro-Informatics Center and Expert Group, including institutional, legal and regulatory reviews and reforms, (c) creation of a stakeholder forum, communications and outreach, and (d) capacity building.

Subcomponent 1.2. Ayeyarwady Integrated River Basin Master Plan and Decision Support System: This sub-component will provide immediate guidance on investment options while also developing the tools and processes needed to ensure the government has ongoing capacity to plan and manage its water resources. A phased approach will be taken to plan integrated development of the Ayeyarwady River, based on sufficient understanding of opportunities and risks and guided by agreed sustainable development objectives. Activities include (a) development of the Ayeyarwady Master Plan, basin-wide diagnostic studies, a Decision Support System (DSS), and stakeholder consultations, (b) implementation of a groundwater survey, and (c) development of Basin-wide Strategic Environmental and Social Assessment.

Subcomponent 1.3. Preparation of Future Investments (PFI): The PFI will provide finance to support the preparation of priority projects identified in the Ayeyarwady Basin Master Plan (Sub-component 1.1a). To be eligible for funding, a project must be on the Government's approved list of ODA projects and be consistent with the Bank's engagement objectives in Myanmar. Under this sub-component, funds will be made available to prepare investments to international quality standards and in accordance with basin wide development objectives. The preparation funds will be available for the duration of the five-year AIRBM implementation period.

Subcomponent 1.4. Implementation Support: This sub-component will provide incremental running costs and consultant and advisory services for overall project management, financial management, procurement, safeguards and monitoring and evaluation.

## **Component 2: Hydromet Observation and Information Systems Modernization**

Subcomponent 2.1. Institutional and Regulatory Strengthening, Capacity Building and Implementation Support of DMH: This sub-component will support (a) institutional strengthening of the DMH including the development of a robust legal and regulatory framework, (b) capacity building and training for DMH staff, and (c) technical assistance in DMH systems design, integration and operations as well as Component 2 management and monitoring.

Subcomponent 2.2. Modernization of Observation Infrastructure, Data Management Systems and Forecasting: This sub-component will support (a) technical upgrading of the hydro-meteorological observation network, (b) modernization operations centers, data management and communications/IT systems, engineering and calibration facilities, (c) improvements in numerical weather prediction systems and associated hydrological modeling frameworks, (d) design and piloting of surface water quality monitoring system, and (e) reconstruction and/or refurbishment of DMH facilities.

Subcomponent 2.3. Enhancement of the Service Delivery System of DMH: This sub-component will support DMH in strengthening its service orientation in order to ensure project benefits are realized across the range of stakeholders. This will likely include (a) enhancement of Public Weather Services and Hydrological Services and improvement of service delivery to communities, (b) support for DRM operations including expansion of "end-to-end" early warning systems in small river basins with floods and flash floods, (c) development of an Agricultural and Climate Advisory Service (ACAS), and (d) the creation of a National Framework for Climate Services.

### **Component 3: Ayeyarwady River Navigation Enhancements**

Subcomponent 3.1. Ayeyarwady River Navigation Strategy (Mandalay to Yangon): This sub-component will develop (a) a navigation strategy for the full navigable length of the river from Mandalay to Yangon. This strategy will (i) update the currently referenced 1988 feasibility study for the entire river taking into account potential inland port developments to promote multi-modal transport planning in the future, (ii) identify the scope of works for navigational improvement including training works, dredging, bank protection and navigation aids on the two most urgent bottleneck stretches of about 30km each, (iii) provide detailed design for pilot training works at two stretches, (iv) and recommend a maintenance plan for the river (linked with sub-component 3.2.c.) and (b) a fleet optimization study.

Subcomponent 3.2. Navigation Improvements (Mandalay to Yangon with a focus on the Mandalay - Nyaung Oo section): This sub-component will support navigation improvements to increase the least available draught during the low water season for both passenger and cargo vessels along the busiest stretch of the Ayeyarwady river (Mandalay to Nyaung Oo). Activities will include: (a) 1-dimensional and 2-dimensional river modeling to identify the scope of works for river navigation enhancements, (b) preparation of an EIA, including an EMP for the proposed enhancement works, (c) preparation of detailed design documents and construction supervision, and (d) construction of enhancement works. The scope of works will be focused on the Mandalay – Nyaung Oo stretch of the Ayeyarwady and will be expanded to some other critical stretches on the Nyaung Oo – Yangon reach.

Subcomponent 3.3. Navigation Aids (Mandalay to Yangon with night navigation focused on the Mandalay – Nyaung Oo section): This sub-component will support the purchase and installation of navigation aids such as lighting, signage, mapping and a strengthened river pilot system to enhance safety and facilitate efficient navigation along the Mandalay – Yangon section of the Ayeyarwady. In addition it will support investments, for example in lighting and signage, to enable night navigation on the Mandalay – Nyaung Oo section.

**Subcomponent 3.4. Institutional Strengthening and Implementation Support:** This component will support (a) Component 3 implementation and management, and (b) capacity building, training and communications and awareness raising activities on river improvements and new information, regulations and procedures.

#### **Component 4: Emergency Contingency Response**

This ‘zero component’ (initially without any allocations of funding) will allow for the rapid reallocation of funds from other components to provide preparedness and rapid response support to disaster, emergency and/or catastrophic events, as needed. The funds flow and disbursement arrangements will be determined at the time that a contingency response is activated.

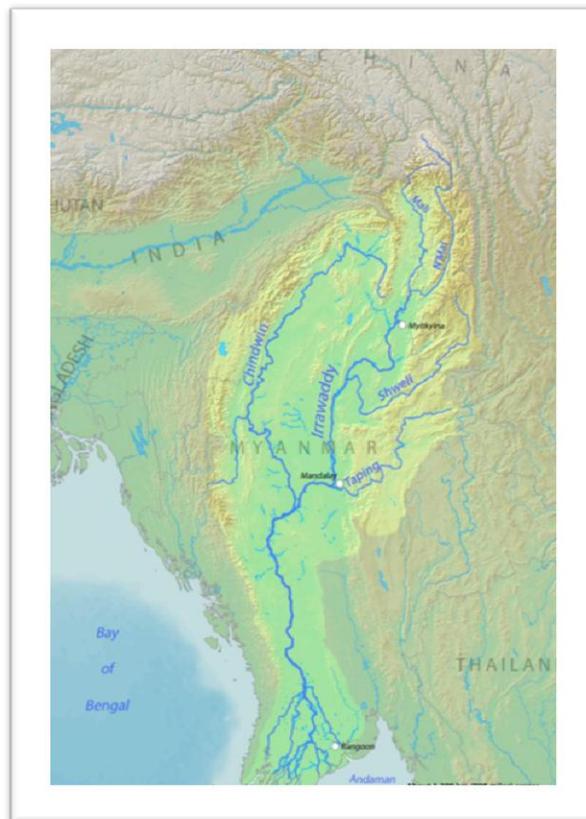
## **2 BRIEF PROJECT BASELINE INFORMATION**

### **The Ayeyarwady River Basin**

The Ayeyarwady River (also known as Irrawaddy; length 2170 km; drainage area 413,710 Km<sup>2</sup>) is the largest river in Myanmar and has been described as the heart of the nation. The basin accounts for over 60% of Myanmar’s landmass, accommodates 70% of its population, and transports 40% of its commerce. Groundwater resources in the basin are believed to be even greater than surface water resources. It is rich in natural resources particularly forests, land and water in addition to biodiversity.

#### ***Natural Resources***

The Ayeyarwady basin is an international waterway rising in the Himalayas, bisecting Myanmar from north to south and emptying through a nine-armed delta into the Bay of Bengal. The average discharge of the Ayeyarwady River is 13,000 m<sup>3</sup>/s (Win, 2011). The combined flow outside of Myanmar is estimated to be less than 1%. The remaining 99% of the flow is accumulated within Myanmar, which is the river’s downstream most riparian country. The international section of the catchment, a portion feeding two of the tributaries of the River (the Maykha and the Malikha) is located in China. Also, a sub-tributary originating within India feeds the Malikha tributary. The confluence of both tributaries (Myitstone in Myanmar language) is situated at a place approximately 45 km north of Myitkyina, in Kachin State in northern Myanmar. From there on, the river is called the Ayeyarwady.



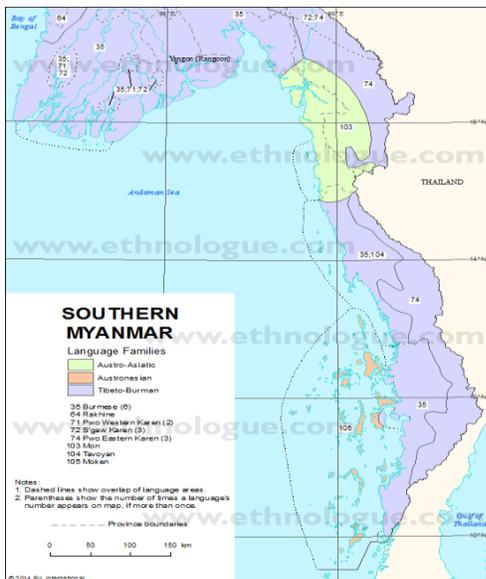
Large part of the water, energy and food security of Myanmar depends upon the Ayeyarwady river basin. Therefore the ecosystem of the Ayeyarwady River Basin plays a crucial role as the lifeline of Myanmar populace. Achieving sustainable development of these resources is vital to the country and the sustainability of water, energy and food security in Myanmar.

There are an estimated 517,000 ha of mangrove forest in Myanmar, of which 46% are located in Ayeyarwady Delta (Ramsar, n.d.). In the Ayeyarwady Region, mangrove forest has been seriously degraded in recent years due to agricultural conversion and the high demand for firewood and charcoal from Yangon, with consequent decline of fish catches and increased vulnerability to natural disasters. It has been estimated that ~83% of mangroves in the Ayeyarwady Delta have been destroyed between 1924 and 1999 (NECC, 2012). The Ayeyarwady river also has extensive wetlands in the interior of the country, which are mostly seasonally inundated floodplains, most of which have been reclaimed for permanent agriculture.

The swamp forest, found in the Ayeyarwady Delta is of high ecological importance for many bird species, which have suffered dramatic population declines across their global distributions. The Ayeyarwady River also has extensive wetlands in the interior of the country, which provide excellent feeding areas for large number of waterfowl and fertile spawning grounds for a number of fishes, such as carp, catfish and perch. As mentioned above, large areas of this floodplain have been reclaimed for permanent agriculture

### ***Socio-economic Setting***

The total population of Myanmar is estimated to be around 50 million although the number varies between sources of data. About 75% of population is considered to live in rural areas. Average household size is 5, with little difference between rural (5.0) and urban (4.9) areas. There are more than 60,000 villages. Various studies indicate that poverty stands above 20% at the national level, while poverty incidence is higher in rural areas by about 5 percentage point.



Myanmar is one of the most ethnically diverse countries in south East Asia. The Bamar is the largest ethnic group, comprising around two-thirds of the population, and various ethnic minorities accounting for about one third. The majority Bamar population mainly lives in the central and delta regions (divided into seven Regions) while the ethnic minorities live mainly, however not exclusively, in the seven States (Kayah, Kayin, Kachin, Chin, Mon, Rakhine, and Shan) along the borders. The official population estimates of the main ethnic minority groups are roughly: Shan (9%), Kayin/Karen

(7%), Rakhine (4.5%), Chin (2%), Mon (2%), Kachin (1.4%), Kayah (1%). The eight “ethnic races,” including the majority Bamar are subdivided into 135 officially recognized ethnic groups and belong to five linguistic families (Tibeto-Burman, Mon-Khmer, Tai-Kadai, Hmong-Mien, and Malayo-Polynesian); there are no population figures for ethnic minority sub-groups.

The Ayeyarwady River Basin is known to be a home to diverse ethnic groups. Numerous ethnic groups are present within the river basin although data do not exist that clearly show the list of ethnic groups who are present. The Strategic Environmental and Social Assessment (SESA) will collect more data on the distribution of ethnic minorities in river basin at the early stage.

### **3 PROJECT LEGAL AND INSTITUTIONAL FRAMEWORK**

#### **Legal Framework relevant to project activities**

The Government of Myanmar (GoM) is currently in the process of updating and developing its Environmental legal and institutional framework. However, numerous challenges remain. Myanmar Environmental policies and laws are mostly sectoral and are gradually transitioning from a nature conservation focus to environmental mainstreaming into the economic and social development of the country.

Sector specific laws - where developed - regulate only particular environmental aspects. Therefore, there are no laws that comprehensively regulate strategic aspects such as environmental impact assessment, waste management, involuntary resettlement, or particular measures for vulnerable groups such as ethnic minorities. Sectoral laws also produce overlapping of certain responsibilities (e.g. licensing for works on river ways fall under both Ministry of Transportation and Ministry of Environmental Conservation and Forestry). Myanmar is party to several international treaties, however the incorporation of those provisions into domestic law has been somewhat fragmented.

The legal and institutional gap also extends into administrative and procedural structures, and capacity and resources to enforce such provisions. There is also a need for better coordination between sectoral ministries and between union and local government. Some members of Myanmar Civil Society have argued that the lack of environmental protection legislation and enforcement capacity has left room for unabated ecological degradation.

#### *Legal framework concerning ethnic minorities*

According to Chapter 1, clause 22 of the 2008 Constitution of Myanmar, the Union Government of Myanmar is committed to assisting in developing and improving the education, health, language, literature, arts, and culture of Myanmar’s “national races.” It is stated, that the “Union shall assist:

- a) To develop language, literature, fine arts and culture of the National races;
- b) To promote solidarity, mutual amity and respect and mutual assistance among the National races;

- c) To promote socio-economic development including education, health, economy, transport and communication, [and] so forth, of less-developed National races.”

The constitution provides equal rights to the various ethnic groups included in the national races and a number of laws and regulations aim to preserve their cultures and traditions. This includes the establishment of the University for the Development of the National Races of the Union which was promulgated in 1991 to, among other things, preserve and understand the culture, customs and traditions of the national races of the Union, and strengthen the Union spirit in the national races of the Union while residing in a friendly atmosphere and pursuing education at the University.

Under the current government, free media is developing and ethnic parties and associations are politically active. Ethnic minority organizations may also play a stronger role going forward through the current Government’s decentralization efforts which would afford States and Regions to play a more prominent role in decision-making and implementation of various policies and programs.

### **Institutional Framework relevant to project activities**

The Ministry of Environmental Conservation and Forestry (MOECAF) is the focal agency for environmental management in Myanmar. MOECAF’s predecessor, the Ministry of Forestry (MOF) created in 1992, had been gradually taking over the coordination of environmental protection in Myanmar. In 2005, the MOF absorbed the 1990 National Commission for Environmental Affairs (NCEA), the main environmental authority at the time, composed by nineteen heads of departments from various sectoral ministries. In 2012, NCEA became one of the six departments under the MOECAF, the Environmental Conservation Department, which main objectives include: (i) implementing National Environmental Policy, strategy, framework, planning and action plan for the integration of environmental consideration into in the national sustainable development process; (ii) managing natural resources conservation and sustainable utilization, the pollution control on water, air and land for the sustainable environment; and (iii) cooperating with other government organizations, civil society, private sectors and international organizations concerning with environmental management.

The GoM established in 2004 the National Environmental Conservation Committee (NECC) aimed at consolidating the environmental conservation activities at local and national levels. NECC, chaired by the Ministry of Forestry, was reformed in April 2011 to include 21 members from 19 ministries. NECC is divided in four sub-committees, one of which aims at addressing the environmental problems in rivers and wetland areas.

MOECAF priority actions include creating: (i) guidelines for environmental quality standards and pollution control; (ii) EIA procedures and guidelines as well as review and monitoring institutions; (iii) Environmental and Water Management Master Plans; (iv) Climate Change strategy and Emergency Risk Management Plan; (v) Green Economy Strategy for low carbon development; and (vi) Environmental Monitoring programs and inspections rules and regulations. The principal constrains identified by MOECAF include: (i) lack of information, (ii) lack of technical expertise, (iii) lack of financial resources

and sustainability, (iv) lack of coordination both within and between government institutions and well as national and local entities, (v) challenges around public participation, and (vi) time limits.

The other important sectoral agencies in the area of environmental and water resources management are the Ministry of Health (MOH), the Ministry of Agriculture and Irrigation (MOAI), the Ministry of Social Welfare, Relief and Resettlement (MSWRW), and the Ministry of Livestock and Fisheries (MOLF). In recent years, the MOH has been incorporating environmental health activities such as surveying for toxic and hazardous materials, monitoring occupational health linked to environmental pollution, and improving clean water supply and sanitation. The Relief and Resettlement Department and the Myanmar Disaster Preparedness Agency, under MSWRR, are tasked with the implementation of the Myanmar Action Plan on Disaster Risk Reduction, which includes water monitoring, early warning systems and flood control activities, among others. The Water Resource Utilization Department and Irrigation Department under MOAI work in improving water supply for irrigation purposes. The Department of Fisheries under MOLF is responsible for not only fishery resource management but also fish diversity conservation in both fresh water and marine environments. Table 1 highlights various agencies with different tasks related to water resources management.

**Table 1 Agencies with water resources management responsibilities**

Agency	Water Resources Management Responsibilities
Irrigation Department	Responsible for: (i) agriculture water supply for irrigation Development, (ii) to some extent, urban water supply, and (iii) preventing of saline water intrusion, (iii) water level recording and discharge measurement, especially for irrigation dams and canals
Meteorology and Hydrology Department	Responsible for (i) weather/water monitoring stations, sediment discharge stations on main rivers and big tributaries, (ii) water quality stations on Ayeyarwady delta for measuring discharge and sediment flows and monitoring salt intrusion
Forest Department	Responsible for rehabilitation and conservation of forests and watersheds and maintaining the stability of Environment in order to develop the social and economic conditions of the nation, especially in rural areas
Water Resource Utilization Department (WRUD) under MOAI	Responsible for pumping up water from rivers for irrigation purposes.
Department of Water Resources and Improvement of River Systems (DWIRS)	Responsible for improving water ways, canals and river systems for a variety of issues including navigation, sedimentation and water quality purposes.
Municipal bodies like Yangon, Nay Pyi Taw, Mandalay City Development Committees (YCDC, MCDC ) and Township Development Committees (TDC)	Gradually taking over the responsibility for urban water supply.
Department of Health	Partially responsible for some aspects related to rural water supply and sanitation linked to health facilities' operation.

### **World Bank Group Safeguard Policies**

The proposed project investments are expected to be designed to have generally positive social and environmental benefits and will trigger several World Bank policies such as *Environmental Assessment* (OP 4.01); *Natural Habitats* (OP 4.04); *Physical Cultural Resources* (OP 4.11), *Safety of Dams* (OP

4.37), *Involuntary Resettlement* (OP 4.12) and *Indigenous Peoples* (OP 4.10). The project has been classified as environmental category “A” in accordance to the World Bank policy OP/BP 4.01 on *Environmental Assessment* given the possible high environmental and social risk impacts affiliated with the project interventions and the overall complex impact of the project focused on an integrated river basin planning approach. However, specific infrastructure investments (once identified in terms of location, characterized for their technical complexity and assessed in view of their impact) may qualify for category “B” and/or category “A” impact subprojects. Other activities supported by the project, such as the undertaking of prefeasibility, feasibility and other studies also need to review and assess potential environmental and social impacts of the activities and alternatives considered on a case-by-case basis.

Currently, there is no environmental and social impact assessment framework in Myanmar. The GoM drafted in 2001 a set of Environmental Impact Assessment rules, but they have yet to be enacted. The 2012 Conservation Law provides a general mandate to MOECAF to produce an ESIA system but specific ESIA procedures and guidelines are yet to be endorsed. EIAs are conducted, however, on an ad hoc basis for projects funded by international organizations and some foreign corporations. The EIA challenges also expand into the institutional framework with a MOECAF with little technical and financial resources to review and monitor environmental and social performance of investment projects on the ground. Table 2 summarizes the main aspects of the draft EIA rules vis a vis the OP 4.01 procedures. Myanmar does not have a unitary law or legislation with regard to land acquisition and compensation or on ethnic minorities.

**Table 2 National Draft EIA rules versus OP/BP 4.01 EIA requirements**

Issue	Draft EIA Rules	OP 4.01
Triggers	Projects with significant environmental impact	All projects financed by the World Bank. EA process depth will depend on the risk and impacts associated with the Project.
Responsibilities	Project proponent leads the EA process	Borrower leads the EA process
Public participation	MOECAF shall arrange as it deems necessary for Public Participation. In the process of approving the EIA report, MOECAF shall take into account suggestions from project affected people and civil society. However, the rules do not specify the process of receiving feedback or incorporating it into the proposed project.	For all Category A and B projects, during the EA process, the borrower consults project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental and social aspects and takes their views into account. The borrower initiates such consultations as early as possible. For Category A projects, the borrower consults these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized; and (b) once a draft EA report is prepared. In addition, the borrower consults with such groups throughout project implementation as necessary to address EA-related issues that affect them.

Disclosure	<p>The Project proponent shall disclose all relevant project information to MOECAAF.</p> <p>No further requirement of disclosure to project affected people or civil society is made in the EIA rules.</p>	<p>The borrower provides relevant material in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted.</p> <p>For a Category A project, the borrower provides for the initial consultation a summary of the proposed project's objectives, description, and potential impacts; for consultation after the draft EA report is prepared, the borrower provides a summary of the EA's conclusions. In addition, for a Category A project, the borrower makes the draft EA report available at a public place accessible to project-affected groups and local NGOs</p> <p>Any separate Category B report is made available to project-affected groups and local NGOs. Public availability in the borrowing country and official receipt by the Bank of Category A reports, and of any Category B report, are prerequisites to Bank appraisal of these projects.</p> <p>Once the borrower officially transmits the Category A EA report to the Bank, the Bank distributes the summary (in English) to the executive directors (EDs) and makes the report available through its InfoShop. Once the borrower officially transmits any separate Category B EA report to the Bank, the Bank makes it available through its InfoShop.</p> <p>If the borrower objects to the Bank's releasing an EA report through the World Bank InfoShop, Bank staff (a) do not continue processing an IDA project, or (b) for an IBRD project, submit the issue of further processing to the EDs.</p>
Screening	<p>Lists projects that require environmental examination including land use change, exploitation of resources for introduction of new species.</p> <p>MOECAAF shall determine the format and timing of the reports. MOECAAF will determine the type of environmental assessment required based on the environmental examination</p>	<p>The Bank screens all projects and classifies them into one of four categories (Category A, B, C, and FI), depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts</p>
EA Content	<p>MOECAAF determines the content of the EA report, which primarily includes assessment of direct impacts linked to project and description of mitigation measures (environment mitigation plan).</p>	<p>The EA needs to include assessment of project alternatives; cumulative impacts; specific mitigation measures and monitoring activities.</p>

Monitoring	<p>MOECAAF shall monitor project performance in accordance to the Environmental Management Plan (EMP).</p> <p>The Project proponent shall comply with the EMP and the terms included in the license throughout the lifetime of a project.</p> <p>If found in non-compliance, MOECAAF shall impose penalties or suspend project construction or operation.</p>	<p>During project implementation, the borrower reports on (a) compliance with measures agreed with the Bank on the basis of the findings and results of the EA, including implementation of any EMP, as set out in the project documents; (b) the status of mitigatory measures; and (c) the findings of monitoring programs. The Bank bases supervision of the project's environmental aspects on the findings and recommendations of the EA, including measures set out in the legal agreements, any EMP, and other project documents</p>
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In addition, the AIRBM project investments will follow the WBG Environmental, Health, and Safety (EHS) Guidelines, which are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). The applicability of the EHS Guidelines should be tailored to the hazards and risks established for each investment on the basis of the results of an environmental assessment in which site-specific variables, such as local country context, assimilative capacity of the environment, and other sub-project factors, are taken into account. The assessment of the range of pollution prevention and control techniques available to an investment may include, but are not limited to, varying levels of environmental degradation and environmental assimilative capacity, as well as varying levels of financial and technical feasibility. Gap analysis between national legislation and the Bank's social safeguards policies OP 4.10 and 4.12 is provided in the RPF and IPPF of the ESMF.

#### **4 POTENTIAL PROJECT IMPACTS FROM RIVER WORKS**

Adverse and positive impact analysis of the Project at the level of framework can be considered using only the limited available general information on the environmental and social situation at the project area of influence and the typical known impacts of suggested project activities. Site specific impacts (during pre-/construction stages as well as operation stage) will be analyzed during the detail design and included in the relevant ESIA and EMPs.

It is expected that dredging process and river training works can influence the water regime in rivers and swamp areas in the wider Ayeyarwady river catchment area. This is not an instantaneous impact but a slow process that will develop slowly over the years after completion of works. As a result of reduced water flow in the lateral branches and minor flooding, the changes in groundwater levels can be expected. This can potentially negatively affect the functioning of wetlands, which are important refuges, hatching grounds and habitats of plants, birds, fish, amphibians and other animals. Therefore, the full ESIA prepared in parallel with the detail design will have to include the results of the hydraulic modeling, including ecological flows, and must be engaged in the selection of the feasible alternatives with least environmental impact based on the modeling results.

Improved navigation transport could produce and increased pressure over resources and land use change just as an improved road does. The full ESIA will consider land use change modeling and provide mitigation initiatives.

The ESIA will also produce mapping of the development initiatives in the Project area of influence in order to enhance development results and avoid duplications (e.g. as part of the Action Plan on Disaster Risk Reduction, the Disaster Preparedness Agency is leading enhanced flood monitoring and forecasting initiatives in townships and flood preparedness plans in the Ayeyarwady basin) as well as to assess any cumulative impacts at the project sites.

## **5 PROJECT SAFEGUARD APPROACH**

The proposed approach for addressing environmental and social issues in the project will include preparation of the following safeguard instruments:

- Environmental and Social Management Framework (ESMF);
- Environmental Impact Assessments (EIAs) and/or Environmental and Social Management Plans (ESMPs), and other safeguard instruments as required (involuntary resettlement plans, indigenous peoples plans, etc) will be prepared for all investments/subprojects that are identified or designed during project implementation and prepared under the PFI subcomponent;,
- Strategic Environmental and Social Assessment (SESA) will be carried out for the basin Master Plan.

### **ESMF**

- The ESMF will be applied to all infrastructure projects that are identified during project implementation and those financed by the PFI subcomponent. The Preparation of Future Investments activity (PFI) will primarily finance feasibility studies, scoping and prioritization of project concepts, surveys and tests, strategic options studies, policy work, and other studies for future water resources infrastructure investments planned by Borrower in the subsequent project phase (i.e., in irrigation, hydropower, navigation, delta management, municipal water supply or wastewater management systems).

The ESMF includes:

- Screening and scoping criteria for individual sub-projects that are identified during project implementation or to be included in the PFIs activities.
- Guidance on project Categorization (A or B) and the definition of the required safeguard work
- A Resettlement Planning Framework for land acquisition and resettlement
- An Indigenous Peoples Planning Framework
- Guidance on:
  - o Terms of Reference for EIA and ESMP for Category A projects
  - o Management of environmental impacts for small construction projects
  - o Terms of Reference for SESA

## EIA/ESMPs

- An EIA and/or ESMP will be prepared for the civil works related to (i) infrastructure navigation works on selected river sections, for which feasibility studies and designs need to be prepared or revised; (ii) construction or rehabilitation of buildings/offices linked to management and operation of water quality and weather forecasting and DMH operation; (iii) installation of river water monitoring stations and other relevant weather and hydrologic observing network stations; and (iv) installation of navigation aids along the selected river sections.

## SESA

- The SESA will be carried out as part of technical assistance activities related to (i) preparation of the Ayeyarwady Integrated River Basin Master Plan and its Strategic Assessment; (ii) technical background studies such as the Ayeyarwady basin groundwater survey; fleet optimization study; and Ayeyarwady river navigation strategy.

Each of the AIRBM project investments, depending on its typology, will include an assessment of the potential social and environmental impacts and a specific Environmental Assessment (EA) tool consistent with Myanmar laws and standards (as applicable) and World Bank Group requirements. Table 3 summarizes the safeguard approach for the project:

**Table 3 AIRBM Project proposed investments – environmental and social safeguard process**

EA Instrument and category	Content according to the OP/BP 4.01 and relevant safeguard policies	AIRBMP Component	Comment
ESIA – Environmental and social impact assessment (category “A”)	<ul style="list-style-type: none"> <li>• Executive summary</li> <li>• Policy, legal, and administrative framework</li> <li>• Project description. Concisely describes the proposed project and its geographic, ecological, social, and temporal context, including any offsite investments that may be required (e.g., dedicated pipelines, access roads, power plants, water supply, housing, and raw material and product storage facilities). Indicates the need for any resettlement plan or indigenous people plan. Normally includes a map showing the project site and the project’s area of influence.</li> <li>• Baseline data. Assesses the dimensions of the study area and describes relevant physical, biological, and socioeconomic conditions, including any changes anticipated before the project commences. Also takes into account current and proposed development activities within the project area but not directly connected to the project. Data should be relevant to decisions about project location, design, operation, or mitigation measures. The section indicates the accuracy, reliability, and sources of the data.</li> <li>• Environmental impacts including cumulative impacts. Predicts and assesses the project’s likely positive and negative impacts, in quantitative terms to the extent possible. Identifies mitigation measures and any residual negative impacts that cannot be mitigated. Explores opportunities for environmental</li> </ul>	<b>Component 3.2.</b> Navigation Improvements works from Mandalay to Yangon	Some preliminary assessments have already been carried out.

EA Instrument and category	Content according to the OP/BP 4.01 and relevant safeguard policies	AIRBMP Component	Comment
	<p>enhancement. Identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions, and specifies topics that do not require further attention.</p> <ul style="list-style-type: none"> <li>• Assessment of social impacts and risks, including potential land acquisition or other involuntary resettlement impacts, screening for the presence of ethnic minorities and if presence is confirmed assessment of adverse impacts, free, prior and informed consultations and identification of measures to ensure culturally appropriate benefits and avoidance or mitigation of adverse impacts.</li> <li>• Analysis of alternatives. Systematically compares feasible alternatives to the proposed project site, technology, design, and operation—including the “without project” situation—in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. For each of the alternatives, quantifies the environmental impacts to the extent possible, and attaches economic values where feasible. States the basis for selecting the particular project design proposed and justifies recommended emission levels and approaches to pollution prevention and abatement.</li> <li>• Environmental and social management plan (ESMP), including resettlement plan and indigenous peoples plan if needed.</li> <li>• Appendixes <ul style="list-style-type: none"> <li>○ List of EA report preparers—individuals and organizations.</li> <li>○ References—written materials both published and unpublished, used in study preparation.</li> <li>○ Record of interagency and consultation meetings, including consultations for obtaining the informed views of the affected people and local nongovernmental organizations (NGOs). The record specifies any means other than consultations (e.g., surveys) that were used to obtain the views of affected groups and local NGOs.</li> <li>○ Tables presenting the relevant data referred to or summarized in the main text.</li> <li>○ List of associated reports (e.g., resettlement plan or indigenous people plan). See ToRs for category A EIA in ESMF Annex 8</li> </ul> </li> </ul>		
ESMP - Environmental and Social Management Plan including ECoPs (category “B”)	<ul style="list-style-type: none"> <li>• Environmental and Social Impacts: identifies and summarizes all anticipated significant adverse environmental impacts (including those involving indigenous peoples or involuntary resettlement). Describes—with technical details—each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate. Estimates any potential environmental and social impacts of these measures; and provides linkage with any other mitigation plans (e.g., for involuntary resettlement, indigenous peoples, or cultural property) required for the project.</li> </ul>	<b>Component 1.1</b> Construction or refurbishment of a National Water Resources Committee (NWRC) Secretariat and Hydro-Informatics Center headquarters	See ESMF Annex 2 for sample ECoPs for small construction works.

EA Instrument and category	Content according to the OP/BP 4.01 and relevant safeguard policies	AIRBMP Component	Comment
	<ul style="list-style-type: none"> <li>Monitoring: provides (a) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and (b) monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.</li> <li>Capacity Development and Training: provides a specific description of institutional arrangements - which is responsible for carrying out the mitigatory and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training). To strengthen environmental and social safeguard management capability in the agencies responsible for implementation, most EMPs cover one or more of the following additional topics: (a) technical assistance programs, (b) procurement of equipment and supplies, and (c) organizational changes.</li> <li>Implementation Schedule and Cost Estimates: For all three aspects (i.e. mitigation, monitoring, and capacity development), the EMP provides (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the EMP. These figures are also integrated into the total project cost tables.</li> <li>Integration of EMP with Project: The Bank expects the plan to be specific in its description of the individual mitigation and monitoring measures and its assignment of institutional responsibilities, and it must be integrated into the project's overall planning, design, budget, and implementation. Such integration is achieved by establishing the EMP within the project so that the plan will receive funding and supervision along with the other components.</li> </ul>	<p>facility;</p> <p><b>Component 2.2</b> the Modernization of Observation Infrastructure, Data Management Systems and Forecasting; reconstruction and refurbishment of DMH offices and facilities; technical modernization of the observation network;</p> <p><b>Component 2.3</b> - expansion of "end-to-end" early warning systems in several small river basins prone to floods and flash floods</p> <p><b>Component 3.3.</b> establishing of Navigation Aids from Mandalay to Yangon focused on the Mandalay – Nyaung Oo section</p>	
SESA – Strategic Environmental and Social Assessment (Category “A”)	<ul style="list-style-type: none"> <li>OP 4.01 defines a SESA as an instrument that describes analytical and participatory approaches that aim to integrate environmental and social considerations into policies, plans and programs and evaluate their inter linkages with economic considerations</li> <li>The Ayeyarwady is home to an extraordinary diversity of cultural communities as well as ecosystems, flora and fauna. To understand the environmental and social dynamics of potential development options in the Ayeyarwady Basin, a SESA will be carried out. A SESA is a tool for including environmental considerations into policies, plans, and programs at the earliest stages of decision-making. SESA extends the application of environmental assessments (EAs) from projects to policies, programs, and plans. Ideally, SESAs</li> </ul>	<b>Component 1.2.</b> Ayeyarwady Integrated River Basin Master Plan	ESMF Annex 3 includes ToR and a process for carrying out the SESA

EA Instrument and category	Content according to the OP/BP 4.01 and relevant safeguard policies	AIRBMP Component	Comment
	<p>are participatory, designed to give voice to those affected. This SESA will be undertaken early in project implementation to inform the preparation of the Master Plan (1.2.a), for example by highlighting areas of the basin that is particularly fragile from an environmental or social perspective. In addition, the information generated in the SESA process will be captured in the DSS to ensure its integration in future planning and monitoring activities. See ToRs for SESA in ESMF Annex 3</p>		
Environmental and Social Management Framework ( “A” or ”B” investments)	<ul style="list-style-type: none"> <li>• Recognizing that there are a variety of study types with varying degrees of environmental implications it is important that the prefeasibility, feasibility studies and other studies demonstrate an appropriate consideration for promoting environmental objectives, as well as minimizing related risks of future plans, policies and programs. To address environmental issues associated with the desired outcome of the prefeasibility and/or feasibility study, detailed screening and scoping procedures and criteria will be applied to each proposed project leading to detailed ToRs for ESIA’s that will be included in project preparation..</li> <li>• Assessment of social impacts and risks, including triggering of OP 4.10 and/or OP 4.12, for PFI subcomponent activities. Required instruments (e.g. resettlement plan and indigenous peoples plan) will be prepared.</li> </ul>	<p><b>Component 1.3</b> -PFIs - Pre-feasibility studies, technical studies etc. <b>Component 1.2.</b> - Ayeyarwady Basin Groundwater Survey <b>Component 2.2</b> – Design and pilot operation of surface water quality monitoring system <b>Component 3.1</b> – Ayeyarwady River Navigation Strategy (Mandalay to Yangon)</p>	<p>The ESMF process for PFIs subcomponent is presented in Chapter 4.  Resettlement Framework in Annex 6  Indigenous Peoples Framework in Annex 7</p>

## **6 INSTITUTIONAL ARRANGEMENTS AND CAPACITY BUILDING FOR ESMF IMPLEMENTATION**

### **ESMF Implementation Arrangements**

The implementation of the Environmental and Social Management Framework, Environmental Management Plan, Resettlement Policy Framework and Indigenous Peoples Planning Framework will be the responsibility of the Borrower/DWIR and project designer (in the planning phase); the Executors of

civil works and supervision works (in the construction phase), and the Manager(s) of Ayeyarwady River System (in the implementation phase).

Stakeholder involvement is an important element of the overall Environmental and Social Assessment process for the AIRBM Project, as stakeholder identification and analysis at an early stage of a project is critical in the assessment of interests, concerns, relationships, assumptions, their level of influence and the ways in which they affect project risks. Stakeholder identification and engagement commenced during project conceptualization and will continue throughout the ESIA and SESA development.

Effective implementation of the ESMF will require technical capacity in the human resources of implementing institutions as well as logistical facilitation. Implementers need to understand inherent social and environmental issues and values and be able to clearly identify them during project implementation.

Sufficient understanding of the mechanisms for implementing the ESMF will need to be provided to the various stakeholders implementing the AIRBM investments. This will be important to support each CMPU and appreciate their role in providing supervision, monitoring and evaluation including environmental and social reporting on the projects activities. The scheme including the project implementation arrangements is presented in Figure 1.

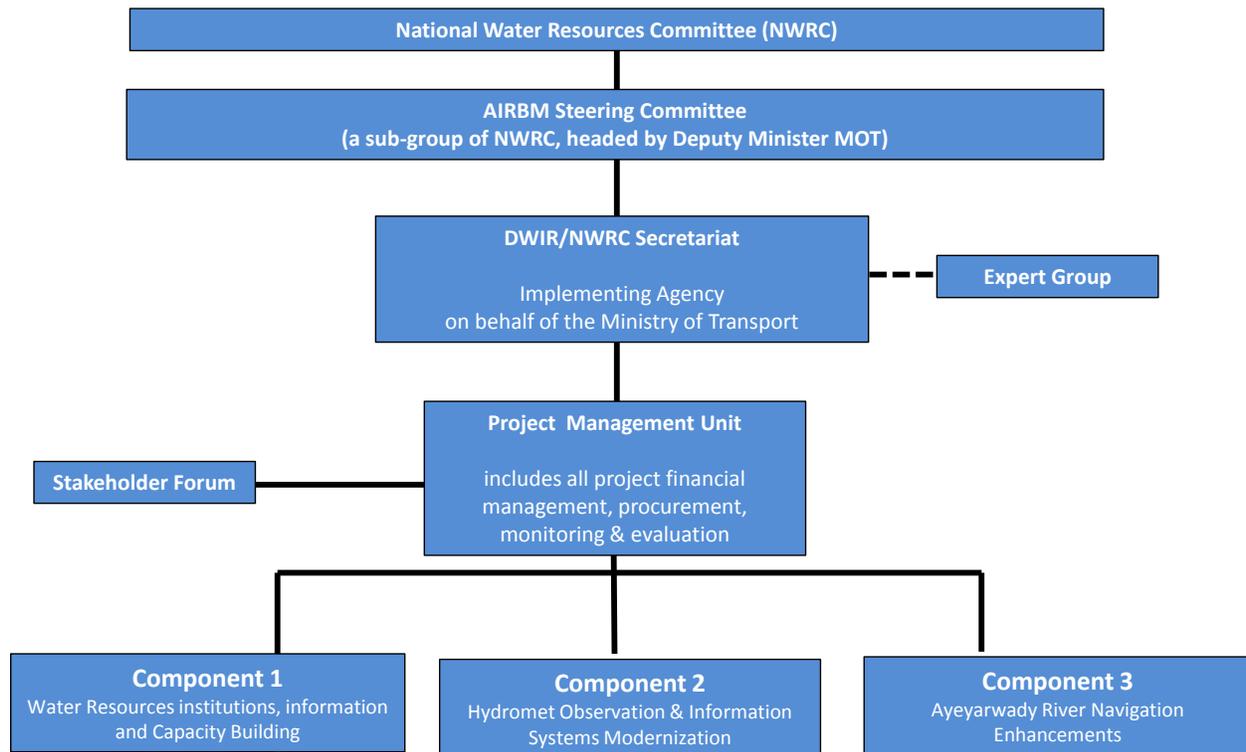
### **Capacity Building for ESMF Implementation**

In order to ensure that there is adequate capacity to implement and monitor the ESMF provisions, environmental and social specialists/expertise will be appointed by PDU as part of each of the three CMPUs.

This expertise and capacity building will contribute to the objectives of the Project, and will include, among other specific tasks:

- Preparing, together with the implementing entities, annual work programs and budgets linked to ESMPs;
- Monitoring project progress as it relates to compliance with the ESMF guidelines, resolving implementation bottlenecks, and ensuring that overall project implementation proceeds smoothly;
- Collecting and managing information relevant to the project and accounts (i.e., environmental and social monitoring and audit reports);
- Ensuring that the implementing bodies are supported adequately and that they adhere to the principles of the project, specific to compliance with the ESMF guidelines; and
- Responsible for the organization and provision of training sessions, including a training plan and its modules, in environmental screening and environmental management and similarly training is also needed for involuntary resettlement and indigenous peoples safeguard policies for field supervision staff, and community representatives to familiarize them with the principles and procedures as set out in the ESMF (this could be applicable to PFI activities as well).

**Figure 1 – The AIRBM project implementation arrangements**



## **7 PROJECT PUBLIC CONSULTATION PROCESS**

Public consultations are ongoing on the project. A first round of public consultations on the AIRBM was carried out by the DWIR May 16 and 19, 2014 in Mandalay and Yangon, respectively. Participants included CSOs, local NGOs, International NGOs, and the River Users’ Association, researchers, private sector and the media. The main objectives of the consultations were to (a) provide background information on the proposed AIRBM, (b) obtain feedback on the scope of work of the draft Environmental and Social Management Framework (ESMF) Terms of Reference (TOR), (c) discuss ways to maximize benefits from the proposed Project, and (d) discuss ways to improve the Project consultation processes. The documents used for consultation included the Myanmar and English versions of Project Information Document (PID), Integrated Safeguard Data Sheet (ISDS), and the draft Environmental and Social Management Framework (ESMF) terms of reference.

Invitations were issued and documents were circulated and posted on the Directorate of Water Resources and Improvement of River Systems (DWIR) website [www.DWIR.coffeecup.com](http://www.DWIR.coffeecup.com), in both English and Myanmar language two weeks before the meetings. All the meetings were led by the AIRBM Project Director, U Sein Tun. The sessions were conducted in both English and Myanmar language with some simultaneous translation provided. Overall, the consultations were well attended, informative and constructive. The participants highlighted important issues for attention, provided the team with valuable

information, and confirmed the need and value of improving the country's capacity to better plan and manage the Ayeyarwady River.

Another round of public consultations will take place on the ESMF shortly. Therefore, this Executive Summary and the ESMF will be revised and updated with any information brought up and discussed by stakeholders that would improve the project design and the sustainable implementation of the project investments. Public consultations will continue and be expanded on specific activities as identified in ESMF during project implementation.